

ISSN[ONLINE] : 2643-9875

ISSN[PRINT] : 2643-9840

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# INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

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**VOLUME 05 ISSUE 08  
AUGUST 2022**

**SJIF IMPACT  
FACTOR : 6.261**

**IJMRA ASI  
SCORE : 04**

**CROSSREF DOI  
10.47191/IJMRA**

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**International Journal of Multidisciplinary Research and Analysis**  
**ISSN[Online] : 2643-9875 || ISSN[Print] : 2643-9840**

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## Constructing a Culinary Tourism Recommendation System Based in Palembang, Indonesian Using Weighted Product Method



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**ABSTRACT:** Based on the survey that conducted on 33 respondents from the Palembang peoples and non-Palembang peoples, got the result that state, most respondents state they had trouble to deciding which restaurant to go to when visiting Palembang and most respondents need 20 to 60 minutes to determine which restaurant that they want to order the food in Palembang area. Therefore, this study will construct a restaurant recommendation system based on the Palembang region and implementing the Weighted Product method and also adding window maps features. This study aims to assist Palembang and non-Palembang users to choosing system-recommended restaurants in Palembang. The result of this study shows that the recommendation system has successful outcomes in helping the users with great overall feedback showing a high satisfaction level of 89.93%.

**KEYWORDS:** Filter, Palembang, Recommendation system, Weighted Product.

### I. INTRODUCTION

The Indonesian nation is a nation that has a lot of diversity. both in terms of customs, culture, religion, ethnicity, and language so that the state of Indonesia is a country rich in natural resources, one of the wealth In the culinary arts, there are various types and uniqueness that are different in each the area in it, ranging from street food, cafes, and even restaurants traditional methods that have different processing and presentation methods in every area [1]. One of the areas that are in the spotlight related to culinary is culinary delights that come from the area of South Sumatra, one of which is pumped which characterizes typical food that mushroomed in the capital and remote areas of the country [2]. One of the main destinations for culinary tourism in the South Sumatra area in Palembang, as evidenced by several large events such as the Sea Games in 2011 and the Asian Games in 2018. Palembang has a rich history strong and is one of the oldest cities in Indonesia and is reflected in the many historical culinary delights in Palembang such as pempek, tekwan, pindang, martabak har, and celor noodles [3].

The current phenomenon is the number of people who become food vloggers to visit the many places to eat in every area in Indonesia as well as many restaurants that endorse influencers to promote hidden and little-known foods to many people [4]. This happens because many people are confused about determining the food they want to consume or the location of the culinary tour that they want to eat want to be tasted, especially newcomers who come to the area [5]. In choosing a restaurant according to your wishes, you tend to spend more time, even more so, the variety of people's tastes have different points of view on culinary to find a restaurant as desired [6]. With these problems, a consumer will feel confused and have doubts about choosing a restaurant appropriate and on the tastes of these consumers, each consumer has different tastes and levels of satisfaction [7], [8]. Consumer satisfaction is the level of consumer feeling after comparing what he accepts and hopes. This sense of satisfaction is the goal of consumers in consuming food so that if consumers do not get it according to their tastes, consumers tend to be dissatisfied or even disappointed with the food in consumption.

According to a survey that has been conducted on 33 respondents, whether people from Palembang, not Palembang people, nor people who had visited Palembang, from the result survey, it can be conclude that there are still many people who are still confused in choosing a restaurant and it takes a long time to choose a restaurant. The average time needed to vote for the restaurant is about 20 minutes to 1 hour and that time is classified as long. So that most of the people who have been observed feel that it is important to create a food recommendation system so that it can help people in thinking and look for a restaurant to be faster [9]. So that it can be implemented into a restaurant choice recommendation system to help consumers choose based on what they want. Criteria used are taken based on observations of 33 respondents to determine what criteria are used when you want to choose a house eat. The results of the criteria consisting of price, rating, location, and operating hours obtained from

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a survey of 33 respondents, the results of the observations are in the attachment. The uniqueness of this research is the existence of window maps that directly shows the location of the restaurant.

The solution that can be applied is a recommendation system choice for culinary tourism, this system uses the Weighted Product method because it has a more detailed calculation due to alternative calculations the best is obtained by multiplying the value of the performance rating and then raising it to a rank with the weight value that has been fixed. The purpose of this research is to design and build a culinary recommendation system for the Palembang area with the Weighted Product method and measure the level of user acceptance of the application that has been made with the End User Computing Satisfaction (EUCS) method.

## II. STUDY LITERATURE

This section will explain the research methodology that is used in this research, the algorithms that will be used, study literature, and will also explain the system design that is chosen to fulfil the research objectives. Recommendations are a way to help people with a lack of knowledge to make some decisions that can be trusted. And a recommendation system is a system that can be used to inform and convince the user to make choices against period. The decision support system with the Weighted Product Method is a computerized program used for assessment, determination, and actions taken by a business using multiple attributes decision making [10]. There are alternative decisions to be taken as well as criteria for alternative decisions or attributes to determine the best choice [11], this decision-making technique is done by selecting attributes, goals, and objectives for different purposes [12]. This is where these different attributes, goals, and objectives are considered to be a criterion, the criteria include size, rules, and standards that will guide the process of making a decision [13].

The Decision Support System itself is composed of three related components, a language system (a mechanism for providing communication between users and other Decision Support System components) [14], a knowledge system (a repository of knowledge about problems contained in a Decision Support System or as a data or a procedure) and a problem processing system (a relationship between two other components, consisting of one or more capabilities in manipulating general problems needed in making a decision) [15]. The decision support system collects data to be analyzed so as that produce comprehensive reports. DSS is also a system that interactive and computer-based tools that assist users in assessing and making decisions about something and building a model and running the program also calls the source of information for making a decision [16]. The decision support system collects data to be analyzed so as that produce comprehensive reports. DSS is also a system that interactive and computer-based tools that assist users in assessing and making decisions about something and building a model and running the program also calls the source of information for making a decision there are several formulas used in the Weighted Product, namely:

The formula for calculating the weights to obtain the weights:

$$W_j = \frac{w_j}{\sum_{j=1}^n w_j} \quad (1)$$

Formula vector Si:

$$S_i = \prod_{j=1}^n X_{ij}^{W_j} \quad (2)$$

Formula vector V:

$$v_i = \frac{S_i}{S_1+S_2+S_3+\dots+S_n} \text{ dengan } i = 1, 2, 3, \dots, n \quad v_i = \frac{S_i}{S_1+S_2+S_3+\dots+S_n} \quad (3)$$

End-User Computing Satisfaction (EUCS) is a method for measuring the level of satisfaction of users of an application system by comparing expectations and the reality of an information system-User Computing Satisfaction was first coined by Torkzaadeh and Doll. The definition of End User Computing Satisfaction from an information system is the overall evaluation of users of information systems based on their experience in using the system.

Evaluation using the model in Fig 1 emphasizes end-user satisfaction with the technology aspect, by assessing content, accuracy, format, timing, and ease of use of the system. This model has been tested by many other researchers to test its reliability [10]. In this study, the Likert scale was used as a guide for interpretation. Scale Likert is a research scale used to measure attitudes and opinions. This scale is used to complete a questionnaire that requires respondents to indicate the level of agreement on a series of questions. Level The agreement in question is a Likert scale of 1-5 choices, with a gradation of Strongly Agree (SS) to Strongly Disagree (STS).

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## III. METHODOLOGY

The system design stage is carried out by designing the flowchart, database system and mockup system that will be used when creating the recommendation system, as well as what features can be done by the recommendation system so that this stage is the beginning to make the system so that the system made becomes clearer and more focused. A flowchart shows the flow or flow and the relationship between the processes of a program logically and procedurally. The main flowchart that shown culinary tourism recommendation system process can be seen at Figure 1 and Figure 2.

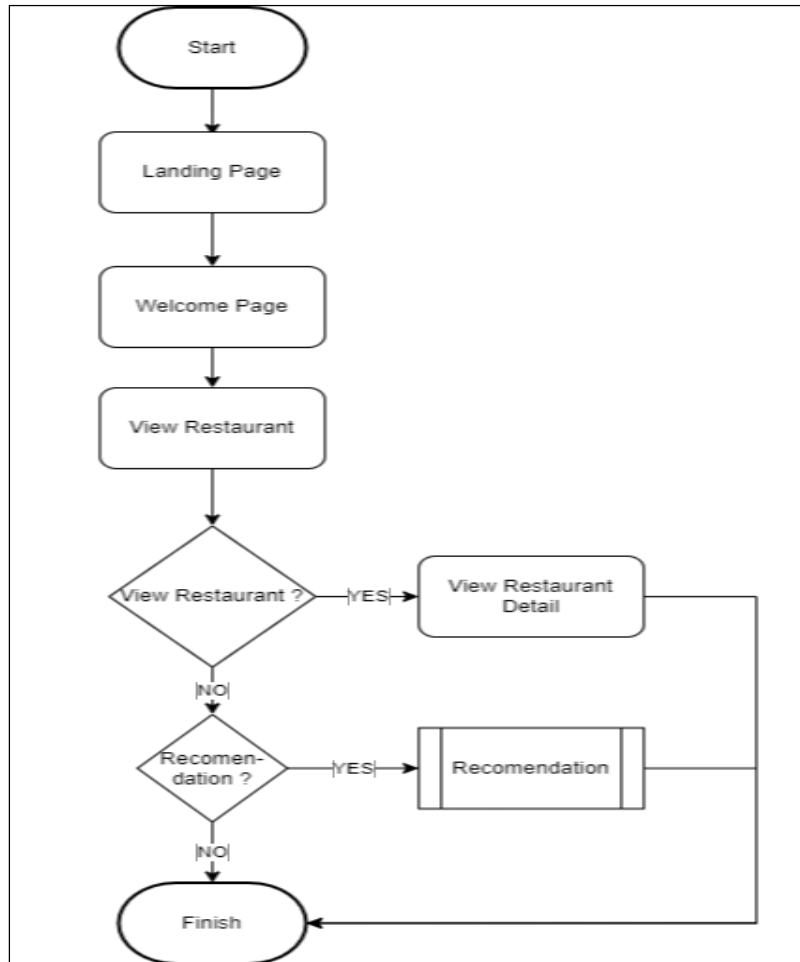


Fig. 1. Flowchart Website Payo Makan Recommendation System

Figure 1 is a flowchart of the existing recommendation system on the user side, it can be seen that the user will be redirected to the landing page and then will enter into the welcome page, after that it will go directly to the main page namely the restaurant page and can choose several other pages such as restaurant detail page and recommendation which contains the calculation process.



# Constructing a Culinary Tourism Recommendation System Based in Palembang, Indonesian Using Weighted Product Method

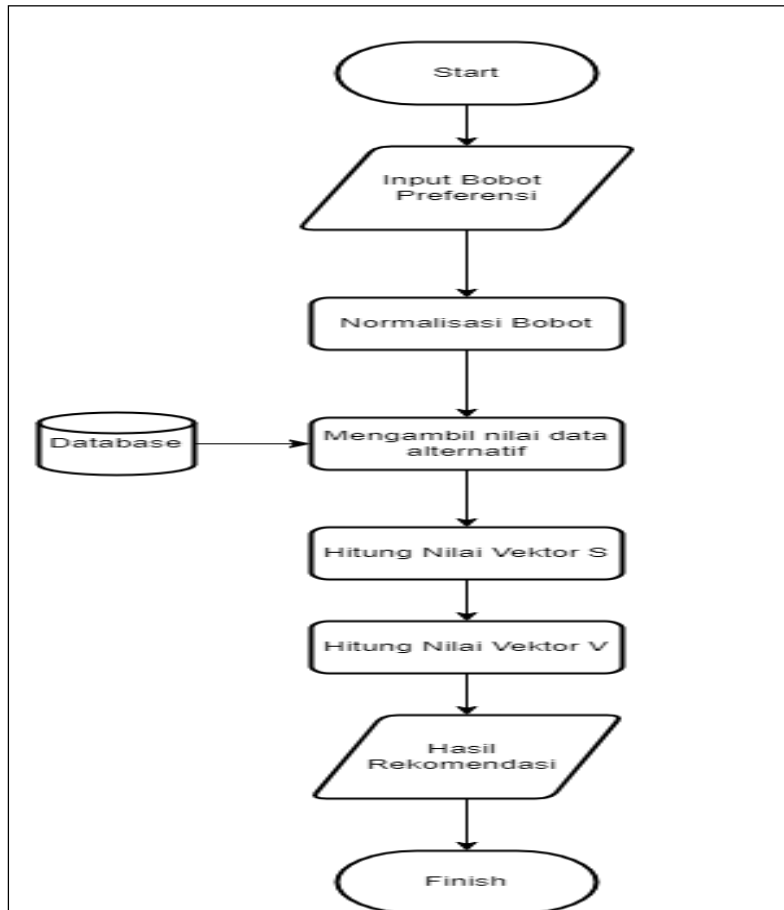


Fig. 2. Weighted product flowchart process

Figure 2 shown flowchart of the recommendation calculation process, first, the system will get the preference weight from the user input then the weight obtained will be normalized after that take alternative data for each criterion after that calculate the value of S and V then the results of the recommendations that have been calculated with the formula will appear.

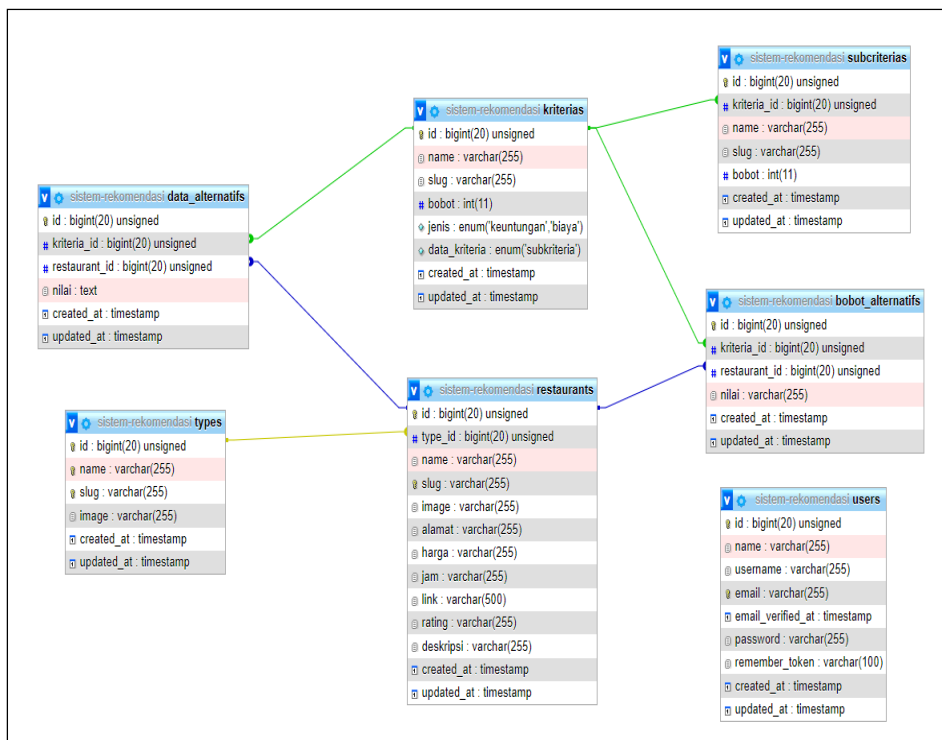


Fig. 3. Entity Relation Diagram Payo Makan recommendation System

## Constructing a Culinary Tourism Recommendation System Based in Palembang, Indonesian Using Weighted Product Method

Figure 3 shown a relation between tables in database for system “Payo Makan” recommendation system, there are seven data tables used in building the “Payo Makan” website, and there are six tables that have a relationship between tables including alternative data tables with criteria having one relationship to many, where one criterion has many alternative data, then the table alternative data with the restaurant’s table has a one to many relationships where one restaurant has a lot of alternative data, then the criteria table with sub-criteria have a one to many relationships where one criterion has many sub-criteria, then the criteria table and alternative weights have a one-to-many relationship that where one criterion has many alternative weights and the restaurant table with The alternative weights have a one-to-many relationship where one restaurant has many alternative weights, then for table type with table restaurants have a one-to-many relationship where the type is owned by many restaurants, while for user table stands alone and has no relation with other tables.

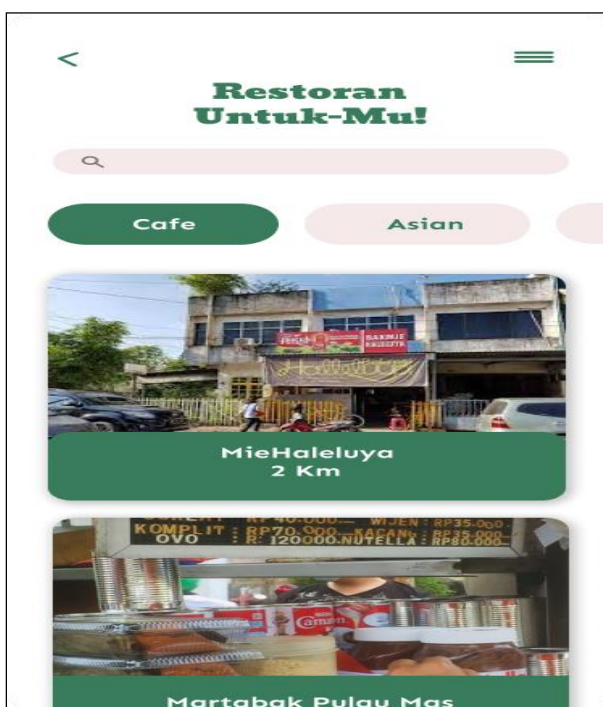


Fig. 4. Main page mock-up

Figure 4 shown the initial design of the main page, this page consists of one navbar containing navigation to another page, a search box that allows users to search for specific restaurants by keywords, a category slider that contains a list of categories, as well as a list of restaurants that there is.



Fig. 5. Recommendation page muck-up

## Constructing a Culinary Tourism Recommendation System Based in Palembang, Indonesian Using Weighted Product Method

Figure 5 is the initial design of the recommendation page, this page contains a form consisting of four existing criteria consisting of price, location, distance, and hours of operation. Each criterion has a select value that consists of options that will determine the initial weight to be used in the calculation to produce a sequence of restaurant recommendations according to the method used.



Fig. 6. Recommendation result page mock-up

Figure 6 shown the initial design of the recommendation results page. This pages contains a list of restaurants that have gone through the calculation process and are sorted from the best according to the calculation results

### IV. IMPLEMENTATION

Implementation is done using the Laravel framework using the PHP programming language, here is a snippet of the implementation results and the code used in this system. Mockup that shown in Figure4 implemented into system recommendation, where in the main page containing the navbar, category list, and list of existing restaurants. In the navbar, several options can be directed to the page that is home, restaurant, and recommendations. Under The navbar has a search column that is useful for finding restaurants with certain keywords, after that there is a choice of sliders from each existing category, then below it, there is a list of restaurants which are divided into 10 per page.

Mockup that shown in Figure5 implemented into system, where in this page user can selects a recommendation. On this page, there is a form consisting of four existing criteria, namely price, rating, location, and hours of operation. In each criterion, the user can determine weights by selecting the options in the form of very unimportant, unimportant, mediocre, important, and very important that will determine the results of the recommendations obtained. Mockup that shown in Figure6 implemented into recommendation system, where on this page, the results of the culinary recommendation system that using weighted product will be displayed based on the category choices the user has selected on the previous page.

After implemented Weighted Product method in recommendation system and a web application with the following specifications. Table 1 to Table 4 shown the calculation steps performed using the Weighted Product method. The calculation is done by normalizing the weight of the criteria that have been determined and then it will be raised to the power of each restaurant data from each of the known criteria as vector  $s$  then each vector  $s$  result will be divided by the total vector  $s$  which becomes vector  $v$  and sorted from the largest value.

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**Table I. Restaurant Data**

Restaurant	Criteria			
Name	C1	C2	C3	C4
RM Nusantara	51.140	4.7	2.9	12.5
Bakmi Alun	41.900	4.7	3	14
Kopitiam	54.858	4.7	4.3	13.5
Sarinande	42.440	4.6	3.1	11
Kampung Kecil	44.000	4.6	4.8	12

Before performing calculations, the first step that must be done is to determine the initial weight which will be determined by the user as a determinant of the final calculation result. For this trial calculation, the weight of each criterion will be used as shown in Table 1.

**Table II. Criteria Weight**

No	Name	Score
C1	Price	3
C2	Rating	5
C3	Location	3
C4	Time	3

After determining the weight of each criterion, a normalization process will be carried out from the weights obtained by dividing each weight by the total weight of each criterion as shown in Table 2.

**Table III. Criteria Normalization**

No	W	Result
C1	$3/(3+5+3+3)$	-0.214
C2	$5/(3+5+3+3)$	0.357
C3	$3/(3+5+3+3)$	-0.214
C4	$3/(3+5+3+3)$	0.214

Table 3 is a determination for the weight of the criteria that is cost will be multiplied by -1 while for the profit it will be multiplied by 1 so that the weight of price and location is multiplied by -1.

**Table IV. Vector S calculation for each data**

No	Calculation	Result
S1	$(51140^{-0.214})(4.7^{0.357})(2.9^{-0.214})(12.5^{0.214})$	0.233
S2	$(41900^{-0.214})(4.7^{0.357})(3^{-0.214})(14^{0.214})$	0.247
S3	$(54858^{-0.214})(4.7^{0.357})(4.3^{-0.214})(13.5^{0.214})$	0.214
S4	$(42440^{-0.214})(4.6^{0.357})(3.1^{-0.214})(11^{0.214})$	0.231
S5	$(44000^{-0.214})(4.6^{0.357})(4.8^{-0.214})(12^{0.214})$	0.212

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Table 4 is the process of calculating vector  $s$  by multiplying each alternative data for each criterion and each alternative data to be multiplied will be raised first with the normalized value of the criterion weight.

**Table V. Vector V calculation for each data**

No	Name	Score
V1	0.2333/1.137	0.205
V2	0.247/1.137	0.217
V3	0.214/1.137	0.188
V4	0.231/1.137	0.203
V5	0.212/1.137	0.187

Table 5 is a process for calculating vector  $v$  by dividing each vector  $s$  by the total number of vectors available.

**Table VI. Ranking of the results of the vector  $v$**

No	Name	Score
V2	Bakmi Alun	0.217
V1	RM Nusantara	0.205
V4	Sarinande	0.203
V3	Kopitiam	0.188
V5	Kampung Kecil	0.187

Table 6 is the final result of the vector  $v$  calculation sorted from the largest to the smallest results.

## V. EVALUATION AND RESULT

User acceptance of this recommendation system has been successfully obtained, user satisfaction is measured by distributing questionnaires form to get feedback from users. 40 user respondents have answered the survey, the survey is carried out using the End User Computing Satisfaction (EUCS) method. The user satisfaction test has five aspects that are used as measurement indicators, namely content, accuracy, format, ease of use, and timeliness. So that the questions that will be made are based on these five aspects, the following is a list of questions that will be distributed based on the EUCS concept. The following is the list of question that grouping by category.

### 1. Content

- The information content of the Payo Makan website provides information according to your needs?
- The content of the Payo Makan website information is easy to understand?
- Is the information on the Payo Makan website complete enough?
- The content of the Payo Makan website information is very clear?

### 2. Accuracy

- The Payo Makan Recommendation System has produced true and accurate information?
- Each link in the Payo Makan recommendation system already displays the appropriate page?

### 3. Format

- The display design of the Payo Makan recommendation system has an attractive color setting?
- The display design of the Payo Makan recommendation system has a layout that makes it easy for users?
- The display design of the Payo Makan recommendation system has a menu structure and links that are easy to understand?

### 4. Ease of Use

- Is the Payo Makan website very easy to use?
- Is the Payo Makan website easy to access from anywhere and anytime?

### 5. Punctuality

- Information about the restaurant you need quickly obtained through the Payo Makan recommendation system?
- Payo Makan's Web recommendation system displays up-to-date information?

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A total of 40 respondents have used the system and answered the survey. After the survey results are obtained, the results can be calculated using the Likert scale formula to get the percentage score for this recommendation system, Table VII shown the results of calculating the percentage score.

Table VII. Skor hasil survey aspek konten

Content Aspect					
Question	Answer				
No	STS	TS	N	S	SS
1	0	0	2	11	27
2	0	0	3	9	28
3	0	0	3	21	16
4	0	0	3	15	22
Score Total	0	0	11	54	93

The following is calculation for content aspect based on Table VII, where the score total will calculate based on weight, where weight of SS is 5, weight of S is 4, weight of N is 3, weight of TS is 2 and weight of STS is 1. From that weighted, will get the final score result is 714. Percentage of content aspect will be divide by highest score and calculate by percentage, and from the calculation, will get 89.25% result. Based on the survey results for the content section there are 4 representative questions, as many as 93 answered strongly agree, 54 answered agree, 11 answered neutral, 0 answered disagreed, 0 answered strongly disagree. So that after the calculation, the results obtained as much as 89.25% which indicates that the respondents agree that the Payo Makan recommendation system has fulfilled the content aspect. And for results satisfaction that has been calculated obtained is 89.93% which is categorized as very good.

### VI. CONCLUSION

The restaurant recommendation system in Palembang using the Weighted Product method has been successfully designed and created, the system recommendations for calculating according to the stages of the Weighted Product method by taking the user preference weight value. The finished system Experiments have also been carried out by comparing the results of calculations system with manual calculation results, the results obtained have matched well manual or in the system so that it can be concluded the system that has been built has been successful and as expected. For future research, there is several additional suggestions are provided as follows: First, the UI/UX appearance of the system can be improved and made more colourful so that the display becomes even more attractive and nice. And restaurant data should be added, so that there is a lot choices and variety. And the last should be added several features such as a food review column, the best menu on the website for each restaurant to make this culinary recommendation system more interesting and varied.

### ACKNOWLEDGMENT

Thank you to the Universitas Multimedia Nusantara, Indonesia which has become a place for researchers to develop this journal research. Hopefully, this research can make a major contribution to the advancement of technology in Indonesia.

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## Examine Trade Facilitation Effects on Foreign Investment in Vietnam's Economic Sectors



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**ABSTRACT:** Foreign direct investment (FDI) is seen as a key element in fostering economic growth during the process of economic integration. Investors' investment decisions may be influenced by a variety of issues, including the discomfort brought on by lengthy Customs clearance processes, a lack of management transparency, or the challenge of delivering commodities. This study's primary goal is to determine whether trade facilitation (TF) throughout the years 2007 to 2019 played a role in luring foreign direct investment to Vietnam. Three components make up the TF impact: the infrastructure effect, the institutional effect, and the customs effect. According to the findings, enhancing these outcomes will boost FDI inflows into Vietnam's economic sectors. The cost and time spent processing the clearance documents serve as a proxy for the TF effect in the robustness check. The results are in line with early predictions that TF reforms may boost FDI inflows. Trade is made easier by reducing the time and expense of importing and exporting. FDI flows have expanded over time as a result of this making Vietnam's business environment more appealing.

**KEYWORDS:** Foreign direct investment; System Generalized Method of moments; trade facilitation

### I. INTRODUCTION

The foreign-invested economic sector has grown to be a significant portion of Vietnam's economy through the process of economic integration. A nation's economic development is seen to be significantly influenced by foreign direct investment (FDI). Numerous earlier studies have shown the economic advantages of FDI. It fosters economic expansion (Harris & Robinson, 2003; Makki & Somwaru, 2004; Oliva & Rivera-Batiz, 2002), and increases employment prospects for employees (Duval & Utoktham, 2014b; Varblane et al., 2005). Additionally, FDI serves as an intermediary conduit for innovation and technology transfer (Asiedu, 2002, 2006; Bodman & Le, 2013; Demena & van Bergeijk, 2019; Osano & Koine, 2016; Sapkota & Bastola, 2017); and encourages productivity spillovers (Demena & Murshed, 2018; Demena & van Bergeijk, 2017). Given that the majority of developing nations have lesser levels of science and technology than industrialized nations and that the majority of new technologies are developed mostly in industrialized nations, this is a crucial element in the allure of FDI. Therefore, developing nations must quickly gain access to new technology if they are to close the gap and catch up with industrialized nations. Additionally, FDI is a tool for businesses to enter these nations with direct production as trade protectionism becomes more prevalent globally (Chen & Moore, 2010). It follows that the government's efforts to improve the economic and political climate in order to draw these investment flows are not surprising. The availability of a nation also frequently determines the destination of FDI. Resources, host nation policies, market size, trade costs, administrative transparency, and other elements are among these (Ibrahim & Ajide, 2022). Recent research contradicts the widespread belief that increasing FDI would result in issues like environmental damage. Demena and Afesorgbor (2020) specifically examined how FDI affects emissions into the environment. According to the study, FDI has no effect on greenhouse gas emissions. However, the authors also demonstrated that the impact varies for nations with varying levels of development.

Trade facilitation (TF) is a set of actions aimed at streamlining customs clearance paperwork, improving management transparency, and accelerating and simplifying the movement of products. As a result, it has often been demonstrated that the impacts of TF have various welfare implications (Go, 2018; Hillberry & Zhang, 2015; Ibrahim & Ajide, 2022; Jordaan, 2014; Nizeyimana & De-Wuft, 2015; Paulo et al., 2015; Sakyi et al., 2017). Numerous studies have shown that the first advantage is the decrease in transaction costs as a result of the procedure's simplicity, which also results in a decrease in transaction time

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(Hillberry & Zhang, 2015; Moisé et al., 2011; Moisé & Sorescu, 2013; Nizeyimana & De-Wuft, 2015; Sakyi et al., 2017). This is one of the crucial elements that aids companies in boosting cross-border transaction volumes (Jordaan, 2014; Yu & Luu, 2020). The fact that TF considerably lowers the non-trade barriers and dangers that firms usually encounter when conducting cross-border transactions is another advantage that has also been shown in numerous studies. (Go, 2018; Hillberry & Zhang, 2015; Nizeyimana & De-Wuft, 2015). Countries become more appealing when their trading environment is better, which in turn draws more foreign investors (Ibrahim & Ajide, 2022). Most importantly, this development also strengthens a developed nation's economy (Paulo et al., 2015; Sakyi et al., 2017).

The convenience and ease of cross-border commerce in goods is seen as a key factor for nations striving to make the shift to a higher-value manufacturing structure. Global value chain-based manufacturing can lead to economic gains and job prospects. For emerging nations like Vietnam, FDI is the fastest route to joining the global value chain. Therefore, encouraging FDI into Vietnam is crucial for the country's future development and the attainment of the sustainable development goals.

Duval and Utoktham (2014) use FDI data associated with TF indicators for developing economies to analyze the effect of TF on FDI flows and take into account the effect of lowering trade costs. The findings demonstrate that while reductions in tariffs will only enhance FDI flows by 6% to 7%, and lower trade costs could result in a 20% rise in FDI inflows, strengthening the business environment of these sample nations can raise FDI inflows by 60%. Consequently, our research demonstrates that TF is crucial for boosting FDI. Chimilila et al. (2014) take the East African Community's TF into consideration. The authors demonstrate that raising TF aids in boosting FDI inflows into these nations' communities using a descriptive research design using secondary data. FDI and the TF index are positively correlated, but this link is not statistically significant. The paper also identifies challenges to enhancing TF, such as inadequate non-tariff barriers, inadequate infrastructure, a shortage of highly skilled labor, etc. The influence of doing business indicator on sub-African direct investment flows in Africa was studied by Nangpiire et al. (2018) using a dataset of 44 African nations. The findings indicate a strong correlation between increased TF and FDI inflows to these nations. Similar to this, Ibrahim and Ajide (2022) discovered that TF severely hampered FDI flows to Africa by using days and cost data on imports and exports of 26 African nations for the period 2004 to 2014.

In this study, the effect of TF on 18 economic sectors in Vietnam from 2007 to 2019 is evaluated. This study's major goal is to determine whether TF plays a role in luring foreign direct investment to Vietnam. Three components make up the TF impact: the infrastructure effect, the institutional effect, and the customs effect. Empirical findings using the System Generalized Method of Moments (SGMM) estimator show that enhancing these effects raises FDI inflows to Vietnam's economic sectors. With the hope that decreasing prices and hours will result in an increase in FDI inflows into Vietnam, we utilize the cost and hours necessary to import and export as a proxy for customs effects, infrastructural effects, and institutional effects. They were discovered to satisfy this assumption while also demonstrating how trade is made simpler by the decrease in import and export labor requirements and expenses. Due to this, Vietnam's business climate has become more appealing, which has led to a rise in FDI inflows over time.

The rest of this study's findings are laid out as follows: The estimation methodology and data used in this study's model are presented in Section 2. The results are presented and discussed in Section 3 of the paper. Conclusions and suggestions are in Section 4s.

## II. METHODOLOGY AND DATA

### A. Estimation Strategy

Several factors stand out when it comes to the theoretical foundations of the incentives that influence foreign investors' positioning choices. Some arguments are regionally specific, while others are universal. But for this investigation, the driving forces of FDI were carefully selected as being common in the literature. In addition to being qualitative, these traits are the focus of FDI study for developing countries (Ibrahim & Ajide, 2022). The impact of TF on FDI inflows to Vietnam's economic sectors is calculated using the formula below:

$$FDII_{it} = \beta_0 + \beta_1 Institutions_{it} + \beta_2 Infrastructure_{it} + \beta_3 Customs_{it} + \beta_4 INF_{it} + \beta_5 GDP_{it} + \beta_6 DCF_{it} + \beta_7 Trade_{it} + \beta_8 POP_{it} + \varepsilon_{it} \quad (1)$$

Where  $i$  is the economic sector and  $t$  denotes the time,  $i = 1, \dots, 18$  and  $t = 2007, \dots, 2019$  respectively. 18 economic factors from 2007 to 2019 are used in this study. Due of the comprehensiveness of the data, this study period was selected. Vietnam has the opportunity to sign bilateral and multilateral trade agreements thanks to its 2007 WTO membership, which is a factor that Vietnam must vigorously implement TF. The sample used for this study's evaluation spans the years 2007 through 2019. Foreign direct investment inflow is referred to as  $FDII$ . TF is the enhancement of administrative processes, infrastructural quality, and customs procedures, among other things. It all comes down to fostering a positive work environment. In order to analyze the influence of TF, this study uses three aspects. It consists of structures, practices, and institutions.  $INF$ ,  $GDP$ ,  $DCF$ ,  $Trade$ , and  $POP$

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are among the model's control variables. *INF*, or inflation, is regarded as a metric for assessing the macroeconomic instability of Vietnam. The price changes of various commodities and services are used to gauge how stable the economy is. To make Vietnam more appealing and to encourage the influx of foreign direct investment, the economy must be stable. Rising inflation has a detrimental effect on FDI flows, according to recent studies (Ibrahim & Ajide, 2022; Shobande & Lanre, 2018a, 2018b). *GDP* stands for gross domestic product divided by economic sector at current prices. It is employed to assess how FDI inflows are impacted by industry size. This variable is linked to FDI inflows, according to numerous earlier research (Anyanwu, 2012; Ibrahim & Ajide, 2022; Liargovas & Skandalis, 2012). The banking industry offers domestic credit, or *DCF*. Numerous studies have demonstrated that enhancing domestic financing is a factor that can encourage governments to increase investment (Ibrahim et al., 2019; Ibrahim & Ajide, 2022). The second control variable is trade, which is also known as trade openness. Trade openness is measured using the ratio of total imports and exports of products to GDP. The justification for utilizing this variable is based on the tax-jumping hypothesis's supporting evidence. Foreign businesses who want to serve the local market but find it challenging to import goods may opt to set up subsidiaries in the host nation. As trade protectionism raises production costs, reduces exports, and reduces competitiveness, multinational businesses that engage in export-oriented activities may decide to locate in more open economies. *POP*, which stands for population, is the last control variable. Due to the creation of a route for multinational firms to extend the market by offering goods and services, the application of this control variable suggests that the big population size will draw significant inflows of foreign direct investment. The assumption that businesses or multinationals will invest more in nations with big populations results in the finding that FDI and *POP* are positively correlated. This is the model's mistake. According to the report, improvements to Vietnam's institutional, customs, and domestic infrastructure will boost FDI inflows. Vietnam's better business climate increases its allure and strengthens its economy.

The cost and labor hours needed for import and export are used in this study as a stand-in for TF variables as a robustness check. Considering that it is commonly known that nations have consistently sought to streamline the customs clearance procedure as part of their TF reforms. Because it lowers transaction costs, this simplicity is always crucial. Always, transaction cost reductions can result in significant economic gains like facilitating bilateral and global trade flows. The following describes the model used in the robustness test:

$$FDII_{it} = \beta_0 + \beta_1 Im\_cost_{it} + \beta_2 Im\_hours_{it} + \beta_3 Ex\_cost_{it} + \beta_4 Ex\_hours_{it} + \beta_5 INFL_{it} + \beta_6 GDP_{it} + \beta_7 DCF_{it} + \beta_8 Trade_{it} + \beta_9 POP_{it} + \varepsilon_{it} \quad (2)$$

where the import and export expenses are denoted by *Im\_cost* and *Ex\_cost*, respectively. The time frames necessary for importing and exporting items are *Im\_hours* and *Ex\_hour*. From the perspective of the investor, import and export procedures, documentation, and time requirements are crucial elements that influence a product's ability to compete on the global market. This could play a significant role in influencing the choices made by international investors. According to this study, streamlining cross-border transaction processes and lowering associated costs can boost FDI inflow. Table 1 provides information about each variable used in this study.

**Table 1. Variables Details**

Variables	Definition	Source
FDII	Foreign direct investment by economic sectors, net inflows	VGSO
Customs	Customs effect (Based on burden of customs procedures and customs services index)	WB WGI
Infrastructure	Infrastructure effect (Based on quality of overall infrastructure, quality of roads, quality of railroad infrastructure, quality of port infrastructure, and quality of air transport infrastructure)	WEF GCI
Institutions	Institutional effect (Based on control of corruption, government effectiveness, political stability, regulatory quality, and rule of law)	GETR
<i>Im_cost</i>	Cost to import (base on import costs and border compliance; import costs and documentary compliance)	WB DBP
<i>Im_hours</i>	Hours to import (based on import time, border compliance; import time, documentary compliance)	WB DBP
<i>Ex_cost</i>	Cost to export (based on export costs and border compliance; export costs and documentary compliance)	WB DBP
<i>Ex_hours</i>	Hours to export (Based on export time, border compliance; export time,	WB DBP

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	documentary compliance)	
INF	Inflation	VGSO
GDP	Gross domestic product	VGSO
DCF	The domestic credit given by the financial sector	WB WDI
Trade	Trade openness. The ratio between total import and export of goods to GDP.	VGSO
POP	Population	VGSO

Note: VGSO is understood as the General Statistics Office of Vietnam; WB WGI is understood as the World Bank Global Governance Indicator; GETR is the Global Enabling Trade Report; and WB DBP is the World Bank's Doing Business Project.

To get over the potential endogeneity issue in the estimation, this study uses the SGMM estimate. Numerous recent research have used this approach to address endogenous issues (Baklouti & Boujelbene, 2020; Naseem & Tong, 2021; Sakyi et al., 2017, 2018; Yu & Luu, 2020, 2022). The following portion of the study will provide further explanations of the statistics and the data sources used in the calculations.

### B. Data Collection and Analysis

The 18 economic sectors of Vietnam are used in the analysis as an observational model for the years 2007 through 2019. Based on information given by the General Statistics Office of Vietnam, investments in these 18 sectors (VGSO). Institutional, infrastructure, and customs statistics are all included in TF data.

The Global Enabling Trade Report's (GETR) indicator average value for the customs effect includes:

- Burden of Customs procedures
- Customs service index

The global competitiveness index (WEF GCI) database's indicators, which include those listed below, are used to calculate the infrastructure effect as an average value:

- Quality of overall infrastructure
- Quality of roads
- Quality of railroad infrastructure
- Quality of port infrastructure
- Quality of air transport infrastructure

The average value of the metrics offered by the World Bank Global Governance Indicators (WB WGI) database represents institutional effect, including:

- Control of Corruption
- Government Effectiveness
- Political Stability
- Regulatory Quality
- Rule of Law

Prior to being incorporated into the estimate, these indicators will be standardized. The following calculation is used to normalize the data:  $A_i = \frac{a_i - \min(a)}{\max(a) - \min(a)}$  when  $a = 1, \dots, n$

**Table 2. TF Data Description**

Variable	Obs	Mean	Std. Dev.	Min	Max
Burden of customs procedures	234	0.4412	0.3774	0	1
Customs service index	234	0.4633	0.2844	0	1
Quality of overall infrastructure	234	0.4554	0.3771	0	1
Quality of roads	234	0.4881	0.4017	0	1
Quality of railroad infrastructure	234	0.3138	0.3698	0	1
Quality of port infrastructure	234	0.5119	0.3274	0	1
Quality of air transport infrastructure	234	0.5519	0.3771	0	1
Control of corruption	234	0.5753	0.2546	0	1
Government effectiveness	234	0.3605	0.3141	0	1

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Political stability	234	0.5331	0.2407	0	1
Regulatory quality	234	0.5670	0.3579	0	1
Rule of law	234	0.4726	0.3299	0	1

The objective of this normalization is to translate the values of the dataset's numerical columns to a standard scale without changing the range of values. The World Bank's Doing Business Project (WB DBP) database contains information on the price and time needed to import and export commodities. If import and export hours equal the average of import and export hours in border compliance and document compliance, and import and export cost equals the average of import and export costs in border compliance and document compliance. Data from the VGSO are used to calculate consumer inflation, GDP by sector, population, and trade openness. The formula  $\Sigma(Export + Import)/GDP$  is used to calculate trade openness. Data about DCF was gathered from the WB. Before being incorporated into estimates, these numbers are transformed to logarithmic values. Table 3 provides a detailed description of these factors.

**Table 3. Variable Description**

Variable	Obs	Mean	Std. Dev.	Min	Max
FDI	234	6.5489	1.3539	3.9871	10.3315
Customs effect	234	0.9046	0.6140	0.2225	2.0000
infrastructure effect	234	2.3211	1.7498	0.0485	5.0000
Institutional effects	234	2.5086	0.7517	1.2943	3.8989
Overall effect	234	5.7343	2.6982	2.0928	10.1865
GDP	234	25.8763	0.2229	25.5301	26.2496
INFL	234	1.7544	0.7510	0.4601	3.1405
DCF	234	4.6793	0.1590	4.4173	4.9266
TO	234	2.2595	1.3177	0.5833	5.4408
POP	234	5.2360	0.6395	4.0661	6.2991

The next section presents the findings of an empirical model on how institutions, infrastructure, and customs affect FDI inflows into Vietnam's economic sectors, including the baseline and SGMM.

### III. RESULTS AND DISCUSSIONS

The main findings on how the TF implementation affected FDI inflows to Vietnam from 2007 to 2019 are presented in this section. We will first provide the findings of the mechanistic regression for this effect, and then we will present the estimation of the SGMM that was utilized to solve the model's endogeneity issue. The robustness test for this estimate will be completed by substituting other indices for the TF data. The findings are shown in Tables 4 to 7, where Table 4 shows the results of the baseline regression, Tables 5 and 6 provide the outcomes of the SGMM approach, and Table 7 shows the outcomes of the robustness check.

Columns (1) through (4) of Table 4 provide the results of the baseline regression. The results of the customs effect are shown in column (1), the results of the infrastructural effect are shown in column (2), the results of the institutional effect are shown in column (3), and the results of the overall TF effect are shown in column (4). The findings of the initial regression indicate that these effects have a favorable influence on FDI. In particular, improvements in institutional, infrastructure, and customs effects might boost FDI flows by 33.2%, 7.92%, and 25.6%, respectively. When considering the overall effect of TF, the regression results demonstrate similar encouraging indicators.

**Table 4. Baseline Specification**

Variable	(1)	(2)	(3)	(4)
Customs effect	0.322*** (0.0613)			
Infrastructure effect		0.0792*** (0.0151)		



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Institutional effects			0.256*** (0.0488)	
Overall effect				0.0509*** (0.00971)
GDP	18.58*** (2.907)	19.38*** (3.032)	19.80*** (3.100)	19.34*** (3.026)
INFL	-1.821*** (0.308)	-1.798*** (0.305)	-2.126*** (0.356)	-1.867*** (0.315)
DCF	-22.39*** (3.526)	-23.41*** (3.675)	-27.17*** (4.261)	-23.99*** (3.764)
TO	0.247*** (0.0508)	0.164*** (0.0425)	0.139*** (0.0409)	0.172*** (0.0431)
POP	1.436*** (0.275)	1.604*** (0.292)	2.554*** (0.420)	1.766*** (0.310)
Constant	-373.5*** (59.66)	-390.1*** (62.28)	-388.0*** (61.96)	-387.0*** (61.80)
R-Squared	0.981	0.981	0.981	0.981
No. of Obs	234	234	234	234
Fixed Time	Yes	Yes	Yes	Yes
Fixed sector	Yes	Yes	Yes	Yes

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Tables 5 and 6 give the outcomes of the SGMM estimate. The implications of customs and the transportation infrastructure are seen in Table 5. The institutional influence and the overall impact of TF are shown in Table 6. Twelve columns are used to display the results in Table 5. Customs effects are displayed in columns (1) through (6), and transportation infrastructure implications are displayed in columns (7) through (12). The coefficients found in this study are statistically significant at the 1% level when evaluating the effects of customs impacts and infrastructural impacts. The coefficients for both impacts are positive when GDP is taken into account by the model. FDI inflow into Vietnam's economic sector will increase by 3.77% of improved transportation infrastructure and 3.06% more FDI flow, respectively, according to the conclusions of the study. When the model accounts for INFL, improvements in transportation infrastructure and customs effects both demonstrate positive FDI trends at 7.58% and 5.55%, respectively. The results likewise have the same positive sign when the model handles DCF, Trade, and POP independently, with the exception of the column coefficient (5), which has a negative sign. FDI growth was 6.21% and 1.97%, respectively, when customs effects and improvements in transportation infrastructure were taken into account by the model, which simultaneously controlled all variables. Except for column (5), the results are in line with what was first anticipated in terms of the coefficients' signs. Infrastructure improvements and improvements to the customs environment have made it easier to import and export goods and move them around. Investors can cut back on a lot of pointless transaction fees thanks to this. Therefore, improving customs conditions and having an advanced infrastructure may be key elements in boosting FDI flows.

We find that the coefficients are positive and statistically significant at the 1% level for the institutional and overall effects of TF. The results in Table 6 are shown in 12 columns, same like in Table 5. Columns (1) through (6) display the institutional effect, while columns (7) through (12) display the effects as a whole. It is apparent at first that the institutional effect and the overall effect can boost FDI inflows by 5.06% and 2.06%, respectively, under the control of GDP variables. Each 1% rise in these two impacts increases FDI flows by 5.35% and 2.95%, respectively, when the model accounts for the INFL variable. Institutional changes enhance FDI inflows by 3.83%, and improving the overall effect increases FDI inflows by 1.46%, according to the results when the DCF variable is controlled for. Similar results are obtained when the model simultaneously controls Trade, POP, and all five variables. The outcomes in Table 6 are in line with original estimates that TF will have a considerable economic impact with regard to the sign of the coefficients. Vietnam is now a desirable location for investors thanks to the improving investment climate. As a result, FDI inflows into Vietnam have gradually increased since Vietnam started to pursue TF reforms. This further exemplifies the advantages of TF. These justifications are entirely compatible with earlier research indicating a favorable correlation between TF and economic well-being (Go, 2018; Hillberry & Zhang, 2015; Ibrahim & Ajide, 2022; Jordaan, 2014; Nizeyimana & De-Wuft, 2015; Paulo et al., 2015; Sakyi et al., 2017).

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**Table 5. The Impact of Customs and Infrastructure Effects**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FDI (-1)	0.984* **	0.983* **	0.985* **	0.984* **	0.985* **	0.988* **	0.987* **	0.983* **	0.985* **	0.982* **	0.987* **	0.988** *
	(0.0109)	(0.0107)	(0.0105)	(0.0101)	(0.0103)	(0.0101)	(0.00972)	(0.0116)	(0.0110)	(0.0111)	(0.00963)	(0.0101)
Customs effect	0.0306 ***	0.0758 ***	0.0186 ***	0.0665 ***	- 0.0282 ***	0.0621 ***						
	(0.00852)	(0.0123)	(0.00658)	(0.0103)	(0.00814)	(0.0173)						
Infrastructure effect							0.0377 ***	0.0555 ***	0.0369 ***	0.0431 ***	0.0088 7***	0.0197* **
							(0.00538)	(0.00841)	(0.00530)	(0.00614)	(0.00228)	(0.00525)
GDP	0.623* **					-0.128 (0.361)	0.829* **					-0.218 (0.349)
	(0.104)						(0.111)					
INFL		0.251* **				- 0.0473 (0.0384)		0.316* **				-0.0397 (0.0367)
		(0.0354)						(0.0449)				
DCF			0.822* **			- 0.791* *			1.129* **			- 0.777** (0.324)
			(0.128)			(0.328)			(0.161)			
TO				0.159* **		0.516* **				0.177* **		0.503** *
				(0.0202)		(0.0695)				(0.0243)		(0.0670)
POP					0.208* **	- 0.557* **					0.238* **	- 0.505** *
					(0.0287)	(0.112)					(0.0319)	(0.0970)
Constant	- 15.94* **	- 0.311* **	- 3.666* **	- 0.217* *	- 0.865* **	- 8.996 (8.001)	- 21.35* **	- 0.486* **	- 5.174* **	- 0.288* *	- 1.086* **	- 11.02 (7.759)
	(2.719)	(0.119)	(0.633)	(0.0952)	(0.182)		(2.909)	(0.145)	(0.797)	(0.113)	(0.203)	
AR(2)	-2.01	-0.60	-2.11	0.50	-0.14	1.82	-2.32	-0.93	-2.32	0.83	-0.15	2.07
AR(2) p-value	0.045	0.551	0.034	0.619	0.885	0.068	0.020	0.354	0.021	0.408	0.877	0.039
Hansen Stat	17.14	17.64	17.58	17.99	17.79	17.92	17.95	17.75	17.70	17.83	17.97	17.91
Hansen p-value	0.104	0.224	0.174	0.207	0.216	0.118	0.209	0.167	0.169	0.164	0.208	0.118
No. of obs	234	234	234	234	234	234	234	234	234	234	234	234

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



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**Table 6. The Impact of Institutional and Overall Effects**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FDI (-1)	0.983* **	0.986* **	0.988* **	0.981* **	0.985* **	0.986* **	0.986* **	0.984* **	0.984* **	0.984* **	0.982* **	0.988* **
	(0.010 6)	(0.009 51)	(0.009 91)	(0.010 5)	(0.011 3)	(0.010 5)	(0.009 68)	(0.011 1)	(0.011 1)	(0.010 1)	(0.011 4)	(0.010 2)
Institutional effects	0.0506 ***	0.0535 ***	0.0383 ***	0.0375 ***	0.0344 ***	0.0834 ***						
	(0.010 8)	(0.011 2)	(0.008 40)	(0.007 80)	(0.006 80)	(0.013 7)						
Overall effect							0.0206 ***	0.0295 ***	0.0146 ***	0.0232 ***	0.0058 2***	0.0163 ***
							(0.003 59)	(0.004 18)	(0.002 48)	(0.003 20)	(0.001 33)	(0.003 56)
GDP	0.537* **					2.258* **	0.744* **					0.347 (0.409)
	(0.118)					(0.544)	(0.125)					
INFL		0.214* **				- 0.279* **		0.285* **				- 0.0797 *
		(0.035 9)				(0.062 3)		(0.039 6)				(0.044 4)
DCF			0.794* **			- 3.278* **			0.918* **			- 1.230* **
			(0.105)			(0.654)			(0.162)			(0.363)
TO				0.138* **		0.511* **				0.167* **		0.507* **
				(0.022 6)		(0.077 1)				(0.021 6)		(0.068 0)
POP					0.223* **	0.552* **					0.231* **	- 0.555* **
					(0.030 4)	(0.095 9)					(0.041 8)	(0.106)
Constant	- 13.82* **	- 0.330* **	- 3.635* **	- 0.187* (0.105)	- 1.064* **	- 40.86* **	- 19.18* **	- 0.477* **	- 4.180* **	- 0.313* **	- 1.034* **	- -1.203 (8.918)
	(3.097)	(0.101)	(0.530)		(0.210)	(10.93)	(3.262)	(0.138)	(0.804)	(0.102)	(0.260)	
AR(2)	-2.83	-2.32	-2.76	-1.09	-1.62	-1.43	-2.55	-1.81	-2.51	-0.04	-0.43	1.19
AR(2) p-value	0.005	0.020	0.006	0.278	0.106	0.153	0.011	0.071	0.012	0.965	0.667	0.235
Hansen Stat	15.93	17.36	17.97	17.38	17.81	17.70	17.20	17.70	16.97	17.99	16.65	17.92
Hansen p-value	0.144	0.098	0.208	0.183	0.215	0.221	0.102	0.221	0.109	0.207	0.119	0.118
No. of obs	234	234	234	234	234	234	234	234	234	234	234	234

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

This analysis does a robustness check using the cost and labor hours needed for import and export operations to confirm the beneficial effect of Vietnam's TF on luring FDI. The estimating model predicts that decreasing import and export costs and hours may result in greater FDI inflows. Table 7 displays the test's outcomes. Table 7's findings are presented in five columns:

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column (1) presents the influence of import costs; column (2) the impact of imported hours; column (3) the impact of export costs; column (4) the effect of export hours; and column (5) the overall impact of import and export costs and hours. The results demonstrate that the reduction in import and export costs and time has a beneficial impact on luring FDI as anticipated based on the sign of the coefficient. The outcomes in Table 7 likewise demonstrate that each coefficient is statistically significant at the 1% level, which is similar to the outcomes in Tables 6 and 7. Table 5 to 7's findings show that improvements to Vietnam's legal, social, and business environments, along with government investments in infrastructure throughout time, have provided a driving force to encourage investment from foreign firms. As it pertains to the accomplishment of the sustainable development goals as well as Vietnam's future development, the topic of drawing more foreign direct investment into Vietnam seems relevant.

**Table 7. Effect of Cost and Hours to Import and Export on FDI Flows**

	(1)	(2)	(3)	(4)	(5)
L.FDI	0.987*** (0.00978)	0.987*** (0.00958)	0.987*** (0.00972)	0.987*** (0.00967)	0.987*** (0.00975)
<i>Im_cost</i>	-2.671*** (0.695)				
<i>Im_hours</i>		-0.381** (0.158)			
<i>Ex_cost</i>			-0.885** (0.422)		
<i>Ex_hours</i>				-0.237** (0.113)	
TF					-1.675*** (0.542)
GDP	0.144 (0.344)	0.0107 (0.362)	-0.137 (0.339)	-0.121 (0.346)	0.0115 (0.341)
INFL	-0.109** (0.0464)	-0.107** (0.0497)	-0.0928** (0.0460)	-0.0884* (0.0457)	-0.103** (0.0464)
DCF	-1.481*** (0.424)	-1.355*** (0.425)	-1.188*** (0.398)	-1.260*** (0.413)	-1.339*** (0.411)
TO	0.488*** (0.0803)	0.499*** (0.0817)	0.496*** (0.0816)	0.499*** (0.0816)	0.493*** (0.0810)
POP	-0.478*** (0.105)	-0.438*** (0.101)	-0.437*** (0.0993)	-0.427*** (0.0980)	-0.458*** (0.102)
Constant	20.70*** (6.814)	9.539 (7.209)	15.64** (6.674)	11.63* (7.043)	19.63*** (6.800)
AR(2)	0.21	1.41	1.64	1.52	1.00
AR(2) p-value	0.835	0.158	0.102	0.129	0.319
Hansen Stat	17.47	17.53	17.47	17.51	17.47
Hansen p-value	0.133	0.131	0.133	0.131	0.133
No. of obs	234	234	234	234	234

Note: Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The overall goal of this study is to determine whether TF contributes to the growth of foreign direct investment in Vietnam. Empirical findings show that increases in TF can increase the likelihood of receiving FDI inflows. The findings of this study are in line with those of other research, which has demonstrated that TF can boost FDI inflows (Chimilila et al., 2014a; Dollar et al., 2006; Duval & Utoktham, 2014a, 2014b; Engman, 2005; Seck, 2014). But at the same time, our conclusions contradict those of Ibrahim and Ajide (2022). This also demonstrates that not all nations' TF implementations will be successful. The explanation from Sakyi et al. (2018) is that African nations lag behind other continents in terms of transportation

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infrastructure. An important component of a country's ability to meet its TF responsibilities is its transport infrastructure (Yu & Luu, 2022). Consequently, this might also be a factor affecting these countries' capacity to draw FDI inflows.

### IV. CONCLUSION AND RECOMMENDATIONS

The goal of this study is to determine whether TF contributes to Vietnam's ability to draw in foreign direct investment. The study's focus is restricted to 18 economic sectors in Vietnam from 2007 to 2019 based on the data that is currently available. The definition of TF's scope takes into account institutional, societal, and infrastructure implications. The findings demonstrate that raising TF greatly lowers the obstacles to luring FDI. For robustness testing, the cost and labor hours associated with border compliance and documentation during import and export are employed to simulate the TF effect. The outcomes are consistent with earlier outcomes. These findings are in line with those of earlier research (Chimilila et al., 2014a; Dollar et al., 2006; Duval & Utoktham, 2014a, 2014b; Engman, 2005; Seck, 2014). However, this conclusion also runs opposite to Ibrahim and Ajide (2022). Generally speaking, Vietnam's improved economic climate between 2007 and 2019 has generated a driving force to promote international investment.

All socioeconomic sectors in Vietnam have been impacted by the COVID-19 epidemic, which has hampered trade and investment activity and disrupted supply networks. In light of this, Vietnam needs to adjust its strategic focus in order to draw FDI in the future:

1) Maintain a stable macroeconomic environment and increase the economy's resilience to external shocks. In order to give foreign investor, the confidence they need to develop long-term investment plans in Vietnam, policy consistency and stability are also consistently upheld.

2) Vietnam must create a long-term FDI strategy that prioritizes projects with high added value and contemporary management techniques, moving the emphasis of foreign investment and cooperation policies from quantity to quality. choose FDI projects, and there should be different laws for companies that concentrate on important national goals.

3) Joint ventures with domestic businesses that involve FDI in investment and production are required to be encouraged and given the best possible circumstances. This intends to give Vietnamese businesses access to FDI companies' cutting-edge technology and management capabilities.

4) Modify, streamline, and make known the processes and procedures for investment approval. Create a long-term plan to make administrative processes visible and easy to understand while also significantly improving the business environment. Promote investment while also improving the nation's public infrastructure.

### AUTHOR STATEMENT

The authors have no relevant financial or non-financial interests to disclose. The authors have no conflicts of interest to declare that are relevant to the content of this article.

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## Gabriella Morreale, The Italian-Spanish Chemist who Introduced the Heel Prick Test in Newborns



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**ABSTRACT:** This article shows the biography of a woman, Gabriella Morreale, born in Italy but nationalized Spanish for having lived since she was eleven years old and having developed her brilliant work in that country, to whom many merits are owed because of the important discoveries that she did in her professional activity as a graduate and doctorate in Chemistry. Among its milestones are the introduction of the heel prick test, a clinical test for the early detection of congenital metabolic diseases, and her studies on iodine deficiency, especially serious among the youngest, because it can cause brain damage. The main objective is to remember her figure and put her as a reference to society. The methodology followed has been the usual one in this type of works, the search in mainly primary sources of data about her life and the importance of her scientific research.

**KEYWORDS:** Italian Spanish chemist women, Gabriella Morreale, the heel prick test in newborns, iodine deficiency, history of sciences.

### 1. INTRODUCTION

Although there are some very good biographies in the literature, albeit scarce, about Gabriella Morreale, an Italian-Spanish woman, born in Milan at the beginning of the 30s of the last century and who later obtained Spanish nationality in 1953, her figure goes almost unnoticed for society in general, which ignores her transcendental scientific milestones. And all this despite her scientific work makes her worthy of being recognized as one of the best chemists of the second half of the 20th century, thanks to the important discoveries she obtained throughout her career, both nationally and internationally,

This article is written with the intention of highlighting that woman in society, showing a biography of hers that completes those already existing in the literature with novel data. Its main objective is to put this woman as a referent to society and show her as a model and example for the rest of the women who have the same aspirations.

The methodology followed in the article has consisted of searching for information on her in all types of sources, basically primary, in archives and records, both bibliographic and digital, with the aim of highlighting all the relevant aspects of her life that are not contemplated in the scarce previous biographies existing about her.

The acronyms used in this article are as follows: CSIC represents the Spanish "Consejo Superior de Investigaciones Científicas" (see Note 1); CIB-CSIC the Spanish "Centro de Investigaciones Biológicas del CSIC" and UAM the Spanish "Universidad Autónoma de Madrid".

### 2. RESULTS: GABRIELLA MORREALE: HER BIOGRAPHY

In this section we present the biography of Gabriella Morreale, emphasizing the most important aspects of her professional activity and completing some of the existing biographies of her in the literature with new data.

The woman who has become the forerunner of modern endocrinology in Spain, for having been a pioneer researcher of thyroid hormones and responsible for the implementation of early detection of congenital hypothyroidism in Spanish healthcare, reducing the cases of cretinism by thousands, Italian-born and later naturalized Spanish Gabriella Morreale de Castro, was born on April 7, 1930 in Milan.

She grew up in a family with a high academic background. Her parents, Eugenio Morreale and Emilia de Castro, a native of Milan, were both biologists. Both her maternal grandfather and great-grandfather (Italian) were university professors and her mother was responsible for the classification and conservation of boa snakes saved from the bombing of World War II in Milan [1].



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As her father was a Sicilian diplomat, the family lived in different places in the years following Gabriella's birth, so she lived in Milan, Vienna and Baltimore, where her father was appointed as Italian consul, before the family was repatriated to Europe due to imminent danger of war, when she was 11 years old. The new father's destination as Italian consul was Malaga where she was enrolled in the German School, then in the Institute Vicente Espinel (where Severo Ochoa (1905-1993), Nobel Prize in Physiology or Medicine in 1959 together with the American Arthur Kornberg, also studied) and finished high school at the Colegio de El Monte in Malaga. Figure 1 shows her when she was 14 years old.



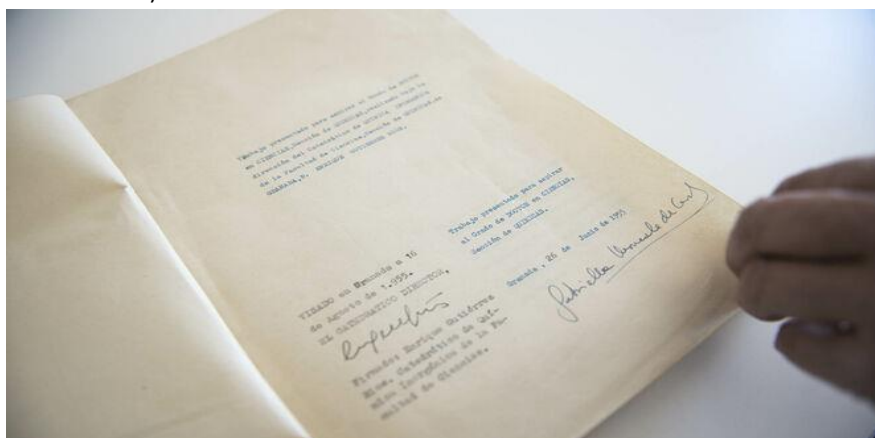
**Figure 1. Gabriella Morreale, when young.**  
Source: Diario Sur, Málaga, 3 Aug, 2021

Her vocation for science awoke as a child, playing with her mother's microscope. Therefore, after finishing secondary studies, she moved to Granada, to start an scientific university career. In this way, Gabriella Morreale studied Chemical Sciences, a degree that she finished in 1951 in just four years, instead of the usual five, thanks to a permission she requested and obtained from the Rector, obtaining honors in thirteen of the seventeen subjects and also the extraordinary career prize, at the University of Granada [1].

After graduating in Chemistry, she was awarded a CSIC scholarship to work on Physiopathology of Nutrition that same year with Professor Enrique Ortiz de Landázuri (see Note 2). She continued her activity receiving a scholarship from the Rectorate of the University of Granada (1953) to carry out her doctorate.

In 1954, she served as head of the Physiopathology of Nutrition Section of the CSIC, also in Granada (1954-1957) and finally, and with the highest qualification, she received the title of Doctor of Science from the same University in 1955 (almost 50 years later, in 2001, she would receive another doctorate, the Doctor of Medicine, honoris causa, from the University of Alcalá de Henares (Spain)) [1]. As a curiosity, indicate that 1951 was the first year in which doctoral theses could be defended at another University different from the Central University of Madrid.

Her doctoral thesis in Chemist (Figure 2) was directed by Professor Enrique Gutiérrez Ríos (see Note 3). In it, she showed that the high incidence of goiter (a swelling of the thyroid gland that causes a swelling in the neck) in the Alpujarras (a poor region of the province of Granada) was due to the lack of iodine in the área (later, she would carry out this same study in the region of Las Hurdes, in Extremadura).



**Figure 2. Gabriella Morreale's Ph.D. Thesis. Source: CSIC**

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Between her bachelor's degree and her doctorate, Gabriella Morreale married the Spanish doctor and surgeon Francisco Escobar del Rey in 1953 (see Note 4), whom she had met in the Alpujarras [1]. That same year, she became a Spanish citizen.

Once both had completed their doctoral thesis (her husband's doctoral thesis had been advised by Eduardo Ortiz de Landázuri and was focused on the administration of iodized salt in the Alpujarras) and both being convinced that in order to carry out research of a certain quality they needed to broaden their training, they moved to Madrid and, there, guided by Professor José María Albareda, general secretary of the CSIC (see Note 5), requested and obtained scholarships to work together at the Department of Endocrinology at the University of Leiden (Holland), invited by Professor Andreas Querido (see Note 6), where they specialized in the study of the thyroid from a bidisciplinary approach, each with their knowledge [1 and 2].

After that stay, the couple returned to Spain in 1957-1958, since, apart from being the country of the husband and the country of adoption of the wife, it was in Spain where the iodine levels were especially low and, therefore, where they could take better advantage of their knowledge and at the same time help improve people's lives. In Madrid, thanks again to profesor Albareda, they stayed at the CSIC Residence, where they wrote their first publications.

In that time and again with the generous intervention of profesor Albareda, they obtained the help of Jesús García Orcoyen (see Note 7), who provided them with the means to develop a method to assess iodine in urine and water, and to carry out a study in the Community of Madrid, which revealed a high incidence of goiter and iodine deficiency in each of the six zones into which it had been subdivided [1].

She joined the CSIC as a scientific collaborator, joining CIB-CSIC, and as a scientific researcher, she founded and was Head of the Thyroid Studies Section of the Institute Gregorio Marañón between 1963 and 1975

Immediately afterwards, she was director of the Gregorio Marañón Institute of Endocrinology and Metabolism between 1975 and 1980. During that interval, in 1975, while she was a research professor, she moved with her group to the Faculty of Medicine of the UAM, turning her laboratory into one of the pillars of the current "Alberto Sols" Biomedical Research Institute (IIB-CSIC-UAM), of which she was deputy director from 1984 to 1990. She was also part of and chaired the Spanish Society of Endocrinology, from 1975 to 1979 and was a founding member of the European Thyroid Association, which he chaired in 1977 (a very brief biography on Alberto Sols can be checked in Note 8).

During all those years, her scientific and research career was bright and extensive. She and her collaborators provided what is now known about the functioning and diseases that affect the thyroid and its functions. Among others, in 1976 she began the pilot study to detect congenital hypothyroidism in newborn children, which gradually spread throughout the country, which today allows early diagnosis and treatment with thyroid hormone, which prevents mental retardation of approximately 150 children a year.

In addition, Gabriella Morreale analyzed and demonstrated that the mother's thyroid hormone crosses the placenta during pregnancy and influences the brain development of the fetus, which led to the administration of iodine supplements to pregnant women becoming a common practice to avoid problems in that development.

She always wanted, and tried, that her work would not stay in the laboratory, but would move into people's lives and change their lives for the better. Apart from the two issues mentioned above, the heel prick test to detect metabolic problems in newborns and iodine supplementation for pregnant women to prevent problems in the fetal brain development, we must add another measure that managed to transfer it to the health authorities: the need to iodize common salt to ensure that the population consumed enough iodine to avoid the problems that a deficit of this element could cause. Let us recall that the heel prick test is a clinical test for the early detection of congenital metabolic diseases. It consists of punctures in the heel that are performed on neonates to obtain a blood sample. It is used to detect pathologies such as congenital hypothyroidism, congenital adrenal hyperplasia, hyperphenylalaninemia or phenylketonuria, congenital hemoglobinopathies, biotinidase deficiency or galactosemia. Through this test, serious brain and neurological disorders, growth disorders, respiratory problems and other serious developmental complications can be detected. This detection through clinical analysis is important because children may not present an apparent sign after birth, but its existence causes serious health problems in the first months of life.

Likewise, together with her husband (Figure 3), she directed numerous epidemiological studies in all the regions of Spain that have allowed to gain an in-depth understanding of the problem of iodine deficiency and its psychosocial consequences, and its correction through the introduction of iodized salt in the 1990s. of the last century. According to Juan Bernal and M.<sup>a</sup> Jesús Obregón, from IIB-CSIC-UAM "Alberto Sols" in Madrid, *"Her work has had a great impact on public health actions that have prevented thousands of cases of mental retardation"* [3].





**Figure 3. Gabriella Morreone and her husband working in the lab. Source: Diario “El Mundo”, 28 Jun, 2018**

In addition to publishing more than 200 highly relevant scientific papers, her research on thyroid hormones allowed the practical eradication of goiter due to iodine deficiency in Spain, when iodized salt was commercially incorporated, and she contributed decisively to the decision to provide iodine supplements pregnant mothers to ensure proper brain development of the fetus. Among her numerous publications, the following may be cited [1]

1. With J. R. Mora Lara y F. Escobar del Rey, “Sobre la dosificación de sodio en suero”, en *Laboratorio*, 9 (1951), págs. 1-10.
2. With F. Escobar del Rey et al., “Bases científicas que aconsejan el uso de la sal yodada en la profilaxis del bocio endémico”, en *Revista Clínica Española*, 54 (1953), págs. 285-289.
3. With F. Escobar del Rey, “Studies on the peripheral disappearance of thyroid hormones-ii-the effect of swimming for two hours on the <sup>131</sup>i distribution in thyroidectomized I-thyroxine maintained rats after the injection of <sup>131</sup>i labeled I-thyroxine”, en *Acta Endocrinológica*, 23 (1956), págs. 393-399.
4. With F. Escobar del Rey, “The effect of thiouracil, methylthiouracil and propylthiouracil on the metabolism of thyroid hormones in thyroidectomized Ithyroxine maintained rats”, en *VV. AA., Advances in thyroid research*, London, Pergamon Press, 1960, págs. 80-87.
5. With F. Escobar del Rey et al., “Increase of the rate of release of thyroidal <sup>131</sup>i and of circulating thyrotropic activity at early stages of propylthiouracil treatment in the rat”, en *Nature*, 191 (1961), págs. 1171-1174.
6. With S. Ares, “Alteraciones tiroideas en el recién nacido”, en *VV. AA., Tiroides*, Madrid, Mc Graw Hill, 2007, cap. 7.
7. With M. J. Obregón y F. Escobar del Rey, “Iodine deficiency and brain development in the first half of pregnancy”, en *Public Health Nutrition*, 10 (2007), págs. 1554- 1570.
8. With J. Sánchez-Vera et al., “Inadequate iodine nutrition of pregnant women from Extremadura (spain)”, en *European Journal of Endocrinology*, 159 (2008), págs. 439-445.
9. With M. J. Obregón, “Consecuencias de la deprivación de iodo y hormonas tiroideas en el desarrollo cerebral”, en A. M. Pascual- Leone y J. M. Medina (eds.), *Desarrollo perinatal: origen de las patologías adultas*, Madrid, Instituto de España, Real Academia Nacional de Farmacia, 2008, págs. 107-130.
10. With M. Rivas et al., “The dream protein is associated with thyroid enlargement and nodular development”, en *Molecular Endocrinology*, 23 (2009), págs. 862-870.
11. With M. J. Costeira et al., “Parameters of thyroid function throughout and after pregnancy in an iodine-deficient population”, en *Thyroid*, 20 (2010), págs. 995-1001.
12. With C. Grijota-Martínez et al., “Lack of action of exogenously administered t3 on the fetal rat brain despite expression of the monocarboxylate transporter 8”, en *Endocrinology*, 152 (2011), págs. 1713-1721.

Gabriella Morreale received numerous distinctions and awards for her bright and extend work, both in life and after her death. Among the awards received in life can be cited the following: Francisco Franco Award from the Science Division of the CSIC, 1968 (shared with her husband); National Prize for Research in Medicine, from the Presidency of the Government, 1977 (shared with her husband); Reina Sofía Research Award for the Prevention of Subnormality, 1983 (shared with her husband and A. Ruiz-Marcos); European Thyroid Association Research Award (1985); Order of Merit of the Italian Republic (1987); Severo Ochoa Award for Biomedical Research, Ferrer Foundation, 1989 (shared with her husband); First Prize for Research in Endocrinology and Nutrition, Spanish Society of Endocrinology, 1991 (shared with Her husband); Pitt-Rivers Lecture Award, granted by the British Societies of Endocrinology (1994); honorary academician of the Royal Academy of Medicine (1994-); the Ramón Areces Foundation

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organized an international symposium on thyroid hormones, in her honor and that of her husband (1995); José Gómez-Acebo National Biology Award, VII National Living Culture Awards (shared with Her husband), 1996; National Award for Medical Research Gregorio Marañón (1997); Rey Jaime I Prize for Clinical Medicine (1998); Doctorate in Medicine, honoris causa, from the University of Alcalá (2001); Serge Lissitzky Award from the European Thyroid Association (2009) [1].

And as regards the awards obtained posthumously, the CSIC paid tribute to her in 2018 [4], and the University of Granada paid also tribute to her on 3 Jun [5], 2022. Moreover, in 2020, the book entitled "*Gabriella Morreale, her life and her time*", was awarded in October 2020 with the XXIII National Award for University Publishing in the category of Best Outreach Work scientific. The authors are the researchers women of the CSIC María Jesús Obregón, disciple of Gabriella Morreale and researcher at the IIB-CSIC-UAM until her retirement; Flora de Pablo, belonging until her retirement to the CIB-CSIC, and Francisca Puertas, from the Eduardo Torroja Institute of Construction Sciences (IETcc-CSIC), and the mathematician José Pedro Moreno, from the UAM. This award, granted by the Union of Spanish University Publishers (UNE), recognized the best works published by Spanish universities and research centers during 2019. On behalf on all the authors, Moreno affirmed that [6]:

*Writing about Gabriella was something totally necessary to value and make her figure visible as a woman, wife, mother and magnificent scientist at a time when it was very difficult for women to have an important scientific career. She got it, and with a vengeance. In addition, she created a school in Spain and abroad.*



**Figure 4. Gabriella Morreale. Source: [2]**

Also, Gabriella Morreale (Figure 4) was a great teacher of scientists. She trained several generations of students (women and men) at the Faculty of Medicine of the Autonomous University of Madrid, at the Gregorio Marañón Institute of Endocrinology and Metabolism and at the "Alberto Sols" Biomedical Research Institute, training them in the field of endocrinology of thyroid hormones, both from the basic and applied point of view, all of them contributing to the birth of experimental and molecular endocrinology in Spain. She conveyed to all of them her passion for knowledge, scientific rigor and the need to help populations at risk. According to Juan Bernal and M<sup>a</sup> Jesús Obregón, researchers from "Alberto Sols" [7]: "*Those of us who have been their disciples recognize her passion for science and scientific rigor, as well as her kindness and the sweetness of her carácter*".

Also, according Susana Ares, Coordinator of the Thyroid Group of the Spanish Society of Pediatric Endocrinology [8]:

*As a person, her cheerful and familiar treatment, ability to work and her wonderful intelligence adorned with great simplicity were to be highlighted. I have sincerely admired her, for her integrity, her rigor, perseverance and professionalism. Every day I learned something, but above all what he taught me was the enthusiasm, the passion for knowledge, the generosity and intellectual modesty. I support myself directly, unconditionally and with her continuous example, for her deep kindness and sweetness and until her death, because Gabriela always considered me like a daughter.*

Gabriella Morreale (Figure 5) was retired (compulsory) in 1995, upon reaching the age of sixty-five, but she continued researching as a doctor linked ad honorem to the CSIC. From May 1997 until she was seventy years old, she was hired by the CSIC. She passed away in Madrid, on 4 Dec. 2017. The fruit of her marriage were her son, Héctor, and a granddaughter, all of whom survived her husband Francisco Escobar.



Figure 5. Gabriella Morreale and her husband together with the then Kings of Spain, Don Juan Carlos I and Doña Sofía. Source: [9]

### 3. CONCLUSIONS

During the first hours of a baby's life, doctors perform various clinical tests to check their health. One of the most frequent diagnostic tests in several countries around the world, including Spain, is the heel test, a blood draw in this area of the foot that is performed 48 hours after birth. The objective of this analysis is to rule out that the child suffers from congenital metabolic diseases, brain or neurological disorders, respiratory problems or growth disorders. If the results are positive, doctors can take action early and treat children before the first symptoms appear. Also, do not forget that years after Spain adopted the heel prick test, UNICEF decided to imitate the measure and apply the blood test to newborns around the world. On the other hand, since 1990 the World Health Organization has recognized the right to consume iodine during pregnancy and early childhood. Therefore, diagnosing this condition at time is fundamental, and this was an achievement achieved by the Italian-Spanish chemist Gabriela Morreale, unknown by society despite her extremely important research.

A vision of the life of Gabriela Morreale justifies without any doubt that she should be considered one of the most important Spanish chemical women of the second half of the 20th century. She was one of the founders of modern Endocrinology in that country, dedicating her efforts and her work to the study of the role of iodine and thyroid hormones in brain development. As the most important milestones, in the 1970s she introduced the study for the detection of congenital hypothyroidism in newborn children, which gradually spread throughout the country, allowing early diagnosis and treatment with thyroid hormone, which prevents mental retardation of approximately 150 children a year. To do this, she initiated the routine measurement of TSH and thyroid hormones in the heel blood of newborns to prevent hypothyroidism and congenital cretinism and later demonstrated the importance of maternal thyroid hormones in the development of the fetal brain, contributing to define the nutritional requirements of iodine of pregnant women. Her work has had a great impact on public health actions that have prevented thousands of cases of mental retardation.

However, as it has been already indicated, except in the scientific world and not excessively, she is a figure quite unknown by society, which has not recognized her what her work has undoubtedly deserved.

For all these reasons, the author considers that this woman should be taken as a reference by society, which should recognize her and grant her the merits all of her meritorious work.

### NOTES

These notes explain some aspects and show some very brief biographies of people appearing in this work.

1. El Consejo Superior de Investigaciones científicas (CSIC) is a Spanish state agency attached to the Ministry of Science and Innovation with the consideration of a public research organism. Its fundamental objective is to develop and promote research for the benefit of scientific and technological progress, for which it is open to collaboration with Spanish and foreign entities. According to the SIR World Report 2012 classification, it is the largest public institution dedicated to research in Spain, having

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become ninth in the world in 2012. It is multidisciplinary in nature and carries out advanced research in all scientific areas thanks to its 121 institutes and three national centers distributed in all the autonomous communities of Spain, similar to the French CNRS. It was created after the Civil War by the founding law of November 24, 1939. In <https://www.csic.es/es/el-csic>

**2.** Eduardo Ortiz de Landázuri Fernández de Heredia (1910 - 1985) finished his degree in Medicine at the Central University of Madrid in 1933. In 1935 he was awarded a scholarship by the Junta de Ampliación de Estudios to carry out a stay at the German University of Frankfurt am Main. After the Spanish Civil War, in which he served as medical lieutenant in the republican army, he was subjected to a purification process from which he was acquitted. In 1946 he obtained the chair of General Pathology at the Faculty of Medicine of Cadiz, dependent on the University of Seville, and that same year he acceded to the same chair at the University of Granada. In 1951 he was dean of the Faculty of Medicine of Granada and the following year he obtained the chair of Clinical and Medical Pathology of that Faculty. In 1958 he was vice-rector of the University of Granada and in October of that year he moved to Pamplona to work at the Medicine School of the General Study of Navarra. He was dean of the Faculty of Medicine of that University on two occasions and between 1966 and 1969 he was vice-rector of the University. His canonization is currently under study. In <https://dbe.rah.es/biografias/21542/eduardo-ortiz-de-landazuri-y-fernandez-de-heredia>

**3.** Enrique Gutiérrez Ríos (Madrid, 1915-1990), graduated in Pharmacy and doctor in Chemical Sciences, held the chairs of Inorganic Chemistry at the universities of Granada and Madrid, becoming rector of the latter between 1964 and 1967. Among other positions he was Member of the Council of State of Spain, of the Council of the Kingdom, president of: CSIC between (1973-1974), of the National Council of Education, of the Advisory Commission for Scientific and Technical Research, of the Royal Spanish Society of Physics and Chemistry and director of the Department of Inorganic Chemistry at the Complutense University of Madrid. He received, among others, the Francisco Franco Science Prize (1966) and José María Albareda (1970), as well as the Grand Cross of the Civil Order of Alfonso X el Sabio (1964). In <https://dbe.rah.es/biografias/11421/enrique-gutierrez-rios>

**4.** Francisco Escobar del Rey (Villaviciosa de Córdoba, 1923-Madrid, December 16, 2015) graduated from the Faculty of Medicine of the University of Granada in the 1950s and presented his doctoral thesis on the administration of iodized salt in the region of Las Alpujarras, directed by Professor Ortiz de Landazuri. Since then, his scientific career cannot be separated from that of his wife, Professor Gabriela Morreale. Both worked for years at the University of Leiden together with Professor Andreas Querido. In 1958, they returned to Spain and founded the Thyroid Study Unit at the Higher Council for Scientific Research. In 1974, they became part of the Autonomous University of Madrid and co-founded the Biomedical Research Institute. He participated in numerous studies on the physiology of the thyroid gland and on the metabolism of thyroid hormone. Both he and Morreale made important contributions in this field, including the conversion of peripheral tissues T4 to T3. They also stood out for their work with maternal hormones in the development of the fetus. In addition, they conducted studies on iodine in Spanish areas where salt was lacking and they made iodized salt known. They also developed the screening program for congenital hypothyroidism in newborns. His research related iodine deficiency in pregnant women with important neuronal disorders in children, such as cretinism, and in direct relation to school failure, lower than average mental quotients or hyperactivity. Remained active until 2007, when he retired at the age of 84. At the end of his career he was named favorite son of his hometown. In [https://www.eurothyroid.com/files/download/obituaries/obituary\\_escobar-del-rey.pdf](https://www.eurothyroid.com/files/download/obituaries/obituary_escobar-del-rey.pdf)

**5.** José María Albareda Herrera (1902 - 1966), born in Caspe (Zaragoza), prominent member of Opus Dei, studied Pharmacy at the University of Madrid and Chemical Sciences at the University of Zaragoza, where he began scientific research. He obtained a doctorate in Pharmacy. He was Professor of Agriculture at the Institute of Secondary Education of Huesca and, in 1940, he obtained the chair of Applied Geology at the Faculty of Pharmacy of the University of Madrid. When the CSIC was created by the Franco government in 1939, he was appointed general secretary, a position he held until his death. He was rector of the University of Navarra (1960-1966) and founded and directed the Institute of Edaphology in Spain. In <https://dbe.rah.es/biografias/5972/jose-maria-albareda-herrera>

**6.** Andries Querido (Amsterdam, September 15, 1912 - Oegstgeest, January 30, 2001) graduated in Medicine from the University of Amsterdam, where he received its gold medal for research he carried out as a student assistant, on the need for vitamin D in relation to the calcium and phosphorus composition of the diet. That work was the germ of his doctoral thesis, which he obtained at the age of 23 and that gold medal also earned him a travel scholarship to carry out pathophysiological research in American scientific institutes. He was Professor of Internal Medicine at the University of Leiden and founder of the Faculty of Medicine of Rotterdam. In <http://www.biografischportaal.nl/persoon/90086187>

**7.** Jesús García Orcoyen (1903 – 1988), born in Estenoz (Navarra), studied Medicine at the University of Madrid, where in 1924 he was appointed assistant for practical classes of the chair run by Sebastián Recasens y Girols. He received his doctorate in 1931



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with an Extraordinary Prize and that same year he was appointed assistant professor of the chair of Obstetrics and Gynecology at the Faculty of Medicine in Madrid, which he won by opposition in 1943. He was General Director of Health in 1960 and 1965. He received innumerable distinctions and honors and in 1974 he joined the Royal National Academy of Medicine as a full academician. In <https://dbe.rah.es/biografias/10407/jesus-garcia-orcoyen>

8. Alberto Sols García (Alicante, 1917- Denia, 1989) is considered in the field of Science as the pioneer of Biochemistry in Spain. He studied Medicine at the University of Valencia and received his doctorate at the Complutense University of Madrid, subsequently moving to Barcelona to carry out his research work. In 1951, through a scholarship from the Junta de Ampliación de Estudios, he moved to the United States where he worked for three years at Washington University in St. Louis, Missouri, together with the marriage of researchers, both Nobel Prize winners in Medicine, Carl Cori and Gerty Cory. There he conducted various studies on hexokinase, the enzyme that determines the energy metabolism of the brain. He returned to Spain in 1954 and continued his research work at the CSIC, at the Center for Biological Research. In 1957 he received the Francisco Franco Prize for Science for his work on enzymatic phosphorylation and active transport of sugars. In 1976 he was appointed Professor of Biochemistry at the Autonomous University of Madrid. He has published nearly 200 papers in specialized journals, most of them in the United States. In 1963 he was President-Founder of the Spanish Society of Biochemistry and in 1981 he received the first Prince of Asturias Award for Scientific and Technical Research. In 1987 he received the Santiago Ramón y Cajal National Research Award from the Ministry of Education and Science. In <https://dbe.rah.es/biografias/17434/alberto-sols-garcia>

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## Competency and Ability of Workers in Four Day Work Week



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**ABSTRACT:** Creating a sustainable work environment has been a very big strategy for the HR retention policies. Work places where employees are given some relief in terms of work hours or now even days has proved to be very helpful in the efficiency of workers. Studies have been conducted on 4 day work week policies of workers across the world and the conclusion has been very positive and has supported the four day work week policy. Very often we come across people who are tired and their working efficiency decreases with increased level of fatigue and lack of family time. Lack of work life balance has been the most common reason of attrition irrespective of geography and profession. Considering this scenario, human resource management leaders have been promoting the four day week work policy for all the employees in their company. This paper would study the benefits and challenges observed with the four day work week policy. The study would highlight the feasibility of this practice in the long run.

**KEYWORDS:** Work Efficiency; Workers; Four day work week; Work life balance; Family time

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### INTRODUCTION

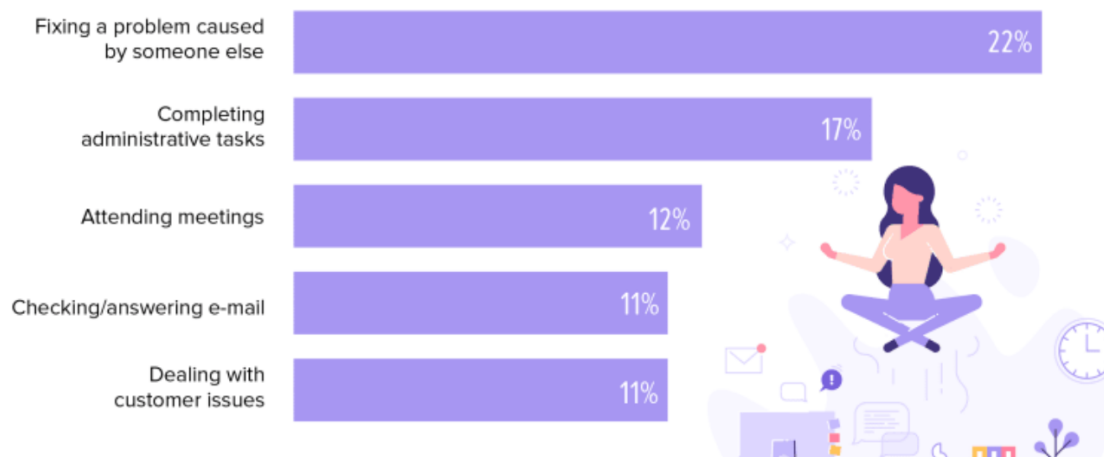
The decreased level of energy and disinterest of the staff represent a risk for any company, be it a large corporation or a small start-up. Productivity falls, the environment is dense and conflicts take over. To avoid this scenario, it is necessary to guarantee a concrete incentive that mobilizes the team and promotes growth. Companies must respect the employee and set instructions to make them more comfortable and effective. On the other hand, mutual partnerships must be established by aims, namely to contribute the employee to the work goals. In order to achieve their own goals, companies need to have the required policies. Therefore, the mechanisms for personal and career achievement will have to be strengthened.

The significance of the study is that retention of employees has gained great strength within organizations. It allows identifying individuals located in key positions within the aviation company, and taking actions that are aimed at remaining in it. The current work industry across the world is tremendously changeable and much nuanced, administrators and workers are well aware of the value of corporate reward systems. It motivates experienced, educated and trained practitioners to produce positive and even excellent results. Companies are retained in the business. Incentive programs are excellent allies for business success. Keeping employees motivated is a strategy that increases productivity and improves the quality of the work environment. Recognition and reward are two ingredients as rewarding as receiving the salary at the end of the month. (Sadik, R.M., 2018)

The research is important because it will point out the advantages from implementing employee incentive programs and improving morale of employees and the retention of personnel. It will generate an increase in productivity and improves the quality of the work environment by learning how incentive programs can influence employees' morale shown in Figure 1.

### Does a 4-Day Workweek Make Employees More Productive?

Nearly half of workers worldwide said they could do their job in less than five hours each day if left uninterrupted. Workplace time wasters, employees said, include:



**Figure 1: Productivity in a 4-day work week**

**Source:** <https://www.shrm.org/resourcesandtools/hr-topics/employee-relations/pages/four-day-workweek.aspx>

Four day work week policy is gaining momentum across the world and is being appreciated for its better productivity. The impact of employee incentive programs on employee retention and morale depends on how much correlation employees' behaviour show with these incentives and the retention rate. There are cases when the long term goals of employees are different and the incentive programs offered by the companies do not add much value to their morale. So, this depends on employee to employee and their goals and objectives. Companies aim to establish themselves as a leader in the work services across the world. The company's objective is to become a one stop incentive station for all the work services and gain employee satisfaction in the long term. It also plans to reduce the retention rate for the employees and acquire new employees in the long run. The company has define its current strategy to fulfil its aims and objectives by designing a long term plan to take care of the existing problems in their work services and have planned to launch features based on the employee pain points to gain a competitive advantage in the market. The company has set a target of making their employees happy and retentions a lot of profit with the volume of employees and their trust is expected to create a brand value for the company in future. (Sharma, G., 2017)

A comparison with the other leading incentive providers would be a good area of study. The present strategies of companies have been phenomenal in achieving the organizational goals. The company has divided its strategies into short term, medium term and long term goals. The short term strategy focuses on employee satisfaction, the medium term strategy focuses on reducing the employee retention and the long term strategy focuses on profit and expansion of the company across the world by acquiring new employees. This clear division of strategy and defined goals has established a stable image of the company along with strong involvement of stakeholders to work together for a common aim of achieving organizational goals. This strategy of the company will bring further growth and stability to the company's brand image and would make it a strong incentive provider.

Organizations have planned its objectives well every year to grow at a steady rate. The company has slowly gained the trust of the employees to create a niche market by serving best telecom services and employee support. The employee satisfaction and acquisition of new employees has been the planned objectives of the company. The company is in the middle of its growth path and similarly the planned objectives have also been achieved partially with the brighter future scope. The company plans to continue this rate of growth and expansion to acquire more employees and establish its brand image. The further growth and expansion of the company is in the planned objective which is supposed to be achieved in medium term from now. As of now, the defined and planned objectives of the company have been achieved well and have a huge scope of doing better business in future. Long term goals of the company are to establish as a leading work incentive provider in the market by providing high value incentive program. Companies have been excelling in creating the long term strategies to align with the company's aims and objectives. The existing organizational strategy focused on employee satisfaction and expansion by acquiring new employees and reducing the retention rate of existing employees truly align with the company's aim of growth and expansion along with its objective of employee satisfaction and becoming one of the best incentive providers. The organizational strategy also focuses on the short term goals of the company by maximizing its profits and future cash flows. The company would achieve its defined aims and objectives with these long term and short term organizational strategies by excelling in all domains and gaining employees.

## Competency and Ability of Workers in Four Day Work Week

The investments made under current strategy would bring future cash flows which would further make the company more profitable. Keeping employees' perspective in mind this paper involves the in-depth study of the impact of different incentive programs on employee's retention rate and their morale (Simon and Schuster. Ahmad, A. and Salam, S., 2015)

### 1. Research and Discussion- Four day work week and work efficiency

Work culture is paramount for a good mental health of employees and giving a four day work week has been proving phenomenal in this regard. Employee incentive programs have been the main strategy for employee retention in the work industry. The strategic plans of companies have been in line with the company's aims and objectives. The markets factors have been taken into account while defining the company's long term vision and the company aims at monitoring this to establish a long term gain scenario for the employees as well as the stakeholders. The tools used by the company include the continuous performance monitor at all the levels starting from measuring the individual performance to team performance. The company's aims and objectives are also analyzed to check if the strategic options adopted by the company are in line with its long term vision. The company ensures that the monitoring exercise suggests the modifications in the strategy of required to maintain the interests of the company overall along with its stakeholders.

The team performance plan is designed to meet the strategic objective. The performance plan is adhered by each team in order to achieve the strategic objectives defined by the company's higher management. The performance plan is reviewed by the senior management to ensure that the team is set to perform and fulfil the goals and objectives of the company to help them achieve the set target and profit. The shareholder's interest is also kept in mind while setting the goals and objectives and designing the performance plans. The decision is made at the top and the performance plan drills down at each level to support the higher level goals and objective. So it is based on the top to bottom approach and based on that team performance plans are designed to meet the strategic objectives (Ali, A.Y., Dahie, A.M. and Ali, A.A., 2016).

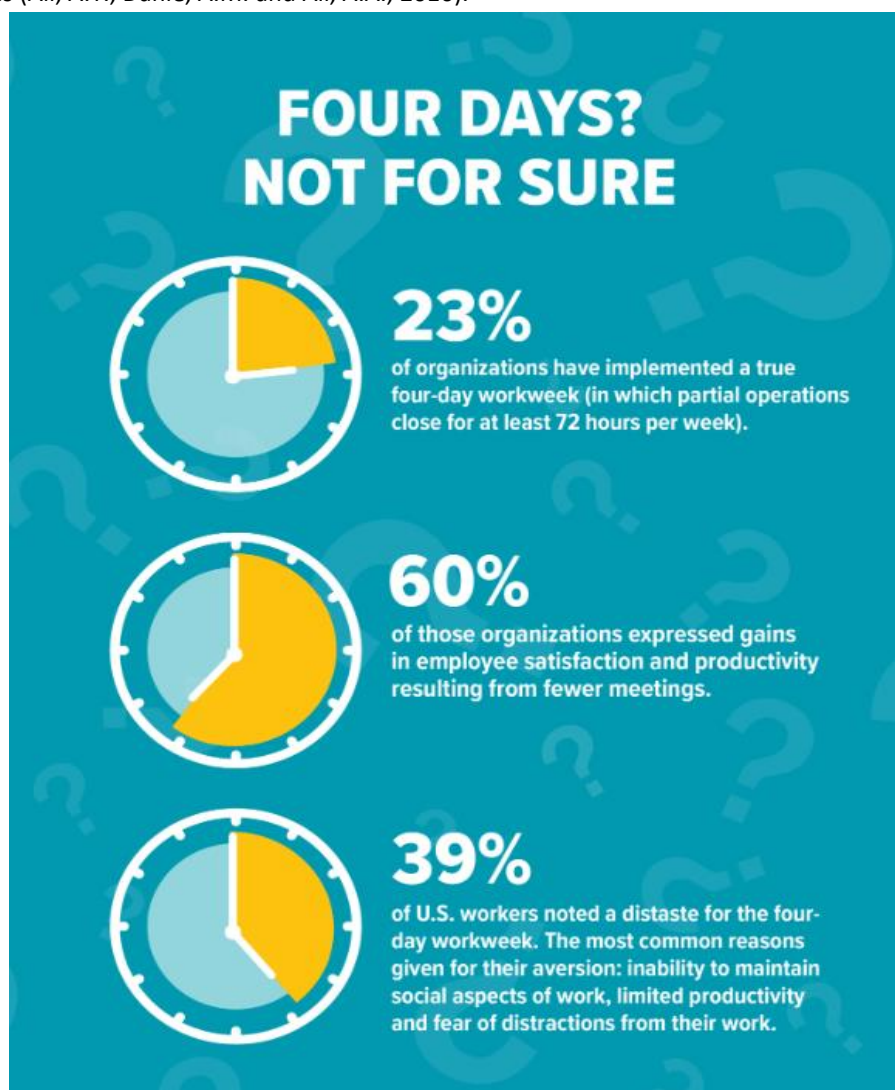


Figure 2: Survey of companies implementing 4-day work week

Source: <https://www.shrm.org/hr-today/news/all-things-work/pages/four-day-workweek.aspx>



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Companies implementing four day work week and their experience with that has been shown in Figure 2. The potential strategic problems of companies would be to overcome the challenges faced by the employees in terms of their satisfaction. Giving the best services in the economical cost is one of the most challenging problems every organisation faces. Further, the competition in the market makes this problem even more difficult by increasing the retention rate of the employees. The company could not simply give lucrative offers to the employees to retain them as the company also has to look into the profit the organisation is expecting and the shareholders' interest as well. So to maintain a balance, the company would need to provide a solution to the employees' problems instead of giving them monetary benefits. The root cause of the problem needs to be sorted instead of fixing the problem in the short run. (Asim, M., 2013).

The long term plan for companies has been on cutting down the retention rate of the existing employees and acquiring the new ones. The company aims to establish a strong base before expanding further and for that the satisfaction of the existing employees is important for the company. The aim of the company is to excel in the field of work services and maintain a brand image for its unique and excellent services. The employee satisfaction would bring more employees and then volume to the sales of the company which would in turn bring profit to the organisation in the long run. The risk assessment has been done for this strategy based on all the existing horizons and the alternatives have been defined based on the options available in the market. The feasibility analysis has also been done to make the strategic objectives a successful attempt to define the company's vision.

Companies is an employee centric company and to measure the team performance target, employee satisfaction index and the number of new employees acquired sums up the criteria for to measure the team performance targets. They use employee satisfaction index, retention rate and percentage of new employees acquired to set team performance targets and the team and individuals are measured against those set targets, The company evaluates the set targets at a quarterly level to make sure the team performance is on track and this timely check on performance metrics helps the team and individuals to modify their strategy in case it is required to achieve the annual targets (Baxter, P. and Jack, S., 2008).

Employee retention rate is continuously monitored in companies to make sure there is not an abrupt trend due to any change in management strategy. The employee feedback team makes a note of all the feedbacks and that data is used to analyse the main reasons for the retention. The strategic plans of companies aim at fulfilling company's long term goals and objectives. The planning done by the organisation is at all the levels. The company believes that for a stable growth and development of the organization, an around planning is required which would take care of the company's vision in both long and short terms. The company's strategic plan of reducing the retention rate in the short term and acquiring the new employees in the long run along with gaining the employees; trust is the fundamental factor in achieving the organizational objectives. The planning of the company has been always in line with the organizational objectives and the continuous monitoring ensures the achievement of that goal (Bipp, T. & Kleingeld, A., 2011).

The wider market in work industry has been phenomenal in defining the company's strategy. The competitor analysis has been done by the organization to understand the available services offered by the market with respect to the employees' satisfaction. The company has explored different strategic options to achieve competitive advantage in the market and has been successful in defining its strategy accordingly. The strategic options chose by the company has been beneficial in defining the horizons of growth and establish a path of growth and expansion further down the line. The competitor impact has been negligible for companies as the company believes in creating an incentive program for its employees and establishes a different image. The company wants to set up its own area of expertise and offers to create a comprehensive yet unique platform for incentive in the work industry compared to its competitors across the world.

Long term growth is one of the most important parameters for any employee to make a decision on which company to choose. Amongst the multiple works offering various offers, companies need to establish a unique career growth to lure the employees. Making the employees choose your incentive from a list of multiple incentive providers available in market is a tough job and to gain the employees in the long run, incentive program need to be maintained. This is the only way to retain the employees. This project will conduct an in-depth study on the incentive program of companies, compared with the other work incentive providers in the market. A detailed analysis would establish a relationship between the employee retention rate and the incentive program of the companies.

The scope of the study pertains to the importance of reducing employee retention at Work to retain the current employees and to attract new employee segments. The retention rate reduction will assist the business to thrive as a leading work across the UAE Aviation industry as well as transforming on a global scale. The incentive program is an important factor in reducing the retention rate in companies because employees will find it beneficial and keep using their incentive depending on the perceived quality. The prospective employees will keep increasing at a consistent growth rate for companies with incentive program improvements, strengthening the existing incentive program measures and/or practices, as well as newer actions.

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The study variables are employee retention which is the dependent variable subject to change from the perceived incentive program which is the independent variable. The interrelationship between the variables is the primary emphasis of the research study. The variables in the study will be excluded based on the criteria of employees that have not used companies in a very long time. The most recent visit could be right before the COVID pandemic or even after the stringent travel regulations were reduced. The participants will be directly included if they have travelled in companies in the recent three months.

Limitations of the study are that the study is subjective to biases as it is responded by different employees who might have not gone to companies, or simply because they prefer incentive program in another work. However, it can be applied in further studies by expanding the number of samples. The online survey questionnaire has the risk of biased responses due to a lack of directly conducting the survey questionnaire (Chintaloo, S., and Mahadeo, J. D., 2013).

### 2. Result and Conclusion

Four day work week has got a mixed response from the companies and employees across the world. Though it has proved beneficial for most of the population, some people also think that it breaks the work momentum during the 3 day weekend break. The strategic objective of companies has been defined by the company's aims and objectives. The position of organisation has been a benchmark in designing the company's strategy and defines its long term goal and objective. The accomplishment of the company's objectives highly depends on the position held by the organization and its brand name in the market. If the company is in the middle of establishing its brand name and is on the path of expansion, it would be not so easy to accomplish the objectives in that case compared to the situation when the company has a well established brand name in the market. The different strategic options chosen by the company focuses on reducing the retention rate. The aim is to provide the best telecom services to win employees' trust and satisfaction and try to acquire new employees based on the best services records. The company has been fundamentally strengthening its base and has been excelling in accomplishing its strategic objectives with these strategic options. The current position has helped the company a bit in achieving those objectives. The company's strategic objective of growth and expansion is supported by the strategic options chosen by the company with its medium and long term perspectives. The organisation has been doing phenomenal with these strategies and would continue to do better by accomplishing its defined goals and objectives (Derfuss, K., 2016).

Incentive program in companies is one of the most important metric in measuring employee's satisfaction. Companies are one of the leading incentive providers in Asia, Africa and Middle East. The company has defined its aims and objectives to further establish its brand across the nations. The strategic planning of the company is highly dependent on the defined aims and objectives of the organization which further determines the approach adopted for creating those strategies. The organization strategy is based on medium term and long term gain which helps in further strengthening the vision of the company. The aims and objectives of the organization have been aligned with the strategic planning and the approaches adopted for fulfilling the long term vision of the company has been in sync the company's expansion plan would work with this strategic planning and the aims and objectives would also be satisfied with this approach. The company would continue to expand by acquiring new employees and limiting the retention rate for the existing employees (Fu, W. and Deshpande, S.P., 2014).



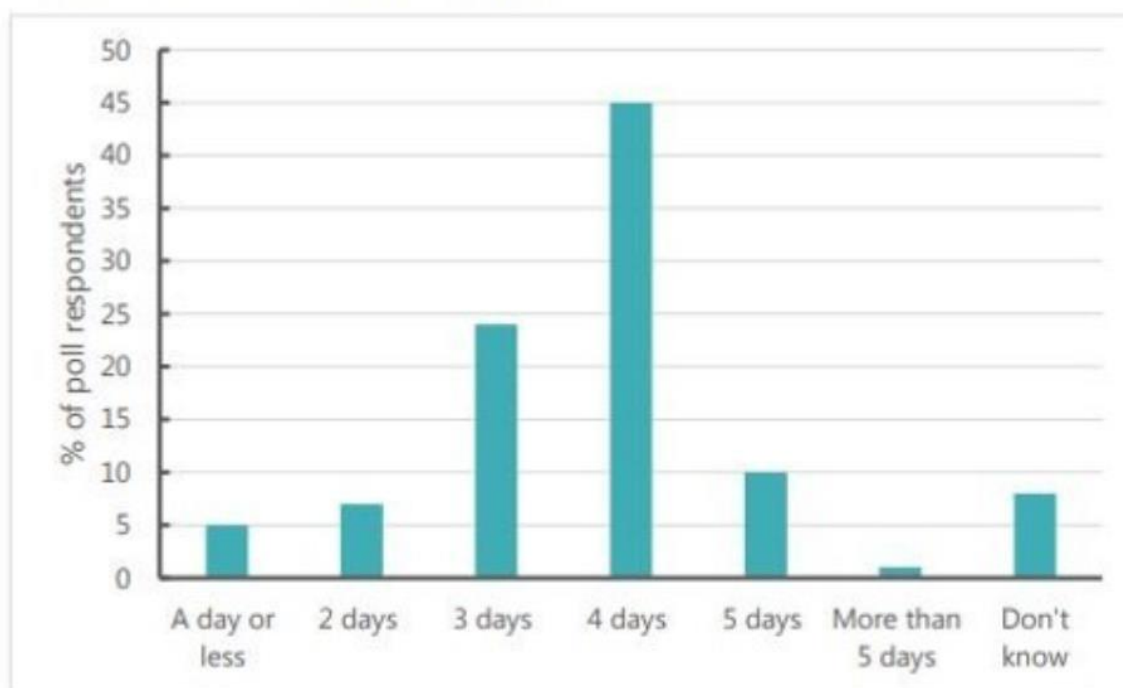
**Figure 3: Pros and cons of 4-days work week**

**Source:** <https://www.zenefits.com/workest/the-4-day-workweek-pros-and-cons/>

Four day work week has its own pros and cons as shown in Figure 3. The long term strategy made by companies would be dependent on the effectiveness of the employees’ retention rate. Here, the primary research methodology is to use a survey questionnaire created online. The link to the survey questionnaire will be shared with the respondents. The respondents will be the employees of companies. The sample will be selected with a random sampling method. The sampling method used is random sampling on the employees that travelled in work during a certain period. The variables will help to determine how the incentive program impacts employee loyalty which will lead to an increase or decrease in employee retention rate. This analysis will serve as the basis for developing multidimensional models to improve the incentive program from various perspectives (Allyn & Bacon, Hall, Tracy and others, 2007).

The secondary research methodology chosen for the research study is to perform secondary research. The secondary research objective is to use the previous researches from scholarly databases like Google scholar, scholars epub, JSTOR, etc. From these databases, the relevant keywords are entered to search for the latest research articles within the last five years. The findings from these studies are used to draw meaningful conclusions about the incentive program and reducing the employee retention rate. The secondary research methodology will be used to conduct the bibliographic review with scholarly articles on the subject matter in correspondence to companies. Workers’ preference also matter here as shown in Figure 4.

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**Figure 4: Workers' preference on number of working days**

**Source:** <https://www.weforum.org/agenda/2018/09/a-four-day-working-week-on-full-pay-technological-advances-could-make-it-possible/>

Further, the data collected also systematically analyses the financial impacts of the business sector in the world and its adaptive approach to the numerous external and internal challenges. This includes COVID-19-related factors such as interest of employees in online versus on filed jobs, availability and access of online learning platforms to the employees across the globe and the effectiveness and learning outcome of the new way of learnings. It also makes several short-term proposals, including introducing initiatives in the business sector to cope with the recession and to reduce detrimental financial effects and new market disruptions in the medium-term. (Hameed, A., and Waheed, A. 2011)

### 3. Future Scope

The paper has studied the available programs for the employees and proposes the existing gaps in the industry which could otherwise help in further increasing the employees' retention rate. The stakeholders' expectation in companies has been clearly defined with the company growth and expansion plans. The company believes in inclusive growth and takes care of the interest of the stakeholders to achieve the long term stability as after all they are the people who set the base and benchmark for the company and help the organisation in building its brand name. The company's strategic planning has been in sync with the stakeholder's expectations and requirements along with the interest of the company's goals and objectives. Both have been satisfied with the strategic planning of the organization which is a beneficial scenario from all the perspectives. The different horizons explored while planning the company's strategy has brought further meaning to the planning of the company's vision and establish a long term relationship with the stakeholders' in harmony (Haque, M.F., Islam, and Md., Haque, M.A., 2014).

Every team has a structure which includes employees working at an analyst or employee support levels who are delegated certain set of task for their supervisors. Their supervisors mentor them based on the set targets for each individual. The supervisors act as a coach to their subordinates and train them to achieve their set objectives. The aim of this structure is to formalize the set of works in an organized manner to ensure every individual is working on track to achieve the target set for the team. Everybody has special skills which are utilized here to work as a team and perform as a team to achieve the strategic objectives set for the team. Companies have planned its objectives well every year to grow at a steady rate. The company has slowly gained the trust of the employees to create a niche market by serving best telecom services and employee support. The employee satisfaction and acquisition of new employees has been the planned objectives of the company. The company is in the middle of its growth path and similarly the planned objectives have also been achieved partially with the brighter future scope. The company plans to continue this rate of growth and expansion to acquire more employees and establish its brand image. The further growth and

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expansion of the company is in the planned objective which is supposed to be achieved in medium term from now (Halepota, 2005).

### 4. Challenges and Limitations

Four day work week policy still needs to be improvised as per the organisational requirement. Though the incentive programs are highly instrumental in increasing employees' retention rate, there are challenges which need to be taken care of. Works industry in UAE is highly competitive and Work is one of the leading incentive providers in the market. The current performance is the benchmark for companies in defining the performance targets within teams. The aim is always to beat the current performance and do better in every financial year. The company sets individual targets by dividing the overall target set for the year. The individual targets are then monitored regularly to make sure that the performance is on track and the defined target would be met at the end of the year. Further, this overall target is calculated by adding a certain extra percentage to the current performance which was earlier defined as the benchmark for the team. The company strives to maintain a balance between team's growth and performance by aligning the company's objective as per the strategy defined by the higher management.

The potential problems of companies could be the struggle in achieving employee's satisfaction as the market and the government has different rules for different nations. The company would find it difficult to standardize its strategy and objectives as different countries would pose different challenges to the organisation. The future growth and expansion would highly depend on the business environment of the developed and specially developing nations. The selected strategy by the company mainly focuses on a detailed research of the employees and the work business market of the nations before planning to venture in the new market. The detailed research would establish and highlight the existing problems which focus on establishing a considerable solution to cater to the problems (Khodov, L., 2003).

The risk of having a consumer in this situation is that their reaction damages the image of the company, or that it generates a boycott against the products or services of the organization. In short, the importance of quality in incentive is indisputable. The competitive advantage of employee incentive program is critical because it can make a difference in any market or organization. This could lead to consumers' propensity towards a brand and any poor practices will directly cause the employees to their direct competitors. Meeting strategy is of prime importance to the company and honest feedback is given after accessing the performance of the teams. Criticism is important parts of feedback which keeps the work in check and helps the employees in maintain their efforts in the right direction.

The need for the study is to evaluate the existing incentive program measure implementations within companies. They are comprehensively evaluated in the study in comparison with industry standards to help the organization meet the incentive program exceeding these standards in lacking areas. Companies can use the findings from the study for reducing the employee retention rate by increasing the incentive program of the aviation company. It is necessary for the business to sustain, and thrive in the UAE work industry as the leading work amongst its competitors. The organization also requires the assessment of the current practices to improve incentive program, value-added services to improve the incentive program, as well as in retaining the employees. The results of the research will be useful for companies to scale up its operations in meeting the demands of a transforming contemporary employee segment. Currently, there is great business competitiveness as users are more demanding when selecting a product or service, as a consequence companies pay more attention to factors such as quality of service, job satisfaction, employee satisfaction, etc., hence the interest in performing the present investigation. With these measures, it retains the most profitable employees and therefore improves the quality and sustainability of the current portfolio in addition to reducing retention rates. This study is important for the key stakeholders of companies, the employees of work, employees working at the companies, and other competitors of the companies. The research results will ensure a long and successful relationship with their employee in the context to obtain excellent incentive which solves their need to the business and carries out its job (M.S., 2015).

Problem is associated with attaining employee satisfaction as the foundation of quality management systems in reducing employee retention rate. Employees need goods and services that satisfy their needs and specifications. Employee specifications may be set by the Employee on a contractual basis or by the company itself. But in either situation, the acceptability of the product may essentially be determined by the employee according to the quality offered by Work ranging from check-in, baggage, to boarding, and in-flight services. To orient Quality Control Processes towards employee loyalty, the amount of satisfaction obtained needs to be calculated. Different methodologies and models exist to assess employee loyalty.

The management of companies generates a product from which a certain quality is required, determined by the employee's view of the operation and how they are treated. The same goes with the internal consumer who needs to be handled by quality expectations and represents the picture that the outside consumer perceives when the product is purchased. The loyalty of

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consumers is a crucial indicator of measuring the organization's overall success to develop a culture of quality development of management. After all, efficiency matters the most and not the number of working days in a week.

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## Feed Additive Vegetable Oil, Addition to Commercial Feed on the Feed Efficiency and Fat Content of Red Tilapia (*Oreochromis Niloticus*)



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**ABSTRACT:** This study aims to determine the effect of conventional vegetable oil as feed additive, according to soybean oil, coconut oil, corn oil, and the effect of feed efficiency, feed conversion ratio (FCR) and fat content of red tilapia. Feeding trial in this study had used Completely randomized design (CRD), with 4 treatments and repeated 4 times. Red tilapia as much as 160 used initial weight of 25-40g/head, kept in an aquarium with a volume of 20 dm<sup>3</sup> with density 2 ind./L, and fed a pelleted with addition vegetable oil for 40 days. The results showed that there was a significant difference ( $p < 0.05$ ) in Feed Efficiency (FE), and Feed Conversion Ratio (FCR). The highest EPP value in treatment addition soybean oil 4% was 66.06% ( $P < 0.05$ ), and then treatment corn oil (47.28%), while the control treatment not addition of vegetable oil gave FE as much as 46.70%, and coconut oil was 39.60%. The best FCR value in treatment addition soybean oil 4% as much as 1.52 ( $P < 0.05$ ), while feed additive corn oil was 2.23, control was 2.17, and coconut oil was 2.27. Feeding with the addition of 4% soybean oil was the best treatment for growth, while the addition of coconut oil and corn oil increased the fat content of fish descriptively compared to without the addition of oil.

**KEYWORDS:** Red Tilapia, Soybean Oil, Coconut Oil, Corn Oil, Fat

### I. INTRODUCTION

One of the fishing communities Indonesia which has a bright prospect to be developed is tilapia (*Oreochromis niloticus*) which has been known long known, relatively fast growing and have a good response to environment so it is very easy to cultivated [1]. In terms of eating habits, tilapia is an all-eating fish (omnivorous) so easy to give additional feed. The crude protein requirement of red tilapia ranges from 25-35 percent. The fatty acid requirement of tilapia, according to [2] is from unsaturated fatty acids of the omega 6 group, which is as much as 0.5-1 percent. Materials that contain lots of fatty acids, both saturated and unsaturated, one of which is PUFA omega 6 are from seeds and vegetable plants. PUFA is one type of essential fat, because the body cannot synthesize it while the body needs PUFA for normal growth and function of all tissues. Apart from being an easily available source, there are also various commercial sources of vegetable fats, such as coconut oil, corn oil, and soybean oil. In addition, fat in feed also provides essential fatty acids (EPA) needed for growth, normal development and helps the absorption of various types of fat-soluble vitamins [3]. According to [4], lack of essential fatty acids will result in decreased growth rate, decreased feed efficiency, increased feed conversion ratio, increased mortality or mortality.

World vegetable oil consumption in 2011-2012 reached  $\pm$  150 million tons. 114.2 million tons are used in the food sector and 35.8 million tons in the non-food sector [5]. Vegetable oils can be better absorbed by fish body tissues and can also affect fish growth, feed efficiency, and also fat content in fish. Various methods in making feed, one of which is by adding vegetable oil to meet the fat needs of red tilapia. Fat is one of the energy sources that must be available in feed. Determination of the source of fat in the feed is important in terms of the efficiency of the feed used. Oil is a source of fat that is still widely used in feed. Different types of oil have different effects on fish. This study aims to determine the effect of adding vegetable oil (soybean oil, coconut oil, corn oil) in feed to feed efficiency, feed conversion ratio, and fat content of red tilapia, the oil was chosen because it is easier to obtain in the market and also contains fatty acids. which is quite high.

# Feed Additive Vegetable Oil, Addition to Commercial Feed on the Feed Efficiency and Fat Content of Red Tilapia (*Oreochromis Niloticus*)

## II. MATERIALS AND METHODS

This research was conducted from February 2022 to March 2022 in Aquaculture Laboratory Faculty of Fisheries and Marine Sciences, Padjadjaran University, Indonesia. The research used was experimental with a Completely Randomized Design (CRD). Treatment A: Control (without the addition oil), Treatment B: Addition of 4% soybean oil, Treatment C: Addition of 4% coconut oil, and Treatment D: Addition of 4% corn oil

Parameters feed efficiency and feed conversion ratio were tested using analysis of variance/F test and further tests using Duncan's test to see the effect of treatment on each parameter to be tested, at a 95% confidence level. Fat content parameters were analysed descriptively.

### A. Research Procedure

Preparation of research tools begins with cleaning the aquarium and checking equipment for adding oil to fish feed. Aquarium rinsed with water, then dried and labelled according to treatment. Addition of oil to fish feed by providing soybean oil, coconut oil, corn oil and commercial pellets, the pellets are then mixed with carboxy-methyl cellulose (CMC) feed adhesive is then dried in the sun or in the oven. The test fish used in this study was Red Tilapia, sized 12-14 cm with an average weight of  $40.41 \pm 0.43$  g/head. The fish are adapted to the new environment first and the feed will be given in a tank with a volume of 20 liters. Then transferred to the rearing container as many as 15 test fish per fibres tub with a volume of 240 liters which had previously been weighed. Feeding as much as 3% of fish biomass was carried out at 08:00 West Indonesian time and 16:00 West Indonesian time. Siphoning is carried out every day, while water changes are carried out 4 times a day as much as 35% of water with water that has been deposited first. Maintenance was carried out for 40 days of observation. At the beginning and end of rearing several fish samples were taken for proximate analysis.

### B. Research Parameters

#### Feed Efficiency

The formula used to calculate feed efficiency by [6] :

$$EP = \frac{(Wt + D) - Wo}{F} \times 100\%$$

Information:

EP = Feed efficiency (%)

Wt = Final fish weight (g)

Wo = Initial fish weight (g)

D = Dead fish weight (g)

F = Amount of feed consumed (g)

#### Feed Conversion Ratio

The feed conversion ratio of red tilapia seeds was measured based on the feed conversion ratio formula developed by Kamaruddin (2005):

$$FCR = \frac{F}{(Wt + D) - Wo}$$

Information:

FCR = Feed Conversion Ratio (%)

Wt = Final fish weight (g)

Wo = Initial fish weight (g)

D = Dead fish weight (g)

F = Amount of feed consumed (g)

### C. Data analysis

The data obtained were then tabulated and analyzed using variance analysis (ANOVA) to determine the effect of each treatment. If there were differences between treatments then Duncan's multiple distance test was carried out with a confidence level of 5% [8].



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### III. RESULTS AND DISCUSSION

#### A. Feed Efficiency

The efficiency of the use of feed by fish shows the value (percentage) of food that can be utilized by the animal's body [9]. The efficiency of feeding is directly proportional to the addition of body weight, so the higher the value of feeding efficiency means the more efficient the fish use the feed consumed for growth [10]. The feed can be said to be good if the feeding efficiency value is more than 50% or even close to 100% [11].

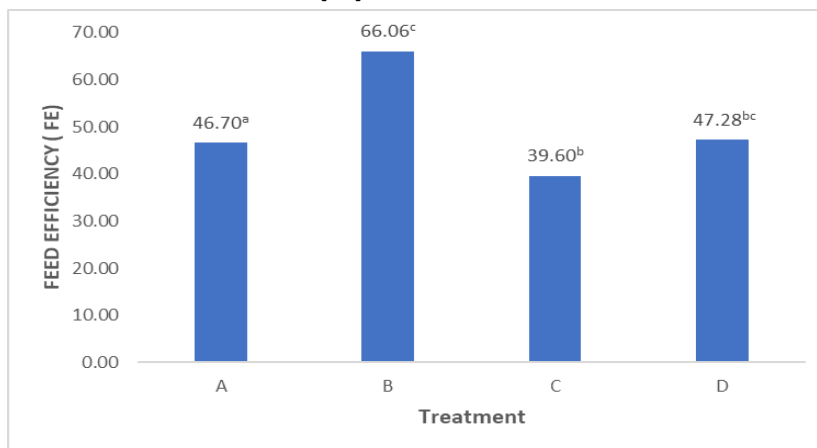


Figure. 1 Diagram of Feed Efficiency

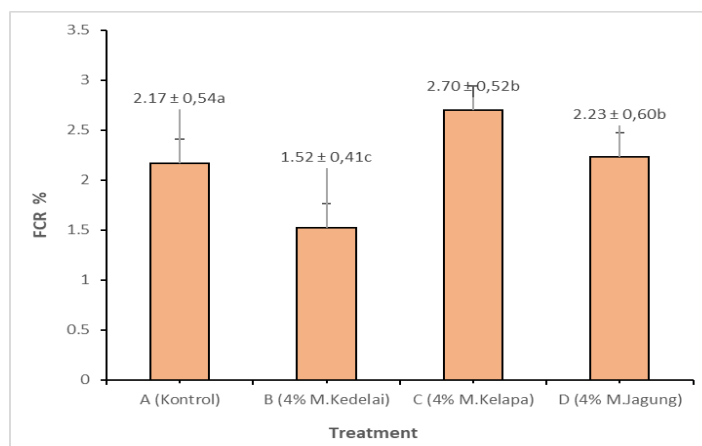
The efficiency value of adding vegetable oil to red tilapia obtained the highest value in Treatment B (soybean oil) with a value of 66.06% followed by treatment D (corn oil) with a value of 47.28%, then followed by treatment A (control) with a value of 46.70% and the lowest was followed by treatment C (coconut oil) with a value of 39.60%. This shows that the adaptation of feed with the addition of soybean oil is getting better by red tilapia during rearing. This can also be because the addition of soybean oil to commercial feed can be digested well by red tilapia, so that even in addition to 4% levels it can increase the growth of red tilapia.

Feed utilization efficiency is the ratio between body weight gain and the amount of feed given during maintenance [12]. Feed efficiency value in each treatment during the research only treatment b classified good (66.06%). Treatment with the addition of vegetable oil showed an increase and decrease in several weeks of maintenance, which was directly proportional to the higher specific growth rate according to the treatment. According to [13], that one of the indicators used to assess the level of efficiency of feed given to fish is feed digestibility. This markedly reduced digestibility of saturated fats could explain the absence of higher levels of saturated fatty acids in the liver, lipid droplets in enterocytes and muscle of fish fed diet could be due to the lower fat digestibility of this diet. The use of coconut oil, was decrease feed efficiency. (39.60%). A decrease in the ratio of polyunsaturated/saturated fatty acids in the diet lead to a reduction of the apparent digestibility not only of saturated fats but also of other fatty acids[14].

#### B. Feed Conversion Ratio

Based on the results of research on red tilapia seeds during the 40-day rearing period, it was found that differences in the addition of soybean oil, coconut oil, and corn oil to commercial pellets resulted in differences in the FCR value in each treatment, along with the FCR value in each treatment.

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**Figure. 2 Diagram of Feed Conversion Ratio**

The results of the calculation of data analysis show that the value with the lowest treatment is treatment B, the highest treatment is A. The figure also shows that the FCR value in treatment B looks lower than the other treatments, which is 1.52% and the highest FCR value is by treatment C (control) of 2.70%, followed by treatment D at 2.23% and then treatment A by 2.17%. In soybean oil the saturated fatty acid content ranges from 15% while for corn oil it ranges from 13% and for coconut oil it ranges from 90% [15]. This can make the FCR value of coconut oil high compared to soybean and corn oil, because according to [16], fat digestibility in fish increases according to the decrease in the melting point of the fat in question, for example with an increase in unsaturated fatty acids and also in accordance with the opinion of [5]. That fat digestibility is influenced by the level of fat saturation which is generally fish. It is easier to digest unsaturated fats so that saturated fats are said to have low digestibility for fish.

It can be concluded that the addition of vegetable oil at a dose of 4% is still accepted by the body of the red tilapia, where the fat retention in red tilapia in this study can store and utilize fat in the feed that has been added with oil. Fat retention in fish indicates the ability of fish to store and utilize fat in feed [17]. Fat retention is also related to the levels of carbohydrates and fats in the feed as a source of energy for the fish. Fat is stored as a reserve for long-term energy needs during periods of activity or during periods without food and energy [18].

### C. Crude Protein and Crude Fat Content in Fish Meat

The following is the result of the proximate analysis crude protein and crude fat, of meat fish of Red Tilapia at the end of the study, the treatment without the addition of 4% coconut oil, corn oil and without the addition of oil (control).

**Table 1. Proximate Analysis**

NO	Treatments	Moisture %	Crude Protein %	Crude Fat%
1	A : Control, without feed additive	76.90	18.84	8.75
2	B : Feed additive soybean oil	80.72	17.00	8.20
3	C ; Feed additive coconut oil	80.59	16.95	9.25
4	D ; Feed additive corn oil	80.42	16.49	6.36

The results of the proximate test showed an increase in fat content in red tilapia through the addition of fish oil to the feed for 40 days of rearing. The fat content of red tilapia in treatments A, C, and D was 8.75%, 9.25%, 6.36%. The difference between the addition of oil and the control treatment affects the fat content of red tilapia at the end of the study

Meanwhile, the water content in red tilapia after rearing ended in treatments A, C, and D was 76.90%, 80.59, 80.42% the results were not much different ( $P > 0.05$ ). According [19], stated that red fish meat has a low protein content, but a higher water content. White fish meat has high protein content and low water content. Red tilapia has a meat color that tends to be whiter than other fish that have a higher protein content. Higher water content will also show the texture of fish meat, according to [20]yah et al (2019), the higher the water content in the material, the softer the texture, on the contrary, if the water content in the material is a little, it will be harder.

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Protein levels in red tilapia in treatments A, C, D were 18.84%, 16.95%, 16.49%. In the results of this study, there was no significant difference in the protein content of red tilapia. The level of digestibility of each content in the feed source will affect the content of the fish. The fatty acids contained in the fat used, contribute to fish metabolism which can affect protein. The results of research conducted by [21] showed that protein retention is a parameter to show the contribution of protein consumed in the feed to the increase in body protein. Meanwhile, the addition of vegetable oil to feed containing fatty acids has an effect on protein levels in fish, which is also supported by the research of [22], feeding with fatty acid content in meat *Caranx sp.* fish affects its protein digestibility. One of the functions of protein, namely as a source of energy, has been fully fulfilled through existing fat.

### CONCLUSIONS

Result of variance test on feed efficiency and the feed conversion rate of tilapia feed reared with the addition of soybean oil to the feed gave a good value with the value of feed efficiency (66.06%) and the value of feed conversion rate (1.52) on red tilapia. The addition of 4% vegetable oil to commercial feeds increases the fat content of red tilapia meat.

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## Whistleblowing Intention and Fraud



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**ABSTRACT:** This study seeks to find the key factors that influence whistleblowing intentions. The research was conducted by distributing questionnaires to employees of the Badung Regional Government Education Center who are engaged in finance. The sample selection method used is purposive sampling. Reward, perceived seriousness of fraud, relativism ethical orientation, moral intensity and professional identity have a very important role in influencing a person's whistleblowing intention. Giving rewards, perceived seriousness of fraud, relativism ethical orientation, moral intensity and high professional identity will help increase a person's whistleblowing intention.

**KEYWORDS:** Whistleblowing Intention, Reward, Perception of Fraud Seriousness, Relativism Ethical Orientation, Moral Intensity, Professional Identity

### I. INTRODUCTION

Corruption is still a problem that Indonesia has not been able to overcome. This is evidenced from the data *Corruption Perception Index* (CPI), issued by the rating agency Transparency International, Indonesia which is still far from the "clean" category. With the existence of anti-fraud control, one of which is the whistleblowing system, it can reduce losses caused by fraud and accelerate the detection of these irregularities. Whistleblowing system has been implemented in a few government agencies, for example the Corruption Eradication Commission (KPK) and Ministry Finance (Ministry of Finance). Understanding things that can increase whistleblowing intentions is important so that organizations can design the most effective whistleblowing policies and systems.

First there are rewards. Reward is one of the efforts organization to encourage employee report fraud internally than external (Guthrie & Taylor, 2017). From several previous research results, it was found that there were different results related to reward variables, such as the research conducted by Hariyani, Putra and Wiguna (2019) which stated that rewards had an effect on whistleblowing intentions, while Arwata (2021) stated that rewards had no effect on whistleblowing intentions. .

Second, there is a perception of the seriousness of fraud. Perception of the seriousness of fraud is an understanding of how much seriousness or loss from an act of fraud can affect a person's whistleblowing intention. In a study conducted by Nugroho, Wahyuningsih and Alliyah (2022) stated that the level of fraud had an effect on whistleblowing intentions, while Setyorini & Donifaizal (2020) stated that the perception of seriousness problems had no effect on whistleblowing intentions.

Third, there is an ethical orientation of relativism. Relativism is a theory which states that an action can be said to be right or wrong based on the views of society. Effendi and Nuraini (2019) stated that the ethical orientation of relativism had no effect on whistleblowing intentions, Janitra (2017) stated that the ethical orientation of relativism had an effect on whistleblowing intentions, while Aziz and Purwanti (2020) stated that the ethical orientation of relativism had a negative effect on whistleblowing intentions.

Fourth, there is moral intensity. Moral intensity is a variable or construct consisting of the following characteristics: characteristics which is an extension of various issues related to the main moral issues of a situation, which then can affect an individual's perceptions and beliefs about things he then believes and believes (Husniati, 2017). Several studies have stated that moral intensity has an effect on whistleblowing intentions, including research conducted by Anggraeni (2021), but Puspitosari (2019) stated that moral intensity has no effect on whistleblowing intentions.

Finally, there is a professional identity. According to Mael and Ashforth (1992), professional identity is the extent to which individuals classify themselves in terms of the work they do and have the characteristic of always assuming other people do the same job. In a study conducted by Khamainy (2021) stated that professional identity had an effect on whistleblowing intentions,

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while Iqbal, Mukhtaruddin and Kosim (2018) stated that professional identity had no effect on whistleblowing intentions. Differences in research results are caused by several factors, for example, organizational culture, selection of respondents, and sampling methods. Researchers are interested in conducting research on intentions *whistleblowing system*. This research raises the title "The Influence of Rewards, Perceptions of Seriousness of Fraud, Relativism Ethical Orientation, Moral Intensity and Professional Identity on Whistleblowing Intentions to Reduce Fraud in Badung Regency Government Funds"

## II. LITERATURE REVIEW

### 1. *Prosocial Organizational Behavior Theory*

*Prosocial organizational behavior theory* as behavior/actions taken by members of an organization against individuals, groups, or organizations designated to improve well-being individual, group, or organization (Brief and Motowidlo, 1986). According to Dozier and Miceli (1985), prosocial behavior is positive social behavior that is intended to provide benefits to others. According to Brief and Motowidlo (1986), whistleblowing is a form of prosocial organizational behavior. This opinion is in line with Dozier and Miceli (1985), who stated that whistleblowing is a prosocial behavior because in general, whistleblowing will provide benefits for both the organization and the whistleblower from fraud.

### 2. *Planned Behavior Theory*

*Theory of Planned Behavior* every whistleblowing action will be carried out by the individual if there is a fraud that occurs and must be reported. It is also explained by Ajzen (1991), the theory of planned behavior explains that interest is a function of two basic determinants related to personal factors and social influences.

### 3. *Whistleblowing*

*Whistleblowing* is an act of disclosure by members of an organization about practice illegal, immoral in an organization (Miceli and Near, 1985). Whistleblowing can be measured with the following indicators (Efendi, 2019):

- 1) There are indications of fraud
- 2) High loss impact
- 3) Disclosure planning
- 4) Doing whistleblowing through internal or external channels
- 5) Sacrifice

### 4. *Rewards*

According to Sastrohadiwiryono (2002), *rewards* is compensation for services provided by the company to workers, because these workers have contributed energy and thoughts for the progress of the company in order to achieve the goals that have been set. Based on research Arwata (2021), *reward* can be measured by the following indicators:

- 1) Award
  - Giving rewards to the best employees makes me motivated to work even harder
  - Structural allowances given to employees are in accordance with applicable regulations
- 2) Bonus
  - Payments other than the basic salary such as overtime pay or others such as rewards have been given in accordance with the tasks carried out by the employees

In Fauzi's research (2018), the category *rewards* consists of 2 (two) categories, namely there is a reward and there is no reward.

### 5. *Fraud's Seriousness Perception*

The seriousness of fraud can be defined as the effect where it is likely the result of a violation whether measured on a financial or non-financial basis. A dominant person will examine the level of loss or seriousness of an act of fraud before reporting it, a dominant person will report a fraud if it results in a high impact on the agency (Miceli & Near, 1985). The perception of the seriousness of fraud can be measured by the following indicators (Islamiyah, 2018):

- 1) The concept of materiality
- 2) Error consideration

### 6. *Relativism Ethical Orientation*

Forsyth (1980) argues that ethical orientation is the main goal of professional behavior which is closely related to morals and prevailing values and is driven by two characteristics, namely idealism and relativism. Relativism is a theory which states that an action can be said to be ethical or not, right or wrong, which depends on the views of society. The ethical orientation of relativism can be measured by the following indicators (Efendi, 2019):

- 1) Various ethics

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- 2) Different types of morality
- 3) Code of ethics considerations
- 4) Behavioral assessment

### 7. Moral Intensity

Moral intensity is a construct that includes characteristics which are an extension of the issues related to the main moral issues in a situation that will affect the individual's perception of ethical issues and behavioral intentions they have. According to Jones (1991), there are six elements:

- 1) *Magnitude of consequences*
- 2) *Probability of effect*
- 3) *Temporal Immediacy*
- 4) *Concentration of effect*
- 5) *Proximity*
- 6) *Social consensus*

### 8. Professional Identity

Aranya, et al., (1981) defines professional identity as a person's strength with his involvement in a profession. Professional identity represents attitudes in the theory of planned behavior. Attitude is a state in humans that can move humans to act or not act. Professional identity in this study was measured using the professional commitment scale developed by Aranya, et al., (1981). Based on research conducted by Safitri (2018), professional identity can be measured by the following indicators:

- 1) Comply with professional regulations
- 2) Similarity with the profession
- 3) Caring about the image of the profession
- 4) Proud of the profession
- 5) Feeling happy with the choice of profession

## III. METHOD

This research is a review of the concept of influence *rewards*, perception of the seriousness of fraud, relativism ethical orientation, moral intensity and professional identity to whistleblowing intentions. This review was conducted to deepen the aspects that influence whistleblowing intentions in order to reduce fraud in Badung Regency government funds. Some of the literature reviewed are as follows:

**Table 1. Literature Discussion**

No	Name/Year/Title
1	Hariyani, Putra and Wiguna (2019) <i>"The Influence of Professional Commitment, Ethical Considerations, Personal Costs, Rewards on Internal Whistleblowing Intentions (Empirical Study on Siak Regency Opd)"</i>
2	Febianti, Purnamasari & Hernawati (2020) <i>"The Influence of Moral Competence and Rewards on Whistleblowing Intentions"</i>
3	Nugroho, Wahyuningsih and Alliyah (2021) <i>"The Influence of Personal Cost and Fraud Levels on Interest in Whistleblowing With Attitudes Towards Whistleblowing As Moderating Variables"</i>
4	Pulungan, Afriani and Hasudungan (2020) <i>"Do financial incentives and perceptions of seriousness affect the decision of state civil servants to carry out whistleblowing?"</i>
5	Janitra (2017) <i>"The Influence of Ethical Orientation, Professional Commitment, Organizational Commitment, and Ethical Sensitivity to Internal Whistleblowing"</i>
6	Khamainy (2021) <i>"Factors Affecting Intention To Whistleblowing Internal At the Sumenep Regency OPD"</i>
7	Nur & Hamid (2018)



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	<i>"The Influence of Auditor Professionalism and Moral Intensity on Intention to Whistleblowing at Makassar Public Accounting Firm"</i>
8	Anggraeni & Haryati (2021) <i>"The Influence of Professionalism, Moral Intensity, and Personal Cost of Reporting on Auditor's Intention to Whistleblowing"</i>
9	Hasanah (2017) <i>"The Effect of Ethical Orientation and Professional Commitment to Whistleblowing"</i>
10	Husniati (2017) <i>"Factors that influence the intention to carry out internal whistleblowing"</i>

### IV. RESEARCH RESULTS AND DISCUSSION

**Table 2. Literature Review Results**

No	Name/Year/Title	Variable						Research result
		X 1	X 2	X 3	X 4	X 5	Y	
1	Hariyani, Putra and Wiguna (2019) <i>"The Influence of Professional Commitment, Ethical Considerations, Personal Costs, Rewards on Internal Whistleblowing Intentions (Empirical Study on Siak Regency Opd)"</i>	<input type="checkbox"/>					<input type="checkbox"/>	Professional commitment, ethical considerations, personal costs and rewards affect internal whistleblowing intentions
2	Febianti, Purnamasari & Hernawati (2020) <i>"The Influence of Moral Competence and Rewards on Whistleblowing Intentions"</i>	<input type="checkbox"/>					<input type="checkbox"/>	Moral competence and rewarding affect whistleblowing intentions
3	Nugroho, Wahyuningsih and Alliyah (2021) <i>"The Influence of Personal Cost and Fraud Levels on Interest in Whistleblowing With Attitudes Towards Whistleblowing As Moderating Variables"</i>		<input type="checkbox"/>				<input type="checkbox"/>	Personal cost significant positive effect on the interest in doing whistleblowing, the level of fraud has a significant effect on the interest in doing whistleblowing, the attitude variable towards whistleblowing is not a moderating variable for the interaction between personal cost and whistleblowing variables, but a moderating variable for the interaction between the level of fraud and whistleblowing variables
4	Pulungan, Afriani and Hasudungan (2020) <i>"Do financial incentives and perceptions of seriousness affect the decision of state civil servants to carry out whistleblowing?"</i>		<input type="checkbox"/>				<input type="checkbox"/>	The perception of seriousness has an effect on whistleblowing intentions, while the impact of financial incentives on whistleblowing intentions is not significant
5	Janitra (2017) <i>"The Influence of Ethical Orientation, Professional Commitment, Organizational Commitment, and Ethical Sensitivity to Internal Whistleblowing"</i>			<input type="checkbox"/>			<input type="checkbox"/>	Ethical orientation, professional commitment, organizational commitment and ethical sensitivity affect internal whistleblowing

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6	Khamainy (2021) "Factors Affecting Intention To Whistleblowing Internal At the Sumenep Regency OPD"			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Relativism ethical orientation, moral intensity, organizational commitment and professional identity have an effect on encouraging someone to take whistleblowing actions
7	Nur & Hamid (2018) "The Influence of Auditor Professionalism and Moral Intensity on Intention to Whistleblowing at Makassar Public Accounting Firm"				<input type="checkbox"/>		<input type="checkbox"/>	Professionalism and moral intensity affect the intention to do whistleblowing
8	Anggraeni & Haryati (2021) "The Influence of Professionalism, Moral Intensity, and Personal Cost of Reporting on Auditor's Intention to Whistleblowing"				<input type="checkbox"/>		<input type="checkbox"/>	Professionalism and moral intensity have a significant effect on the auditor's intention to whistleblowing, while the personal cost of reporting has no significant effect on the auditor's intention to whistleblowing.
9	Hasanah (2017) "The Effect of Ethical Orientation and Professional Commitment to Whistleblowing"			<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	The ethical orientation of idealism and professional commitment is significantly positive for whistleblowing, while the ethical orientation of relativism is negative for whistleblowing.
10	Husniati (2017) "Factors that influence the intention to carry out internal whistleblowing"			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The relativism ethical orientation, moral intensity, organizational commitment and professional identity affect the dependent variable

### Empirical Studies

#### *The Effect of Rewards on Whistleblowing Intentions*

According to Elias (2008), *rewards* is about how people are rewarded according to their values in an organization. This includes financial rewards or non-financial rewards. The reward system given by an organization to employees is the policy of the organization, whose manufacturing process and practice for employees is made in accordance with the values of their contributions, skills and competencies to the organization. Reward is one of the things related to whistleblowing, where in general a person's intentions will be affected by the reward given for good actions taken. Likewise, this will affect the whistleblower, if the reward received when doing whistleblowing is enough to attract his attention, then the intensity of someone doing whistleblowing will increase. Hariyani, Putra and Wiguna (2019), Febianti, Purnamasari & Hernawati (2020) and Usman & Rura (2021) stated that rewards have a positive effect on whistleblowing intentions.

#### *Influence of Fraud Seriousness Perception on Whistleblowing Intention*

Lestari (2018) mentions that *seriousness fraud* has similarities with one of the moral intensity models developed by Jones (1991). *Fraud seriousness* can be defined as the possible effect of financial and non-financial measures of fraud. This means that by knowing the consequences arising from the existence of a violation, it can be measured both qualitatively and quantitatively. Perceptions of the seriousness of fraud can be assessed from how much loss an organization has experienced. Individuals tend to report more serious fraud than less serious fraud. This happens because of the individual's perception that the organization will suffer greater losses if it is not reported immediately. Several studies, such as that conducted by Wahyuningsih, Alliyah & Nugroho (2022), Pulungan, Afriani & Hasudungan (2020) and Saputra (2021) state that perceptions of the seriousness of fraud have a positive effect on whistleblowing intentions.

#### *The Effect of Relativism's Ethical Orientation on Whistleblowing Intentions*

Relativism is an attitude of rejection of absolute moral values in directing behavior. In this case, the individual still considers several values from within himself and the surrounding environment (Forsyth, 1980). Ethical relativism is a theory which

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states that an action can be said to be ethical or not, right or wrong, which depends on the views of society. If a person's relativism is low, they will have a level of viewing whistleblowing as unimportant and have a tendency not to do whistleblowing. Several studies such as those conducted by Khamainy (2021), Husniati (2017) and Janitra (2017) states that the ethical orientation of relativism has a positive effect on whistleblowing intentions.

### *The Influence of Moral Intensity on Whistleblowing Intentions*

Husniati (2017) cites that Zubair (1987) defines moral intensity as the strength or weakness of feelings of distress or pleasure as a result of an act of good or bad, wrong or right, and fair or unfair. Moral intensity can be related to the concept of perceived behavioral control in the theory of planned behavior. Perception of behavioral control is a person's belief that the perception he has is the result of his own control over the perception of the behavior. Jones (1991) identified that moral intensity affects a person's decision-making process and the level of moral intensity varies. Someone who has a high moral intensity will be more likely to report violations that occur because they have a sense of responsibility to report it.

### *The Effect of Professional Identity on Whistleblowing Intentions*

Aranya, et al., (1981) defines professional identity as a person's strength with his involvement in a profession. Professional identity represents attitudes in the theory of planned behavior. Attitude is a state in humans that can move humans to act or not act. One of the attitudes of a staff/employee to show a professional identity is through compliance with the legal basis for implementing employee discipline as regulated in Chapter II Article (2) of Law No. 43 of 1999. Professional identity is also associated with the intention to conduct whistleblowing. A person who upholds his professional identity will encourage the formation of an obedient attitude to the legal basis for implementing discipline or rules of conduct, and in order to protect his profession, someone will feel more responsible if there is a violation of the applicable regulations to cause the intention to do whistleblowing. Several studies such as those conducted by Husniati (2017), Khamainy (2021), Hasanah (2017) and Hariyani & Putra (2018) state that professional identity has a positive effect on whistleblowing intentions.

## V. CONCLUSION

*Rewards* affect the whistleblowing intention of the financial staff of the Badung Regency Government Center. Rewards can be in the form of financial or non-financial, many agencies implement this policy to improve the performance of their employees, one of which is to foster whistleblowing intentions. However, there are also agencies that do not apply a reward policy, but this does not rule out the possibility of whistleblowing.

Perception of seriousness *fraud* affect the whistleblowing intention of the financial staff of the Badung Regency Government Center, which indicates that the seriousness of an act of fraud affects a person's perception which can foster whistleblowing intentions. This also proves that there is a sense of responsibility to protect the agency where they work to avoid losses due to an act of fraud.

The ethical orientation of relativism affects the whistleblowing intention of the financial staff of the Badung Regency Government Center. No matter how small an act of fraud, it must be prevented immediately before it results in greater losses for an agency. Each individual has their own view of an action that can be categorized as right or wrong.

Moral intensity affects the whistleblowing intention of the financial staff of the Badung Regency Government Center. This shows that an act of fraud affects the morality that exists in a person, so that the intention arises to report the fraudulent act.

Professional identity affects the whistleblowing intention of the financial staff of the Badung Regency Government Center. This shows that they have a high professional attitude towards their profession, which creates a sense of wanting to protect the profession and their workplace.

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## Some Properties of Fractional Vector Analysis



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**ABSTRACT:** We are motivated to work on this topic by some research papers dealing with fractional derivatives. Using the notion of Conformable Fractional Derivative provided in R. Khalil, M. Al Horani, A. Yousef, and M. Sababheh [5], we prove certain relevant features of Fractional Gradient, Divergence, and Curl in this study.

**KEYWORDS:** Conformable Fractional Derivative; Fractional Calculus; Fractional Differential Equations; Fractional gradient, divergence, curl.

**Mathematics Subject Classification (2010):** 26A33, 26A24.

### 1. INTRODUCTION

Non-integer order derivatives and integrals are studied and applied in fractional calculus, a new discipline of mathematics. It has more than a 320-years history. Its progress has primarily been centred on the pure mathematical discipline. Liouville, Riemann, Leibniz, and others appear to have conducted the first systematic research in the 19th century. Fractional differential equations (FDEs) have been utilized to explain a variety of stable physical phenomena with anomalous degradation throughout the last two decades. Many mathematical models of real-world problems that arise in engineering and research are either linear or non-linear systems. With the discovery of fractional calculus, it has been shown that differential systems may be used to describe the role of many systems. It's worth noting that the fractional calculus may be used to describe a variety of physical processes with memory and genetic features. In reality, fractional order systems make up the majority of realworld processes.

Fractional Calculus is as old as Calculus. L' Hospital wrote to Leibniz on September 30th, 1695, inquiring about a particular notation he had used in his writings for the  $m$ th-derivative of the linear function  $f(x) = x, \frac{d^m x}{dx^m}$ .

L'Hopital's raised the question to Leibniz, what will happen if  $m = \frac{1}{2}$  ? Leibniz's response: "An apparent paradox, from which one day useful consequences will be drawn". As a result, fractional calculus was born on that date, and it is now known as fractional calculus' birthday. Many academics have attempted to define fractional derivative since then. The Riemann-Liouville and Caputo definitions are the most important. We recommend the reader to [1-4] for the history and important results on fractional derivatives.

**Definition 1.1 "Riemann-Liouville Definition":** For  $\beta \in [m - 1, m)$ ,  $\beta$ -derivative of function  $g(u)$  is

$$D_a^\beta(g)(u) = \frac{1}{\Gamma(m - \beta)} \frac{d^m}{dt^m} \int_a^u \frac{g(x)}{(u - x)^{\beta - m + 1}} dx.$$

**Definition 1.2 "Caputo Definition":** For  $\beta \in [m - 1, m)$ ,  $\beta$ -derivative of function  $g(u)$  is

$$D_a^\beta(g)(u) = \frac{1}{\Gamma(m - \beta)} \int_a^u \frac{g^m(x)}{(u - x)^{\beta - m + 1}} dx.$$

All of the definitions thus far, including 1.1 and 1.2, satisfy the property that the fractional derivative is linear. By all definitions, this is the single property inherited from the first derivative. However, such definitions have some drawbacks:

- i. The R-L derivative does not satisfy  $D_a(1) = 0$  ( $D_a^\beta(1) = 0$  for "Caputo definition") if  $\beta \notin \mathbb{N}$ .
- ii. All fractional derivatives do not satisfy the known formulas of the derivative of the product and quotient of two functions:



## Some Properties of Fractional Vector Analysis

$$D_a^\beta(hg) = hD_a^\beta(g) + gD_a^\beta(h).$$

$$D_a^\beta\left(\frac{h}{g}\right) = \frac{gD_a^\beta(h) - hD_a^\beta(g)}{g^2} \quad \beta$$

iii. All fractional derivatives do not satisfy the Chain Rule:

$$D_a^\beta(hog)(t) = h^{(\beta)}(g(t))g^{(\beta)}(t).$$

iv. All fractional derivatives do not satisfy  $D_a^\alpha D_a^\beta(g) = D_a^{\alpha+\beta}(g)$  in general.

## 2. NOTATIONS AND PRELIMINARIES

The conformable fractional derivative, defined by the authors in [5] is a well-behaved simple fractional derivative that is based solely on the derivative's basic limit definition.

Khalil et. al. [5] have introduced a new derivative called "the conformable fractional derivative" of function

'g' of order ' $\beta$ ' and is defined by

$$T_\beta(g(u)) = \lim_{\epsilon \rightarrow 0} \frac{g(u+\epsilon u^{1-\beta}) - g(u)}{\epsilon},$$

where  $g: [0, \infty) \rightarrow \mathbb{R}$  and  $0 < \beta \leq 1$ , and the fractional derivative at 0 is defined as

$$g^{(\beta)}(0) = \lim_{t \rightarrow 0^+} T_\beta(g(u)).$$

This new definition satisfies:

1.  $T_\beta(af + bg) = aT_\beta(f) + bT_\beta(g)$  for all real a, b.

2.  $T_\beta(c) = 0$  for all constant functions  $f(t) = c$ .

Further, for  $0 < \beta \leq 1$ , and f, g be  $\beta$ -differentiable at apoint t, with  $(t) \neq 0$ , we have

3.  $T_\beta(fg) = fT_\beta(g) + gT_\beta(f)$ .

$$T_\beta\left(\frac{f}{g}\right) = \frac{gT_\beta(f) - fT_\beta(g)}{g^2}.$$

- 4.

Fractional derivatives of certain functions are given by:

1.  $T_\beta(t^p) = pt^{p-\beta}$ .

$$T_\beta\left(\sin \frac{1}{\beta} t^\beta\right) = \cos \frac{1}{\beta} t^\beta.$$

$$T_\beta\left(\cos \frac{1}{\beta} t^\beta\right) = -\sin \frac{1}{\beta} t^\beta$$

$$T_\beta\left(e^{\frac{1}{\beta} t^\beta}\right) = e^{\frac{1}{\beta} t^\beta}.$$

- 2.

- 3..

- 4.

On letting  $\beta = 1$  in these derivatives, we get the corresponding ordinary derivatives.

## 3. MAIN DEFINITIONS

The fractional gradient, divergence, and curl described by M. Mhailan, M. Abu Hammad, M. Al Horani, and R. Khalil [6] are defined in this section.

In this paper we use the notation  $D_x^\beta u$  to denote the conformable  $\beta$ - derivative of u with respect to the variable x, where u is function of several variables with domain  $\{(x, y, z): x, y, z > 0\}$ . SV will be used to represent such a space of functions. VF stands for the space of vector field  $F: R^3 \rightarrow R^3$ , with domain  $\{(x, y, z): x, y, z > 0\}$ .

**Definition 3.1[6]:** For  $f \in SV$ , Fractional Gradient is defined as  $\nabla^\beta f = D_x^\beta f i + D_y^\beta f j + D_z^\beta f k$

where  $\nabla^\beta = iD_x^\beta + jD_y^\beta + kD_z^\beta$ .

**Definition 3.2[6]:** For  $F = Pi + Qj + Rk \in VF$ , Fractional Divergence is defined as

$$\nabla^\beta \cdot F = D_x^\beta P + D_y^\beta Q + D_z^\beta R.$$

**Definition 3.3[6]:** For  $F = Pi + Qj + Rk \in VF$ , Fractional Curl is defined as

$$\nabla^\beta \times F = (D_y^\beta R - D_z^\beta Q)i + (D_x^\beta R - D_z^\beta P)j + (D_x^\beta Q - D_y^\beta P)k.$$

## Some Properties of Fractional Vector Analysis

### 4. MAIN RESULTS

In this section, we prove some useful properties of Fractional Gradient, Divergence and Curl using the definition of Conformable Fractional Derivative.

#### Theorem 4.1(Properties of Fractional Gradient):

- i.  $\nabla^\beta$  is linear. ii.  $\nabla^\beta f = 0$  if  $f$  is constant. iii.  
 $\nabla(fg) = f \nabla^\beta g + g \nabla^\beta f$ . iv.  
 $\nabla^\beta \left(\frac{f}{g}\right) = \frac{g \nabla^\beta f - f \nabla^\beta g}{g^2}$ .  
v. If  $\vec{r}(\beta) = \frac{x^\beta}{\beta} i + \frac{y^\beta}{\beta} j + \frac{z^\beta}{\beta} k$ , then  $\nabla^\beta r(\beta) = \beta \frac{\vec{r}(\beta)}{r(\beta)}$ .  
vi.  $\nabla^\beta r(\beta) = \beta^2 n r^{n-2} r^\rightarrow(\beta)$ .

**Proof:** The definition itself directly leads to parts (i) and (ii). Since they are essential, we pick to demonstrate (iii)-(vi).

$$\begin{aligned} \text{(iii)} \nabla^\beta(fg) &= (iD_x^\beta + jD_y^\beta + kD_z^\beta)fg \\ &= (iD_x^\beta fg + jD_y^\beta fg + kD_z^\beta fg) \\ &= i(fD_x^\beta g + gD_x^\beta f) + j(fD_y^\beta g + gD_y^\beta f) + k(fD_z^\beta g + gD_z^\beta f) \\ &= f(iD_x^\beta g + jD_y^\beta g + kD_z^\beta g) + g(iD_x^\beta f + jD_y^\beta f + kD_z^\beta f) \\ &= f \nabla^\beta g + g \nabla^\beta f. \end{aligned}$$

$$\begin{aligned} \text{(iv)} \nabla^\beta \left(\frac{f}{g}\right) &= (iD_x^\beta + jD_y^\beta + kD_z^\beta) \left(\frac{f}{g}\right) \\ &= \left(iD_x^\beta \frac{f}{g} + jD_y^\beta \frac{f}{g} + kD_z^\beta \frac{f}{g}\right) \\ &= i \left(\frac{g D_x^\beta f - f D_x^\beta g}{g^2}\right) + j \left(\frac{g D_y^\beta f - f D_y^\beta g}{g^2}\right) + k \left(\frac{g D_z^\beta f - f D_z^\beta g}{g^2}\right) \\ &= \frac{g(D_x^\beta f i + D_y^\beta f j + D_z^\beta f k) - f(D_x^\beta g i + D_y^\beta g j + D_z^\beta g k)}{g^2} \\ &= \frac{g}{g^2} \nabla^\beta f - \frac{f}{g^2} \nabla^\beta g \end{aligned}$$

$$\begin{aligned} \text{(v)} \text{ If } \vec{r}(\beta) = \frac{x^\beta}{\beta} i + \frac{y^\beta}{\beta} j + \frac{z^\beta}{\beta} k, \text{ then } \nabla^\beta r(\beta) &= (iD_x^\beta + jD_y^\beta + kD_z^\beta) \frac{r(\beta)}{\beta} \\ &= \frac{1}{\beta} (iD_x^\beta + jD_y^\beta + kD_z^\beta) r(\beta) \\ &= \frac{1}{\beta} \left( i \frac{\beta}{r(\beta)} x^\beta + j \frac{\beta}{r(\beta)} y^\beta + k \frac{\beta}{r(\beta)} z^\beta \right) \\ &= \frac{1}{\beta} \left( i \frac{\beta}{r(\beta)} x^\beta + j \frac{\beta}{r(\beta)} y^\beta + k \frac{\beta}{r(\beta)} z^\beta \right) \\ &= \beta \frac{\vec{r}(\beta)}{r(\beta)} \end{aligned}$$

provided partial derivatives are performed using the definition of Conformable Fractional Derivative.

If  $\beta = 1$ , then we get  $grad(r) = \frac{\vec{r}}{r}$ .

$$\begin{aligned} \text{(vi)} \nabla^\beta r^n(\beta) &= iD_x^\beta r^n(\beta) + jD_y^\beta r^n(\beta) + kD_z^\beta r^n(\beta) \\ &= i \left[ x^{1-\beta} n r^{n-1} \frac{\partial r}{\partial x} \right] + j \left[ y^{1-\beta} n r^{n-1} \frac{\partial r}{\partial y} \right] + k \left[ z^{1-\beta} n r^{n-1} \frac{\partial r}{\partial z} \right] \\ &= [\beta x^\beta n r^{n-2}] + j[\beta y^\beta n r^{n-2}] + k[\beta z^\beta n r^{n-2}] \\ &= \beta^2 n r^{n-2} r^\rightarrow(\beta). \end{aligned}$$

If  $\beta = 1$ , then we get  $grad r^n = n r^{n-2} r^\rightarrow$ .

#### Theorem 4.2(Properties of Fractional Divergence):

- i. Fractional Divergence is linear. ii.  $\nabla^\beta \cdot \mathbf{F} = 0$  if  $\mathbf{F}$  is constant. iii.  $\nabla^\beta \cdot (f\mathbf{F}) = \mathbf{F} \cdot \nabla^\beta f + f \nabla^\beta \cdot \mathbf{F}$  where  $f \in SV$  and  $\mathbf{F} \in VF$ .

**Proof:** The definition itself directly leads to parts (i) and (ii). Since this is essential, we decide to demonstrate (iii).

$$\begin{aligned} \text{(iii)} \text{ For } F = Pi + Qj + Rk \in VF, \nabla^\beta \cdot (f\mathbf{F}) &= (iD_x^\beta + jD_y^\beta + kD_z^\beta) \cdot (f\mathbf{F}) \\ &= (iD_x^\beta + jD_y^\beta + kD_z^\beta) \cdot (f\mathbf{F}) \\ &= \left( i \cdot D_x^\beta (f\mathbf{F}) + j \cdot D_y^\beta (f\mathbf{F}) + k \cdot D_z^\beta (f\mathbf{F}) \right) \\ &= \sum i \cdot D_x^\beta (f\mathbf{F}) \end{aligned}$$

## Some Properties of Fractional Vector Analysis

$$\begin{aligned}
 &= \sum i. (fD_x^\beta F + D_x^\beta fF) \\
 &= f \sum (i. D_x^\beta F) + \sum (iD_x^\beta f). F \\
 &= F. \nabla^\beta f + f \nabla^\beta. F
 \end{aligned}$$

### Theorem 4.3(Properties of Fractional Curl):

- i. Fractional Curl is linear.  
 ii.  $\nabla^\beta \times F = 0$  if  $F$  is constant. iii.  $\nabla^\beta \times (fF) = \nabla^\beta f \times F + f \nabla^\beta \times F$  where  $f \in SV$  and  $F \in VF$ . iv.  $\nabla^\beta. (F \times G) = G. (\nabla^\beta \times F) - F. (\nabla^\beta \times G)$ .

Proof: The definition itself directly leads to parts (i) and (ii). Since they are essential, we pick to demonstrate (iii) and (iv).

$$\begin{aligned}
 \text{(iii) } \nabla^\beta \times (fF) &= (iD_x^\beta + jD_y^\beta + kD_z^\beta) \times (fF) \\
 &= \sum i \times D_x^\beta (fF) \\
 &= \sum i \times (D_x^\beta fF + fD_x^\beta F) \\
 &= \sum (i \times D_x^\beta fF) + f \sum (i \times D_x^\beta F) \\
 &= \sum D_x^\beta f (i \times F) + f \sum (i \times D_x^\beta F) = \nabla^\beta f \times F
 \end{aligned}$$

+  $f \nabla^\beta \times F$

$$\begin{aligned}
 \text{(iv) } \nabla^\beta. (F \times G) &= \sum i. D_x^\beta (F \times G) \\
 &= \sum i. (D_x^\beta F \times G + F \times D_x^\beta G) \\
 &= \sum i. (D_x^\beta F \times G) + \sum i. (F \times D_x^\beta G) \\
 &= \sum i. (D_x^\beta F \times G) - \sum i. (D_x^\beta G \times F) \\
 &= \sum (i \times D_x^\beta F). G - \sum (i \times D_x^\beta G). F \\
 &= (\nabla^\beta \times F). G - (\nabla^\beta \times G). F = G. (\nabla^\beta \times F) - F. (\nabla^\beta \times G)
 \end{aligned}$$

**Declarations:**

**Funding:** No funding is available.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Availability of Data and Material:** Data sharing is not applicable to this article as no data sets were generated and analysed during the current study.

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## The Effect of Visualization Exercise through Video Media on Increasing Basketball Free Throw Shooting



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**ABSTRACT:** This study aims to determine the effect of visualization exercises through video media on the increase in basketball free-throw shooting. This type of research is a pseudo-experimental study with the design of "The One Group Pretest Posttest Design". The population in this study was a 24-person male basketball extracurricular participant who was taken with a total sampling technique. The instrument used is a free throw shot test. The analysis of the data used a 5% significance test. Research results show a significant effect of visualization exercise over video media on the increase in basketball free throw shooting, with a count value of  $9.859 \pm t$  table of 2.069, and a significance value of  $0.000 \pm 0.05$ .

**KEYWORDS:** visualisation, video media, shooting a free throw

### INTRODUCTION

Basketball is a group ball sport consisting of two teams of five people, each competing to score points by putting the ball into the opponent's basket (Candra, 2020); (Ilham et al., 2020); (Christanto et al., 2019). Basketball provides many physical, mental, and social benefits. Skills such as shooting, passing, dribbling, rebounding, and teamwork to attack or defend are prerequisites for success in playing this sports (Lubay, 2019). In general, there are several basic techniques in basketball, namely a) basic passing techniques, b) basic techniques for receiving the ball, c) basic dribbling techniques, d) basic shooting techniques, e) basic footwork techniques, f) pivot training techniques (Abady & Syaleh, 2020); (Hussen et al., 2020).

The game in basketball often causes violations (violations) and mistakes (fouls). In a basketball game, with ten players moving quickly over a limited distance, contact is unavoidable, resulting in a foul. A free throw is a gift given by the referee to a player for scoring one point in a position just behind the free throw line, the distribution of free throws is usually given if the opposing player commits a violation in a prohibited area (Goldschmied et al., 2021); (Bühren & Kadriu, 2020). The victory of a team is sometimes determined by the success in making free throws or free throws, the better the free throws, the more points or the team's score, with a high score. Will be declared the winner.

The facts on the field before shooting the free throw did not bend the knee maximally (90 degrees), thus causing the released ball not to be able to form the correct parabolic angle, which in the end, the ball did not enter the basketball hoop, because when shooting the parabolic angle was expected to be around 30 degrees from the vertical direction or 60 degrees from the horizontal direction. Free throw shooting practice is determined by how many minutes to rest, if a 5-minute break means that the overall athlete shoots free throws for 5 minutes, and this will continue to be done to fill the training rest session. Another observation of the author shows that in the training session, there is no particular program for shooting free throws, so shooting free throws is considered a free throw shooting exercise to determine who has the right to drink or rest first, for example, who can enter the ball during free throw shooting may drinking. In contrast, those who do not enter the ball while shooting free throws are penalized for doing push-ups or running around the field.

In the shooting movement, there is the term balance, eyes, follow through (BEEF), where in shooting, the body must be balanced with a focused view on the ring, then the elbows form a 90-degree angle and end with a follow-up movement (Koh & Wang, 2020). Shooting is a basketball game technique that is quite complex to other techniques, which means that the shooting technique consists of several elements of motion coordinated into a series to produce good shooting movements.

Shooting training methods have not been performed to the maximum extent, so the free throw shooting results have not shown good results. Although there are quite a few methods of shooting training that can be used, one of them is mental training in the form of visualization using video media. The terms describing mental training for athletes in games include visualization, mental

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rehearsal, imaging, meditation, and mental practice (Hut et al., 2021); (Snelgrove & Gabbott, 2020). These terms are in principle the same, "to create or recreate an experience in mind".

Imagery in sports can also be referred to as visualization or mental exercise. Imagery is imagining a particular movement or situation that has either been performed or has never been performed by involving all senses. Imagery means using all senses (Seeing, feeling, hearing, feeling, kissing) to train the sport played on the athlete's mind (Dave & Nandhinee, 2019); (Munroe-Chandler & Guerrero, 2018).

Visualization exercises are performed using a free throw technique video medium played through a laptop. By utilizing audiovisual media, it is expected to understand and perform free throw shooting movements correctly according to what is seen in the audio-visual medium through images and sounds. In an audio medium, the visual medium can both listen and watch the actual technique and form of free throw shooting.

### Visualization Exercise Steps

The steps for doing visualization exercises, first of all, is done with relaxation. In visualization exercises, there will be a dialogue between the brain and the athlete's body during the exercise. The implementation of visualization exercises in general is first carried out with an opening in which there are (prayers, preparations, and explanations about the exercises to be carried out). The following is the order in which the basketball free-throw shooting visualization exercise is implemented:

**Table 1. Visualization Exercise Program Implementation Guide**

No	Description	Information
1.	Visualization exercise is a mental training method using video assistance to assist athletes in visualizing related to understanding and inculcating a correct basketball free throw shooting technique.	
2.	Visualization exercises are performed at the beginning of each training session. The training sessions were held face-to-face 16 times. Each training session is held for 60 minutes. With details of a 10-minute visualization session, 10-minute warm-up, 20-minute actualization session, 10-minute game, and 10-minute cool down.	Exercise Frequency: 16 times face-to-face (1 week 4 times)
2.	One coach accompanies each group.	
3.	The coach directs the athlete to place himself in a conducive corner of the training area.	Exercise is done in a quiet place.
4.	The coach instructs the athletes to do static stretching.	Athletes do light stretching to relieve muscle tension.
5.	The coach conditions the athletes to position themselves as relaxed as possible in a sitting position.	The best position for visualization practice is sitting.
6.	The coach carries out visualization exercises by giving videos related to basketball free-throw shooting techniques	Visualization exercise volume: 10-minutes
7.	When the athlete watches and pays attention to the video, the coach gives instructions and suggestions to the athlete regarding keywords from a series of basketball free throw shooting techniques.	Trainers in giving instructions using keywords (triggers).
8.	At the stage, after paying attention to the video and visualization related to shooting basketball free throws, the coach instructs the athletes to visualize a series of basketball free-throw shooting movements briefly and then shoot real basketball free throws.	Free throw shooting Set: 4 Reps: 10 Duration 20 minutes
9.	At the end of the training, the coach evaluates the course of the training session.	

Stimulation through video playback like this is done repeatedly during the 10-minute visualization training. After 10 minutes of doing visualization exercises, the coach instructs the athletes to do a real free throw basketball shooting practice, with the implementation of the exercise, Sets 4, Reps: 10.

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**Table 2. Visualization Exercise Program Implementation Guide**

No	Practice Guide Order	Information	Duration
1.	Coaches and athletes carry out prayer activities according to their respective beliefs before carrying out the next activity.	(Opening)	10-minute
2.	Coaches and athletes position themselves.	(core exercise)	6-minute
3.	The coach instructs the athlete to position the body as relaxed as possible.		
4.	The coach showed a video related to the basketball free-throw shooting technique series.		
5.	When the athlete focuses on watching the video, the coach gives instructions regarding the correct series of basketball free-throw shooting techniques. In addition, the coach gives keywords for each series of basketball free throw shooting movements		
6.	When the athlete watches the video, the coach also directs the athlete to visualize the correct series of basketball free-throw shooting movements.		
7.	The coach's role is to direct the athlete to have a picture of the correct basketball free-throw shooting sequence.		
8.	The coach gives instructions with keywords regarding the correct sequence of shooting free throw basketballs.		
9.	Athletes doing static and dynamic warm-up	10-minute	
10.	The last stage of training is for each athlete to visualize the basketball free throw shooting technique	Sets: 4 Reps: 10 20 minutes duration	
10.	Athletes cool down in pairs, followed by evaluation and closing.	(Closing) 10 minutes	

### METHODS

This type of research is quasi-experimental research. The experimental method is defined as a systematic method for building relationships that contain causal-effect connections. The design used in this study was "The One Group Pretest Posttest Design," or the absence of a control group. The population in this study were male basketball extracurricular participants, totaling 24 people. Sampling in this study was carried out by total sampling. All 24 male basketball extracurricular participants were taken as samples. The instrument to be used is a penalty shot test / free throw, as many as ten throws then added up. The scoring criteria are: a score of 0 is given if the shot does not enter, a value of 1 if the direction of the shot is straight against the ring and the ball touches the ring (the ball does not enter), and a value of 2 if the ball enters. The implementation of this test is that athletes are collected and given an explanation, athletes warm up for 15 minutes, athletes who will take the penalty shot test are called one by one, and the ball is given to athletes after athletes are ready and behind the penalty shot line. Each athlete has a chance to make ten penalty shots and then add up the scores.

### FINDING

The complete statistical description of the pretest and posttest shooting free throw basketball is presented in table 3 as follows:

**Table 3. Basketball Shooting Freethrow Pretest and Posttest Results**

Statistik	Pretest	Posttest
N	24	24
Mean	8.17	12.29
Median	8.00	12.00
Mode	8.00	10.00a
Std. Deviation	1.61	2.31
Minimum	5.00	9.00
Maximum	12.00	17.00

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**Table 4. Normality Test Result**

Group		p	Sig.	Description
Shooting Free-throw	Pretest	0,448	0,05	Normal
	Posttest	0,156	0,05	Normal

From the results of table 4 above, it can be seen that the free throw shooting pre-test and post-test data have a p-value (sig.) > 0.05. then the variable is normally distributed.

**Table 5. Homogenitas Test Result**

Variable	Levene Statistic	df1	df2	Sig.
Pretest dan posttest shooting free-throw	4,344	1	46	0,243

From table 5 above, it can be seen that the value of sig. Pretest and posttest shooting free throw 0.243 > 0.05, so the data is homogeneous.

**Table 6. T-Test Results in Pretest and Posttest Shooting Free-throw Basketball**

Group	Average	t-count	t-table	signifikansi	Percentage
Pretest	8,17	9,859	2,069	0,000	25,09%
Posttest	12,29				

From the results of the t-test, it can be seen that the t-count is 9.859 and the t-table (df 23) is 2.069 with a p significance value of 0.000. Because t arithmetic 9.859 > t table 2.069, and a significance value of 0.000 < 0.05, these results indicate a significant difference. Thus the alternative hypothesis (Ha), which reads, "There is a significant effect of visualization exercise through video media on increasing basketball free throw shooting," is accepted. Free throw shooting pretest data has an average of 8.17 and at the time of posttest increased by 12.29, while the percentage increase was 25.09%.

### DISCUSSION

Based on the results of the analysis, showed that there was a significant effect of visualization exercise through video media on increasing basketball free throw shooting. The use of audio-visual media can stimulate athletes to be more focused and focused. This is because audio-visual media can improve the athlete's ability to understand an abstract concept more easily so that the athlete remembers the lessons that have been delivered better. By using audio-visual media in the practice process, providing information to students is more varied because audio-visual media already contains text, audio, graphics, and video.

Field's research (Khan et al., 2018) findings showed that the participants in the PETTLEP imagery interventions showed better accuracy in netball shooting compared to the participants in the traditional intervention group. However, both audio and combination of audio and video PETTLEP interventions enhanced similar netball shooting performances. In conclusion, from this study, the PETTLEP imagery model was found to improve players' performance, especially when combined with audio imagery and video modeling. Research (Satriawan & Amar, 2020) imagery training significantly improves lay-up shots' results for students taking basketball extracurricular activities at SMA N 1 Woha. In a study (Novriansyah et al., 2019), the results show a significant difference between internal and external imagery training on the results of free-throw extracurricular basketball balls, which is evident from the value sig = 0.010.

Imagery training is a form of mental exercise in the form of self-image and movement in the mind (Yadolahzadeh, 2020); (Pop & Tiba, 2019). The benefits of imagery exercises, among others, are to learn or repeat new movements, correct a wrong or imperfect movement, simulation exercises in mind, and training for athletes undergoing injury rehabilitation. Imagery exercises are often equated with visualization exercises because they visualize the movement in mind. However, the athlete's image not only "sees" his movement but also functions the senses of hearing, touch, smell, and taste. To be able to master imagery exercises, an athlete must first be proficient in doing relaxation exercises.

By doing imagery or visualization exercises, an athlete will be able to change his perception of something. All the experiences and exercises that have been carried out are imagined in every detail and the movements to the possible strategies used in the match. Through the process of imagery or visualization exercises that are carried out regularly, an athlete can form an image (something imagined in mind) of a situation in various perceptual frames persepsi (Bedir & Erhan, 2021); (Ivanova, 2019).



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Athletes (and coaches in training) can use this form of mental training to learn or repeat new movements and correct incorrect or incomplete movements. Simply put, an athlete can simulate technical training in his mind, besides that, it can also be used as a training tool for athletes recovering from injury.

Mental imagery exercises carried out in this study are a series of activities to imagine and bring back the activities carried out in mind in the form of events or experiences of accurate motion stored in memory. Repeating continuously by imagining activities or movements that are in a relaxed state can make a person more focused in carrying out their activities and program one's mind. The words spoken repeatedly will become a program of thoughts in your mind. Therefore, the significant effect of this mental imagery exercise can be seen in this study. Imagery is one of the most important techniques in the cognitive regulation of an athlete, whether it is used to understand how a skill should be performed, practice different possible competitive situations, or what experience would be like to achieve one dream goal. It can be concluded that imagery can have an impact on self-confidence and then have an effect on the appearance of athletes, or imagery can have a direct impact on both appearance and self-confidence.

### CONCLUSION

Based on the results of data analysis, description, testing of research results, and discussion, it can be concluded that there is a significant effect of visualization exercises through video media on increasing basketball free throw shooting at SMA Negeri 3 Klaten, with a  $t$  value of  $9.859 > t$  table  $2.069$ , and a significance value of  $0.000 < 0.05$ .

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## Labyrinthine Geriatric Informal Caregiving amidst COVID-19 Pandemic

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**ABSTRACT:** The situation of geriatric caregiving may seem easy in the eyes of many if the carers are regularly compensated. The purpose of this study was to explore the lived experiences of geriatric informal caregivers through the phenomenological approach to qualitative research. Typically, tasks in the household, at school or in the workplace are complicated by the simultaneous participation and involvement as a student or as a government employee. Thematic analysis of the transcripts showed that investing on priorities determine which tasks have to be accomplished first, and which comes next. All of the participants described the support extended by their family members, classmates/workmates, and the community people as both material and non-material which include emotional and moral support in the form of prayers, sympathy, and words of inspiration and motivation. Material support is through food, goods, medicine, and money. These efforts are vital contributions to them by providing constant assurance of support on finances, spiritual guidance, positive emotional upliftment, and errands-made-easier assistance.

**KEYWORDS-**geriatric, informal, caregiving, complicated, care culture, support

### I. INTRODUCTION (SIZE 10 & BOLD)

As the older Filipinos rise in the coming years, families and societies, including the government, will have to face the challenges of delivering care to this population. Behind satisfied care recipients are the laudable services provided by family members who became older adults' informal caregivers, lovingly dedicating their time and space and unconditional labor as they humbly devote payback moments to persons who cared for them first during their dependent years.

The tradition of caring for the older adults still lingers in Filipino families. They enjoy a significant amount of care and unending support from their children and spouse, as long as he or she is still alive. Family support comes in many forms like financial support, companionship and assistance. As stated in Article XV (Family) Section 4 of the Philippine Constitution, "The family has the duty to care for its elderly members but the State may also do so through programs of social security."

Under Republic Act (RA) 9994 or the Expanded Senior Citizens Act of 2010, it states that (d) To encourage their families and the communities they live with to reaffirm the valued Filipino Tradition of caring for the senior citizens; (e) To provide a comprehensive health care and rehabilitation system for disabled senior citizens to foster their capacity to attain a more meaningful and productive ageing.

Be it for the older adults or the informal caregivers themselves, the 2030 Agenda for Sustainable Development recognizes the importance of good health to long-term development and the interdependence of the two. The third goal is aimed at good health and well-being, which means promotion of healthy lives and over-all well-being at all ages, is essentially ensured.

The World Health Organization (WHO) has been at the forefront of the international fight to combat COVID-19; along with partners they produced Strategic Preparedness and Response Plan. They laid out public health steps that countries, including the Philippines, prepared for and responded to, in order to provide guidelines and assistance for people to look after their mental health, particularly health workers, administrators of health facilities, persons caring for children, older adults, people in isolation, and members of the general public.

When governments are shifting away from formal care and toward informal care in order to meet rising care demands and healthcare expenses due to budget cut, older individuals were urged to remain at home rather than entering nursing facilities. To make it work, such people will have to rely on their immediate network of family and friends for informal care.

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Claiming truth to it, results from the Philippines COVID-19 Households Survey (2020)<sup>[1]</sup> obtained a response that majority of Filipinos needed medical treatment but one in three households was not able to obtain it due to lack of money, fear of contracting the virus, and constraints in health care facilities.

Realizing how overwhelming the tasks are during the COVID-19 pandemic, the informal caregivers strive to achieve work and life balance in order to carry on with life in the finest way possible.

Geriatric informal caregivers make a big contribution. A huge bulk of task is laid down to them. The lack of hospital facilities and the space required to care for elderly patients from the hospital or discharged patients and are, thus, endorsed to the hands of the informal caregivers who assist with day-to-day tasks, manage treatment-related illnesses, educating, encouraging, and empowering people to care for them. Aside from that, informal caregivers should display an amount of information about the illness taken care of, remarkable house-keeping skills, coping behaviors, financial experiences, and sufficient formal care mentoring from the more experienced family member.

While the limelight is focused much on the elderly, the informal caregivers deserve much special and important credit as well. Carrying the bulk of responsibilities at home, school, and workplace may have its own share of intricacies amidst the pandemic. Wherever they get the courage and strength to get through each day must be from very reliable support systems that contribute in one way or another to the experiences and lessons which are worth emulating. There must be manifestations of work and life balance that has emanated from the support the informal caregivers acquire from the significant people in their lives. With their vital contributions, there may be more defined culture of care in the Philippines that has to be discovered.

### **II. THE PROBLEM**

The study is aimed at exploring the lived experiences of the geriatric informal caregivers.

Specific questions guide this study:

1. How complicated are the tasks of the informal geriatric caregivers amidst COVID-19 pandemic?
2. How is support extended by the family members, schoolmates or workmates, and the community people to the informal caregivers during the time of COVID-19 pandemic?
3. How vital are the contributions of the following entities in the informal geriatric caregivers:
  - a. family members,
  - b. schoolmates or workmates, and
  - c. the community people?

### **III. SIGNIFICANCE OF THE STUDY**

This study is a significant endeavor in promoting the over-all well-being of informal caregivers to disseminate information in the Philippine setting not only during the COVID-19 pandemic but during the duration of caregiving.

### **IV. RELATED LITERATURE AND STUDIES**

Informal caregivers are individuals voluntarily caring for a relative or a friend facing illness, disability, or any condition requiring particular attention<sup>[2]</sup>. World Health Organization (WHO)<sup>[3]</sup> expounded that home care may be considered for an adult or child with confirmed or suspected COVID-19 when inpatient care is unavailable or unsafe (e.g. when capacity is insufficient to meet the demand for health-care services). Such patients who have been discharged from hospital may also be cared for at home, if necessary.

Family members or other informal caregivers, either instead of or in addition to professional caregivers attend to the person with a patient's needs. Informal caregiving consists of the ongoing activities and experiences involved in offering unpaid help to relatives or friends who are unable to take care of themselves<sup>[4]</sup>.

Ammar, et al<sup>[5]</sup> on their multicenter online survey regarding psychosocial consequences due to the COVID-19 restrictions (ECLB-COVID19) confirmed earlier findings from before the pandemic, that informal caregivers have a higher burden regarding mental and physical health. The results also point out that their wellbeing and depression significantly worsened during lockdown compared to non-caregivers<sup>[6]</sup>. While the numbers of COVID-19 infections during the first wave in spring 2020 in Germany was modest, substantial COVID-19 measures were applied. Throughout those measures, i.e., contact restrictions, informal caregiving still took place<sup>[7]</sup>. Despite some evidence that psychosocial burden significantly increased for informal caregivers during the pandemic, there is limited evidence on how much that psychosocial burden depends on the involvement and support the informal caregivers received during lockdown. Furthermore, there are no findings on how certain COVID-19-related stressors (i.e., implementation of COVID-19-measures) affect the psychosocial burden of informal caregivers.

## **Labyrinthine Geriatric Informal Caregiving amidst COVID-19 Pandemic**

Due to the unprecedented and novel nature and scope of COVID-19, there is limited research on the effects of the pandemic to informal caregivers. However, informal caregivers may be especially vulnerable to effects of COVID-19 with respect to changes in caregiving responsibilities (caregiving intensity) and impacts on physical and mental health and health-related quality of life due to the pandemic<sup>[8]</sup>.

### **V. RESEARCH METHODOLOGY**

This study was designed to be qualitative. This study focused on phenomenological inquiry where the researcher asked what the informal caregivers' experiences are in regard to some phenomenon, and how they interpret those experiences. In phenomenological research design, the researcher used a combination of methods such as conducting interviews, reading documents, watching videos or visiting places or events, if the health and safety situation will stabilize, to understand the meaning subjects place on whatever is being examined.

The ten subjects chosen from the six districts of the municipality of Bayambang qualified to the following criteria: a college student or a regular government employee informal caregiver who lives with family member/s who suffered from any variant of the COVID-19, must be in the same compound or house with the older adult aged 60 years or older, and is willing to become part of the study.

The researcher utilized pseudonyms for each of the subject to keep their privacy. The statements gathered were recorded in an audio recorder file. Inductive coding based on the data itself was utilized; where codes emerged from the data. There were no predetermined set of codes, and that these were developed as data were reviewed. With inductive coding, it just went with the flow of data.

### **VI. FINDINGS AND DISCUSSIONS**

This phenomenological study presents the lived experiences of informal caregivers involved in complicated tasks during the COVID-19 pandemic. Phenomenology provides an opportune time for individuals to share their experiences in life in order to illuminate the previously misunderstood and unknown. Assortments of experiences are provided to give readers a deeper understanding of the research participants.

This chapter presents the key findings obtained from in-depth interviews beginning with a brief description of the interviewees. The results of the study inform understanding of the labyrinthine informal caregiving to geriatric family members by manifesting that (a) setting priorities dominates; (b) work and life balance is essential; and (c) care culture only in the Philippines. These themes are based on studying the overarching research question below:

1. How complicated are the tasks of the informal geriatric caregivers amidst COVID-19 pandemic?
2. How is support extended by the family members, schoolmates or workmates, and the community people to the informal caregivers during the time of COVID-19 pandemic?
3. How vital are the contributions of the following entities in the informal geriatric caregivers:
  - a. family members,
  - b. schoolmates or workmates, and
  - c. the community people?

#### **Setting Priorities Dominates**

Informal caregivers experienced complicated tasks throughout their caring years while they are college students or government employees. The most complicated tasks are those that interfere with the students' accomplishment of learning activities and synchronous class sessions, and employees' duties and responsibilities in their respective workplaces.

Yes. Caregiving got complicated when there are many homework and quizzes, and I have to look for spot near the house with faster internet connection from my phone's data during online classes. I have to close my device's video camera when I have to attend to the needs. (Jasmin, Marga, Conrad, Jonas, Anita)

Yes. The more it became complicated during COVID-19 pandemic due to the community lockdown, the home or facility isolation or quarantine, market schedules, disinfection drives, travel restrictions, triage situations in hospital, skeleton workforce in the workplaces and the tasks at home as a mother, wife, an informal caregiver to mother/grandmother. There was a huge adjustment to mobility, finances, and emotional battles. (Johanna, Olga, Tracy, Madonna, Susan)

Informal caregiving has become complicated during the COVID-19 pandemic due to major adjustments in the health and safety situations around community.

The data suggests that most of the students with caregiving responsibility know which tasks need priority like household chores that includes cooking, cleaning around the house, doing laundry, feeding the elderly their regular meals and medicine.

## **Labyrinthine Geriatric Informal Caregiving amidst COVID-19 Pandemic**

With the asynchronous/offline time in the flexible learning modality in school, there were more opportunities to attend to caregiving tasks while accomplishing school-related tasks.

Most of the tasks employed by the government employee participants range from those tasks employed also by the students, and navigating complex health care assistance with household tasks, self-care and supervision tasks, medical care tasks, and coordination tasks. As resilient beings, they are able to maneuver situations to benefit older adults, the informal caregivers themselves, and other significant others.

This supports the results of the study that caregivers who attempt to balance caregiving with other activities, such as work, family, and leisure, may find it difficult to focus on the positive aspects of caregiving and often experience more negative reactions, such as an increased sense of burden<sup>[9]</sup>.

Regardless of amount of care provided, caregivers may become increasingly more distressed if they are unable to participate in valued activities and interests. More than half of adult children who provide parent care are employed. Caregiving responsibilities can have a negative effect on work roles as caregivers adapt employment obligations to manage and meet care demands. Caregivers who are employed report missed days, interruptions at work, leaves of absence, and reduced productivity because of their caregiving obligations. They have difficulty maintaining work roles while assisting family members. On the other hand, employment provides some caregivers respite from ongoing care activities and serves as a buffer to distress<sup>[10]</sup>.

In the first theme, participants expressed a dominance of priority-setting over labyrinthine tasks. Informal caregiving is not an easy job. In OECD<sup>[11]</sup> Health at a Glance, everybody is likely to become an informal carer at some point over one's life course. It is possible to distinguish between different care relationships in informal care: (a) adults of working age who are caring for older parents, family members, neighbours or friends; (b) individuals of pension or higher age who are caring for their partner, family members, neighbours or friends; (c) youth caring for their parents or grandparents or other family members; and (d) paid non-professional caregivers who are replacing or complementing care provided by the family. According to European surveys, about 40-55 per cent of informal carers are adult next-of-kin (daughters, sons, in-laws), depending on the country, 20 to 45 per cent are partners. Siblings, friends or neighbours are also providing unpaid care and the majority of unpaid care is provided by women<sup>[12]</sup>.

One commonality among the employed subjects aged 40 above is their sense of responsibility to decide on the medications of the older adults. Johanna, Olga, Tracy, Madonna and Susan confirmed that with years of witnessing medical consultations and drug prescriptions of the care recipients, they are able to decide on which to give and which is not. As responded, "kung ano yung prescribed by doctor, at kadasalan yung hiyang. Kahit parehas ang generic name, may preference silang brand."

As these individuals provided descriptions of their experiences, they often spoke empathically about their identity as geriatric informal caregiver. Majority of the participants prioritized the care receivers over work and self.

Caregiving is a labor of love, and the students and employees have tasks and jobs outside the home. This can lead to conflict between their divergent responsibilities, which can result in high levels of stress, tardiness, disruptions of their workdays, and even perhaps negative health effects for them as well. It is paramount that they are equipped with prioritization to care for both themselves and their loved ones.

### **Care Culture Only in the Philippines**

Providing geriatric care during COVID-19 pandemic demands much tasks from participants in this study, yet the unwavering dedication to serve their loved ones are unquestionable in the Philippine care culture.

The tradition of caring for the older adults still lingers in Filipino families. They enjoy a significant amount of care and unending support from their children and spouse, as long as he or she is still alive. Family support comes in many forms like financial support, companionship and assistance. As stated in Article XV (Family) Section 4 of the Philippine Constitution, "The family has the duty to care for its elderly members but the State may also do so through programs of social security."

Under Republic Act (RA) 9994 or the Expanded Senior Citizens Act of 2010, it states that (d) To encourage their families and the communities they live with to reaffirm the valued Filipino Tradition of caring for the senior citizens; (e) To provide a comprehensive health care and rehabilitation system for disabled senior citizens to foster their capacity to attain a more meaningful and productive ageing.

Participants in the study exhibited close family-ties through the usual set-up in the household where the older adult live with their children and rely on them for care and support. That is expected from a family member because he/she has been taken cared of during childhood years. Self-sacrificing ideation is a family members' selfless passion to provide quality care to an older adult as a sign of reciprocity.

All I can say is, before, my grandma and my family are the ones who took care for me. As I grow older I am the one who's taking care of them specially my grandma. (Jonas)



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I don't get paid because it is my responsibility as her daughter, and I am happy to take care of her. (Johanna)

She took care of me when I was younger, now that she is sick I will also take care of her (Anita)

With the absence of both my parents, I was at the care of lola. It not sacrifice but a way of giving back the goodness they have given me. (Tracy)

None of my siblings chose to stay with our parents. They live out of town and overseas for greener pasture so they can provide for medical needs of our parents. My family stays with mama, and I voluntarily accepted the fate of being her caregiver because I wanted it; I have to, as a sign of my love for her. (Madonna)

Filial caregivers often reminisced about positive parental identity, reciprocal relationships, and engagement in meaningful filial relationships. Such caregivers drew on these beliefs and perceptions, and transactions as they entered the filial caregiving role. They expressed a sense of "choice" and "opportunity" in assuming this role.<sup>[13]</sup>

Part of the care culture is not only for the older adults alone, but for the family caregiver as well. The participants receive material and non-material support from their family members, school mates/workmates, and the community people.

### **Support Extended by Family Members**

Family members extend material support which includes money given by relatives, vitamin supplements, cooked foods and grocery packs. Money is the relative's way of saying 'thank you for taking care of.' which then serves as motivation for the informal caregiver to continue the journey on geriatric care. This usually happens in an unexpected way, and only those relatives that have the capacity to give money do this. This generosity in financial aid is also an element of reciprocity that is common in the Philippines. You do good, and kindness will go back to you (the informal caregiver).

Supporting the results of this study by emphasizing that it is plausible for positive consequences, such as rewards and satisfaction buffer the negative effects of caregiving. Positive aspects of caregiving are important; some researchers are now using a caregiver rewards scale to better understand caregivers' experiences.<sup>[14]</sup>

It is their way to say thank you. (Conrad)

My uncle gives me money to buy cellphone. He let me accept this money, thanked me for taking care of lola. (Jasmin)

They gift me with money. If I need money, I ask and they give me. (Jonas)

My siblings voluntarily give money for mom's needs. (Johanna)

Nagbibigay sila kahit maliit na halaga bilang pandagdag sa panggamot ni mama ko. (Anita)

Generally, the participants were extended of financial help from their relatives. These were voluntarily given as token of gratitude from the sacrifices despite performing duties as students and government employees.

For the non-material support from family, time spent for a few minutes of talking is a manifestation that informal caregivers have to know that they are not alone. Other caregivers share these feelings. Talk with someone if your feelings get in the way of daily life. Maybe you have a family member, friend, priest, pastor, or spiritual leader to talk to. Your doctor or social worker may also be able to help.<sup>[15]</sup>

My family calls me, asking if there still is food in our house, always asking if we are OK. (Jasmin)

They message me and send regards, it is not financial but moral support from them is indeed a good thing to receive. (Conrad)

My siblings call us every now and then. We have continuous communication. And we try solving problems if we can. (Johanna, Tracy, Madonna, Olga)

By talking to them, it eases the emotional burden especially when I cry to them. (Tracy, Olga)

The data is supported by Northfield & Nebauer 2010<sup>[16]</sup> caregivers who received little emotional support often times had negative feelings regarding their role and responsibility. Whereas, those with support both emotionally and physically had more positive feelings. Care culture in the Philippines reflects an image of "malasakit" and "pakikiramdam" that means relatives do not only worry and think of the older adults cared of but the one who takes care of them, too.

### **Support Extended by Classmates/Workmates**

Care culture in the Philippines is also in the form of moral support. Filipinos may not lend money or offer any financial help because it's not even enough for their own families, yet they easily extend the support that money cannot buy.

My classmates made me feel I was not alone during my battle in the hospital. They always text me and ask, "Kumusta ka na?" Kaya mo yan (Marga)

They (classmates) always cheer me up, and always ask if I am OK. (Conrad)

My classmates and friends support and help me by reminding me of due dates of learning activities, They always message if how am I, and always give regards for me. (Jonas)

Mangungumusta sila palagi through FB messenger. We video chat if there is enough load. (Anita)



## **Labyrinthine Geriatric Informal Caregiving amidst COVID-19 Pandemic**

They ask how we are faring. They also ask me if I need anything, they can buy for me. (Johanna, Olga, Tracy, Madonna, Susan)

For most Filipinos, care and thought is important to be able to know what else other people need, be it food, money, service, and prayer. For these geriatric caregivers, they also deserve the care that they give, be it from friends, classmates, and workmates. Reaching out is easy because of technology. Coordination is faster and more organized because of technology. No matter where these people are, there is always a way for them to bring communication faster and closer. This is how Filipinos care for each other, with and without pandemic.

### **Support Extended by Community People**

Community people contribute more of the non-material support like doing favors for running errands like bills payment and store purchases. Civilian Volunteers Organization (CVO) became more visible as they wait for the Barangay Chairman's signal on which residence needs assistance. Vitamin packs from Rural Health Unit were also given for the COVID-19 positive and their family members.

Nagbibilin sa kapit-bahay kung mamamalengke sila. (Olga)

Nagpapabayad ng kuryente, tubig at cable (Susan)

Nagpapasabi sa Brgy. Health Worker na baka meron nang Vitamins para sa amin. (Tracy, Olga, Johanna)

Engaging in a harmonious relationship with the neighbors or community people is advantageous in times of dire needs. They are of huge help in emergency or unexpected situations, and in simple but important errands. They serve as essential support during that provides relief to the informal caregivers as there are people they can depend on.

The data is supported by the concept of social capital by political scientist Putnam. Community with high social capital is characterized by the existence of dense and strong social networks, high involvement in these networks, and strong norms of reciprocity and generalized trust between people. Therefore, social capital can be useful as a conceptual tool in local policies for social sustainability. Reciprocity is created by the obligations that are almost always involved in social networks<sup>[17]</sup> indicating that when people interact in social networks, norms of reciprocal help and support become the glue that holds the network together.

### **Work and Life Balance is Essential**

Students and government employees in this study experience difficulties and challenges as informal providers of care to older adults. Hurdling everyday mysteries of geriatric life becomes unknown if caregivers are unprepared of the possibilities, yet demystifying efforts are translated to priorities of serving the older adults unconditionally until they attain a period of balance.

Knowing about what purpose they have in the lives of the care receivers moulded the notion and worth of what it is to be called informal caregivers. How they receive treatment from their significant others is vital in the maintenance of sound body and mind.

Getting enough as much as possible is vital in the life of the informal caregivers.

Sometimes yes and sometimes no, due to many responsibilities that I need to perform. But I sleep at noon break. (Jasmin)

I sleep 7-8 hours; it's enough to gain my energy back. (Conrad)

Yes, I sleep well. But there are times when my grandma is not feeling well I wake up in the middle of the night to comfort and provide her of things she needed. But I sleep once she sleeps back. (Jonas)

I tried my best to get some sleep because I know I need it. (Olga, Tracy, Madonna, Susan)

An online article, Taking Care of YOU: Self-Care for Family Caregivers, caring for the self is one of the most important and one of the most often forgotten things one can do as a caregiver. When the needs are taken care of, the person cared for will benefit, too. Family caregivers of any age are less likely than non-caregivers to practice preventive healthcare and self-care behavior. Regardless of age, sex, and race and ethnicity, caregivers report problems attending to their own health and well-being while managing caregiving responsibilities.

Surprisingly, the participants in the study are able to balance work and life despite the tasks they perform in caregiving. They are able to achieve this because of the unwavering contributions of their classmates/workmates, community people, and most especially the family members.

### **Vital Contributions of Family Members in Geriatric Caregivers' Work and Life Balance**

There would be no one else reliable than a family that constantly provide strength and support all throughout the informal caregivers' service to the older adults. Highly sensitive ties therein, the family members are aware of what and when the informal caregiver needs help. It is their own way, too, of returning favour to the sacrifices done to the family.

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By providing encouraging words from the talks they had with their family members, their freewill were strengthened to carry on with the tasks while taking change of their own lives. Family members' motivating acts of kindness provided more reasons to stay with the older adults and be their constant companion.

Blessed are the informal caregivers for having the right and good people around to extend help in any way possible. True enough, caregivers who received little emotional support often times had negative feelings regarding their role and responsibility. Whereas, those with support both emotionally and physically had more positive feelings.

Lagi po nila tinatanong kung ano kailangan ko. Tyagaan ko raw po na magsilbi kay lola para may kasama sila. (Jasmin)

Nagpapasalamat sila sa pag-ako ko ng responsibilidad. Masaya na po ako dahil nakikita nila yung pag-aalaga ko kay lola (Marga)

Nagdadala sila ate ay kuya ng ulam para hindi na raw ako magluto para kina papa at mama. Tapos nagbibigay sila ng mga pagkain. (Olga)

Masaya na po ako na kinukumusta nila ako lagi, at nakikita nila na gusto ko ginagawa ko at hagna daw sila sa akin. (Anita)

### **Vital Contributions of Classmates/Workmates in Geriatric Caregivers' Work and Life Balance**

Geriatric informal caregivers have classmates/workmates that happen to be thoughtful and supportive of all their activities. This humble gesture of assistance to ease the anxiety that highly impede the quality of work both as a caregiver and a student/government employee, made a huge difference in their lives.

Lagi silang nakasuporta sa akin kung may activity na hindi pa ako nakasubmit, nagreremind sila sa akin. (Jasmin)

Pinaparamdam ng classmates ko na hindi ako nag-iisa, at lagi sila nangungumusta. (Marga)

They always cheer me up and say "hi" at the same time ask me if I'm OK. (Conrad)

They always ask what we need, and reach me out through text, call and offer prayer. (Johanna)

By inspiring conversations with their friends/ classmates/workmates, they are able to reflect on these and more determined to assist the older adults while they are still alive. By including them in their family members' and friends' players, they are provided with spiritual arm to regain the weakened faith because of trials and tribulations. By lifting up the wearied spirit through sharing God's words, they are revitalized and renewed for another day of service.

Colleague support may be ingrained in the culture of the workplace, since workers in a family-friendly organization may value work-life balance and be more understanding of the demands of informal caregivers' families. Group-level resources include support from colleagues, which are important for individuals' work-family conflict. <sup>[18]</sup>

### **Vital Contributions of Community People in Geriatric Caregivers' Work and Life Balance**

Community people in the Philippines for most rural areas consists of interpersonal connections and face-to-face encounters that are governed by customary social norms and produce an overall cooperative social structure. During the community lockdown period, geriatric caregiving concerns were mostly on how to facilitate the transport of goods to the older adults' homes.

By community people's volition and kind-heartedness to grant errands requests, they are able to accomplish more of household chores plans. These are the most notable vital contributions of the significant others in the life of the informal caregivers.

Pinakiki-usapan po yung tricycle driver na dalhin sa bahay yung mga pinamili tapos babayaran na lang yung pamasaha nung goods. (Jasmin)

Nakikisuyo sa mga kapit-bahay na magpadala ng bibilhin kung may nakalimutan, pati pagpapaload pinasusuyo rin. (Olga)

Nagtatanong mga kapit-bahay kung may ipadadala kami, usually mga gamot, tinapay ganun. (Tracy)s

Nanghihingi kami ng mga dahon ng malunggay, kamote, ampalaya na mga tanim nila sa bakod para hindi na bilhin pa sa talipapa. Kapag naluto na yung tinola nagbibigay kami. (Susan)

This indicates that living in a neighborhood with high social capital seems to be protective when it comes to maintaining wellbeing during times of crisis. Several studies from various countries have found protective effects from social support and social networks during the COVID-19 pandemic.<sup>[19]</sup> The respondents who experienced very poor health could have been less likely to participate in a telephone survey or even to answer the call, resulting in a potentially healthier and unrepresentative sample of people participating in our study.

Findings from this study indicate that neighborhoods with high social capital seem to be more resilient to crises like the COVID-19 pandemic. This corresponds with findings from previous research, suggesting that a high level of social capital promotes health. <sup>[20]</sup> Previous research also found that social capital can contribute to resilience in times of crises. Aldrich and

## Labyrinthine Geriatric Informal Caregiving amidst COVID-19 Pandemic

Meyer<sup>[21]</sup> demonstrate several examples (mainly of natural disasters) where strong social capital within and across social groups has proven important both during crises, through mobilization and sharing of resources and knowledge, and for rebuilding and recovering in post-disaster communities

### VII. CONCLUSIONS

According to the present reviews, all entities have contributed to the geriatrics informal caregivers labyrinthine tasks.

1. Geriatric informal caregiving is a complicated task served with priority because of the responsibility they embrace.
2. Informal caregivers received material and non-material support from family members, class/workmates, and community people who are traditionally care culture elements.
3. Providing motivational words and actions from family members, class/workmates, and community people contributed much in the balanced work and life of informal caregivers.

### ACKNOWLEDGMENT

I owe a deep sense of gratefulness to Dr. Erwin Estrella, my classmates in Doctor of Education major in Guidance and Counseling for providing admirable enthusiasm and dynamism to sail through the waves of challenges in this journey, and to the geriatric informal caregivers involved in this study, you are all highly appreciated for the willingness to take time despite the busy schedules as students and employees to have conversations with me. Your stories are proudly what care culture is all about in Pinoy families; my hats off to these modern heroes

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## Development of Neuroxellar Algorithms for Adaptive Pi Adjustable Speed Control Parameters in Mining



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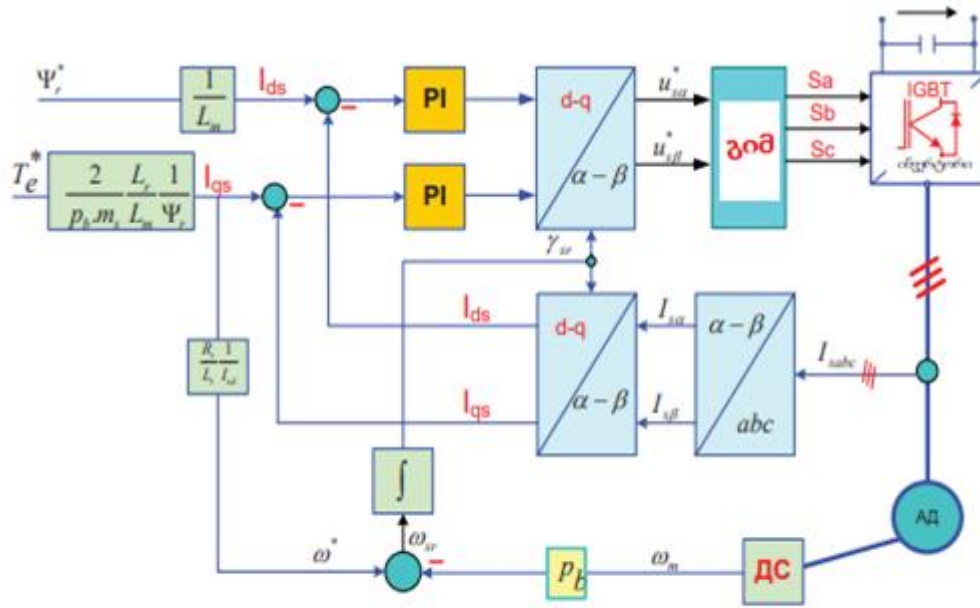
**ANNOTATION:** This article discusses the adaptive Pi regulator based on the basic function of a neural network (RBF) and it is used to control the velocity of a vector directional asynchronous motor. The structure of the control circuit consists of the RBF identifier of the standard Pi controller. The RBF Identifier is used to identify the Jacobian meaning of the asynchronous motor online. The "online" change of neural network parameters is performed by the gradient access method without prior training. Pi controller training is performed by using the "online" identification RBF model. It is advisable to test this controller under different conditions to finally make sure the reliability of the management technology we offer. Research has shown that the proposed controller provides good steadiness and stability of the steering system compared to what a conventional Pi controller provides.

**KEYWORDS:** RBF neural network Pi regulator, Pi control algorithm, Pi controller, inverted neural control, Pi regulator, RBF neuro-based Pi regulator, asynchronous motor. Nowadays, applied technologies of artificial neural networks are developing with special dynamism in the theory of intellectual computing. The following advantages of neurocellular approaches can be noted:

- Acceleration obtained as a result of parallel processing of information;
- Resilience to changes in management facility and environmental parameters;
- Reliability due to the abundance of system elements;
- Ability to use information hidden in the management object.

Multilevel network models have been developed in this direction, the prototypes of which are the functioning of the structures and mechanisms of biological nervous systems. They are used as a basic methodology to increase the management speed of various technical devices, which ultimately allows us to create super-fast control systems. Practice has shown that relying entirely on the application of a homogeneous neural network theory in the process of creating complex object management systems cannot lead to the desired results; that is, before creating a neural system of management that is close to or exceeds the results achieved using classical management systems. Modeling such networks requires large volumes of computing resources. To do this, it is advisable to use neuro-cellular devices, one of the components of the control system, or to use the decision-making modules that transmit the output signal, not directly related to the artificial neuro-network. Now let us analyze the use of artificial neuroxel, in the role of a neuroxell observer in the ventilation process with asynchronous electric motors of coal shafts.

The vector model of this process can be given the following form. Fig.1



**Fig. 1. Indirect field management block diagram**

Transverse pulse modulation  $S_a, S_b, S_c$  inverter voltage source switch states:

Where  $P_p$  is the number of poles motor

- $\gamma_{sr}$  - The vector angle of rotational flow
- $\omega_{sr}$  - Angular velocity of the rotor flow vector;
- $R_r$  - Rotor resistance during short circuit;
- $L_r$  - Rotor scattering inductance;
- $L_m$  - Main inductor of the rotor;
- $\psi_s$  - The vector of stator flow;
- $\psi_r$  - The vector of the rotor flow
- $T_e$  - Electromagnetic moment
- $M_c$  - static loading moment;
- $\omega_m$  - Angular rotational frequency of the rotor;
- $J$  - moment of inertia of the electric motor.

Unlike direct vector management, indirect vector management is one of the most popular methods in the manufacturing field where required

$$\begin{aligned}
 U_{qs} &= R_s i_{qs} + \frac{d}{dt} \Psi_{qs} + \omega_{sr} \psi_{qs} \\
 U_{ds} &= R_s i_{ds} + \frac{d}{dt} \Psi_{ds} + \omega_{sr} \psi_{qs} \\
 U_{qr} &= R_r i_{qr} + \frac{d}{dt} \Psi_{qr} + (\omega_{sr} - \omega_m) \psi_{dr} \\
 U_{dr} &= R_r i_{dr} + \frac{d}{dt} \Psi_{dr} + (\omega_{sr} - \omega_m) \psi_{qr}
 \end{aligned}
 \tag{1}$$

The main method of the Field Oriented Control (FOC) method is the transformation coordinate method. The power vector is measured by the real coordinate  $\alpha$ - $\beta$ .

Therefore the power components  $I_{\alpha}, I_{\beta}$  must be converted to a rotating d-q system. Similarly, the support voltage vectors  $U_{\alpha}, U_{\beta}$  must be converted from the d-q system to the  $\alpha$ - $\beta$  system. The  $\gamma_{sr}$  angle of the rotor flow is required for these transformations. According to the result of this angle (obtained by calculation), managing can be two types: Direct ThoseareDirect Field Oriented Control (DFOC) and Indirect Field Oriented Control (IFOC) methods. The  $\gamma_{sr}$  angle of the rotor flow is obtained by reference  $I_{ds}, I_{qs}$  currents. The angular velocity of the rotor flow vector is calculated by the following formula:

$$\omega_{rs} = \omega_{sl} + p_b \omega_m \tag{2}$$

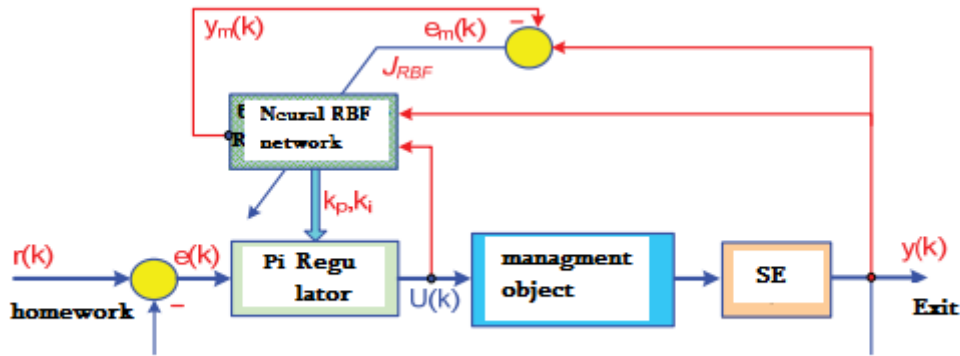


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$$\omega_{rs} = \omega_{sl} = \frac{1}{I_{sd}} \frac{R_r}{L_r} I_{sq} \quad (3)$$

**Developing algorithms for neurocellular adaptation of Pi regulator parameters for asynchronous motor speed control.**

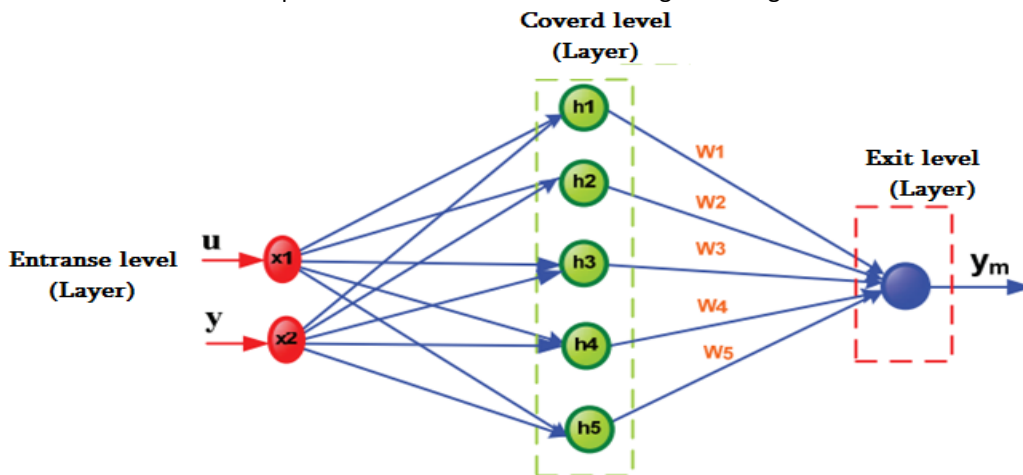
Pi controllers are widely used in the management of dynamic objects, particularly in the management of asynchronous motors. The use of classic Pi regulators still has some limitations. The article discusses the Pi regulator, which is based on the use of a neural RBF network when driving an asynchronous motor. The system management structure (for parameter management) using the neural RBF network is given in Fig.2. It is an intelligent Pi regulator that uses the operation of a neural RBF network.



**Fig. 2. RBF network dependent Pi regulator.**

$r(k)$  - assignment,  $e(k)$  - constraints,  $U(k)$  - signal management,  $y(k)$  - exit to the control object,  $y_m(k)$  - RBF identifier at the output.

The RBF network of the radial base function is a three-layer supply of artificial neurons that use the radial function as the activation function. The output signal from the network is a linear combination of the radial base function at the input and the neuron (as parameters). Radial basic functional networks also have multiple uses, approximation function, time series prediction, classification and system control. It has a quick self-learning ability as well as avoiding the problem of local minimums in the system management area. Therefore, the RBF - neural network is used in the development of control parameters in the Pi regulator settings. RBF - The neural network has three levels: input, covert, and output. Let's assume that our RBF neural network has 2 input levels, 5 hidden levels and 1 output level. The network structure is given in Fig. 3.



**Fig.3. Neural Network RBF**

In addition, the Jacobian matrix is used in the management strategy to adjust the parameters of the Pi regulator. The design network RBF, as already mentioned, consists of three levels (layers): entrance, covered and exit (see Fig. 2). We have two inputs in this grid so the input vector will look like this:

$$X = [x_1, x_2, \dots, x_i]^T = [u, y]^T; \quad \{i = 1, 2\} \quad (4)$$



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The function of the activator in the RBF neural network is performed by the Gaussian function. Neurons covered by the Gaussian function are realized as basic functions and radial basal vectors  $H = [h_1, h_2, \dots, h_j, \dots, h_s]^T$  can be expressed by the Gaussian function as follows:

$$h_j(x) = \exp\left[-\frac{\|x - c_j\|^2}{2b_j^2}\right]; \quad \{i = 1, 2, \dots, 5\} \quad (5)$$

Where  $X$  - is the input vector of the neural network  $C_j = [c_{j1}, c_{j2}]$  - is the vector of the  $j$ -node on the coated layer,  $b_j$  is the width of the  $j$ -node of the coated layer  $a_j$  - is the number of neurons on the coated level (this Index variables are used in formula (17)).

Therefore, the network output can be formally described as:

$$y_m(k) = \sum_{j=1}^J w_j h_j(x) \quad (6)$$

Where  $w_j$  - are the weights of the RBF neural network. The functionality of the productivity index can be given as follows:

$$E(t) = \frac{1}{2} [y(k) - y_m(k)]^2 \quad (7)$$

Where  $y(k)$  - is the ideal output. If we use the gradient access method, the RBF neural network parameters will be updated as follows:

$$\begin{aligned} w_j(k+1) &= w_j(k) + \eta[y(k) - y_m(k)]h_j + \alpha[w_j(k) + w_j(k-1)] \\ c_{ij}(k+1) &= c_{ij}(k) + \eta[y(k) - y_m(k)]h_j w_j \frac{(x_i - c_{ij})}{b_j^2} + \alpha[c_{ij}(k) + c_{ij}(k-1)] \\ b_j(k+1) &= b_j(k) + \eta[y(k) - y_m(k)]h_j w_j \frac{\|x_i - c_{ij}\|^2}{b_j^3} + \alpha[b_j(k) + b_j(k-1)] \\ \frac{\partial y(k)}{\partial u(k)} &\approx \frac{\partial y_m(k)}{\partial u(k)} = \sum_{j=1}^m w_j h_j \frac{c_{1j} - x_1}{b_j^2} \end{aligned} \quad (8)$$

Where  $x_1 = u(k)$ ,  $\eta \in (0, 1)$  - is the network learning velocity,  $\alpha \in (0, 1)$  - is the momentum coefficient. Jacob's matrix algorithm is given by the formulas [13,15]. The parameters of the Pi regulator are determined by the Jacob matrix of the control device, which is obtained by identifying the RBF neural network.

It is known that the output of the Pi regulator depends on the  $k_p$  and  $k_i$  parameters. Much depends on the correct selection of these parameters for the efficient operation of the Pi regulator. In the RBF neural network it is possible to select the  $k_p$  and  $k_i$  parameters in different situations using the Jacob matrix. Formulas [7, ..., 14]

First of all, the expected error function in the network is defined:

$$E(k) = \frac{1}{2} [r(k) - y(k)]^2 \quad (9)$$

The  $k_p$  and  $k_i$  parameters are then selected using the iterative gradient assumption method as follows:

$$\Delta k_p = -\eta \frac{\partial E}{\partial k_p} = -\eta \frac{\partial E}{\partial y} \cdot \frac{\partial y}{\partial u} \cdot \frac{\partial u}{\partial k_p} = \eta e(k) \frac{\partial y}{\partial u} \cdot xc_1(k) \quad (10)$$

$$\Delta k_i = -\eta \frac{\partial E}{\partial k_i} = -\eta \frac{\partial E}{\partial y} \cdot \frac{\partial y}{\partial u} \cdot \frac{\partial u}{\partial k_i} = \eta e(k) \frac{\partial y}{\partial u} \cdot xc_2(k) \quad (11)$$

Where  $\frac{\partial y}{\partial u}$  - is the Jacob matrix given by Equation (8).  $xc_1(k)$  and  $xc_2(k)$  - the values are the inputs of the Pi regulator. Their calculation formulas are given below.

Management Pi algorithm

In this algorithm, the error between the desired and actual values, as shown in Figure 2, is determined by formulas (12), (13) as follows:

$$e(k) = r(k) - y(k) \quad (12)$$

$$e_m(k) = y(k) - y_m(k) \quad (13)$$

Pi regulator inputs can be expressed as follows:

$$xc_1(k) = e(k) - e(k-1) \quad (14)$$

$$xc_2(k) = e(k) \quad (15)$$

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The gradient assumption method is used to determine the proportions  $k_p$  and integral  $k_i$ .

$$k_p(k+1) = k_p + \Delta k_p = k_p + \eta e(k) \frac{\partial y}{\partial u} \cdot xc_1(k) \quad (16)$$

$$k_i(k+1) = k_i + \Delta k_i = k_i + \eta e(k) \frac{\partial y}{\partial u} \cdot xc_2(k) \quad (17)$$

The Pi regulation algorithm is given as follows:

$$u(k) = u(k-1) + k_p\{e(k) - e(k-1)\} + k_i e(k) \quad (18)$$

Brief description of neural RBF network based (PID) regulation.

The zero-RBF network-based Pi regulation block diagram is shown in Figure 4. It can be divided into the following stages:

- At the selection stage, select each value (k);
- Calculate the network  $m$  outputs according to the selected values;
- To get the Jacob matrix by using equations,
- Pi regulator settings apply for Pi regulation;
- Send a command to an asynchronous motor;
- Multitude  $k=k+1$ .

The Pi regulatory block diagram of the neural RBF network is given in Fig. 4

### MODELING RESULTS

Computer modeling of a vector-asynchronous motor is performed using the MATLAB / Simulink package. IFOC and pulse were used for asynchronous motor ventilation. A comparison with the usual Pi regulation is given in Fig. 6.

We selected the standard parameters of the Pi regulator using the trial and error method, which we selected using the appropriate coefficients. For the speed controller these settings are  $k_p = 110$ ,  $k_i = 10$ . The frequency of the selector inverter is 5 kg, the nominal voltage of the intermediate circuit is 100 V. The selection time interval for modeling is  $T_s = 0,02$  ml.

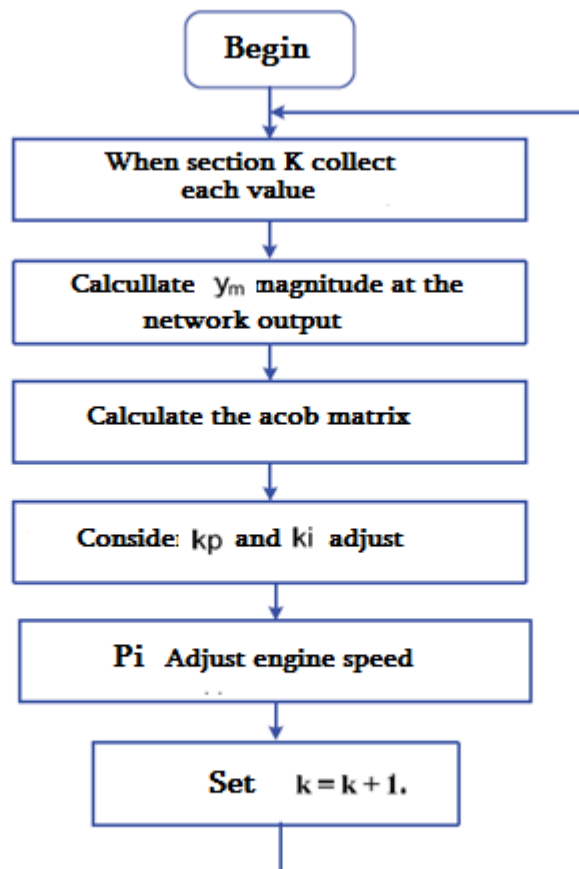
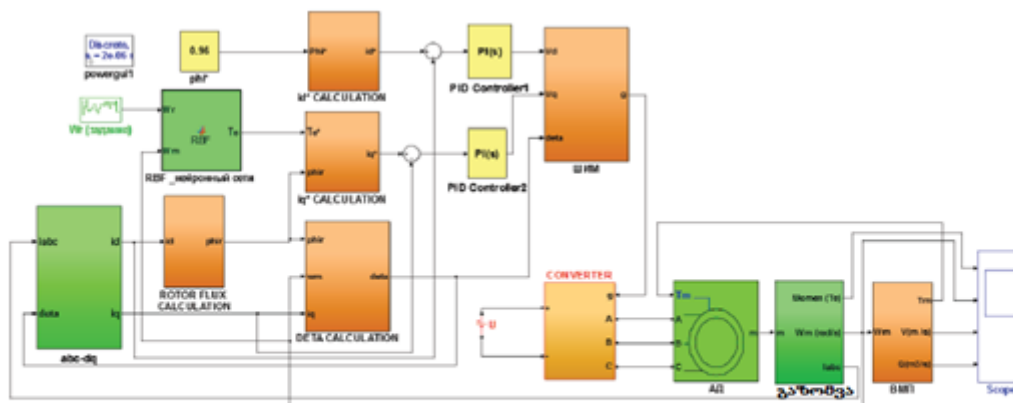


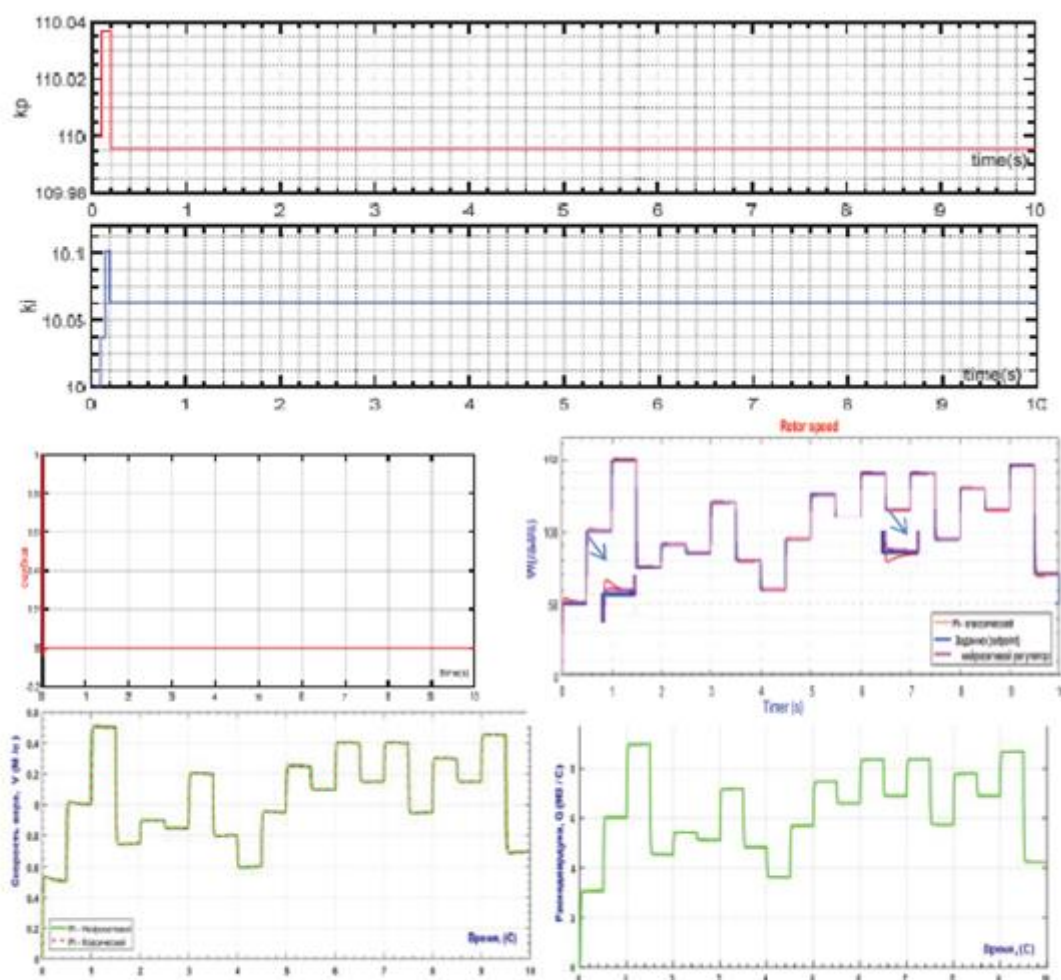
Fig.4. Block diagram of RBF neural network regulation

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Figure 6 shows that the induction motor of a motor assembled on a neural network requires less adjustment and also contains less stationary error than conventional steering. When setting up a neural network, control options can be selected online.



**Fig.5. Simulink model of control vector asynchronous motor**



**Fig.6. Neurocontroller modeling concepts**

Parameter name and unit of measurement	Meaning
1	2
Power, quota	25
Tension in volts	380/660
Rotation speed, r / min	3000
Network frequency, Hz	50-60
cos $\phi$	0,88
Multiplication of the initial check driving torque by the nominal	1,9
Minimum moment multiplication by the denominator	1,3
Multiplication of maximum moment with minimum	2,5
Moment of inertia (J), kg / m <sup>2</sup>	0,085
Relative mass, kg / kW	9,5
Stator active phase resistance $R_s, O_M$	0,455
Active impedance of the rotor $R_R, O_M$	0,413
Inductor of stator and rotor scattering	0,0048
Mutual inductance $L_\mu$	0,698
Fan diameter, m	0,6
Working area, m <sup>2</sup>	12,1

Managing the ventilation process of shafts in mining enterprises using neural networks ensures the creation of a normal production (working) climate in these enterprises and at the same time significantly reduces the economic costs of energy consumption.

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## On One of the Possible Ways to Improve the Agreement between Branches of Five-Port Waveguide Junctions



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**ABSTRACT:** At present, the requirements for flying machines, in terms of increasing flight speeds, maneuverability, and flight intensity, significantly expand the range of tasks to be solved by the radio-electric equipment of these machines. Therefore, during their design and construction, problems arise with the placement of a large number of antennas and radio-electronic devices. In addition, for maneuvering and flight dynamics, it is not allowed to place additional protrusions on the devices. From the obtained results, we can assume that the electrodynamic properties of the considered system can be changed by the variation of the system's feeding mode.

At present, the requirements for flying machines, in terms of increasing flight speeds, maneuverability, and flight intensity, significantly expand the range of tasks to be solved by the radio-electric equipment of these machines. Therefore, during their design and construction, problems arise with the placement of a large number of antennas and radio-electronic devices. In addition, for maneuvering and flight dynamics, it is not allowed to place additional protrusions on the devices.

One way to solve these problems is to create a complex, multifunctional, antenna-feeder system that incorporates aerial antennas, filters, switches, branchers, and control blocks, and provide the emission, reception, processing, and distribution of electromagnetic energy between various electrical devices.

In such complex antenna systems, it is possible to use high-frequency (ZMS) multi-port circuit breakers for power supply and removal, which have the ability to perform the functions of electromagnetic energy branches, collectors and transformers.

In order to increase the efficiency of multi-port waveguides embedded in radio-electronic and communication systems, it is first necessary to increase the bandwidth and reduce energy losses. In addition, when branching, dividing and converting the signal energy in such systems, it is necessary to ensure an acceptable agreement between different arms, that is, to pass a fairly high level of the working wave in the desired arm and suppress it in the others. Finally, for stable operation of the equipment, it is necessary to provide stable characteristics over a fairly wide frequency range [1 - 3].

The analysis carried out for different types of joints showed that an agreement acceptable for practice can be achieved only in a narrow band of frequencies and at a fixed ratio between the shoulder dimensions. Therefore, the task of ensuring a high-quality agreement is impossible to solve without constructive or other types of changes in the structure [4-7].

High-frequency devices lack the necessary elements for their operation, so their production must be preceded by computer design of the relevant electrodynamic structure, which includes three stages: 1. Mathematical modeling; 2. Analysis; 3. Optimization.

The aim of the present paper is to discuss one of the possible ways to improve the agreement between the branches according to the theoretical model developed for the five-port waveguide.

The structure under consideration is depicted in Figure 1

In order to vary the system construction and feeding modes, the so-called Logic multipliers for feeding and lateral branch orientation are introduced:

$p_1(j) = 1$  (corresponding areas of  $j = 1, 2, 3, 4, 10$  in Fig. 1) - means that the system is supplied with power from the corresponding branch,  $p_1(j) = 0$  - not supplied;

$p_2(j) = 1$  ( $j = 2, 3$ ) - means that the corresponding branch is connected from the bottom, and  $p_2(j) = 0$  - from the top.

Using the field notation in each region, using different tangential field continuity conditions and residual theory on dividing surfaces, we obtain a field representation by multiples of the fields scattered in adjacent branches:

## On One of the Possible Ways to Improve the Agreement between Branches of Five-Port Waveguide Junctions

$$E_y^{(1)} = E_y^{(10)} + \sum_{m=1}^{\infty} A_m^{(1)} \sin(\alpha_m^{(1)} x) \exp(ih_m^{(1)} z) \quad (1)$$

$$E_y^{(2)} = E_y^{(20)} + \sum_{m=1}^{\infty} A_m^{(2)} \sin[\alpha_m^{(2)}(x - L_1)] \exp((-1)^{p2(2)}) [ih_m^{(2)}(z - p2(2)b)] \quad (2)$$

$$E_y^{(3)} = E_y^{(30)} + \sum_{m=1}^{\infty} A_m^{(3)} \sin[\alpha_m^{(3)}(x - L_3)] \exp((-1)^{p2(3)}) [ih_m^{(3)}(z - p2(3)b)] \quad (3)$$

$$E_y^{(4)} = E_y^{(40)} + \sum_{m=1}^{\infty} [B_m^{(2)} + B_m^{(4)} \exp(-h_m^{(4)} L_1) + B_m^{(6)} \exp(-ih_m^{(4)} L_2)] \sin(\alpha_m^{(4)} z) \exp(h_m^{(4)} x) \quad (4)$$

$$E_y^{(5)} = p1(4) \sin(\alpha_{\mu2}^{(4)} z) \exp(-ih_{\mu2}^{(4)} x) + p1(10) \sin(\alpha_{\mu2}^{(4)} z) \exp(-ih_{\mu2}^{(4)}(x - L_2 - a)) + \\ + \sum_{m=1}^{\infty} \overline{A_m^{(1)}} \{u_m^{(1)} \sin(\alpha_m^{(1)} x) \exp[ih_m^{(1)}(b - z)] - \sum_{n=1}^{\infty} u_{mn}^{(2)} [\exp(-ih_n^{(4)} x) - (-1)^m \times \\ \times \exp(-ih_n^{(4)}(x - a))] \sin(\alpha_m^{(4)} z)\} - i \sum_{m=1}^{\infty} \overline{A_m^{(2)}} \sum_{n=1}^{\infty} u_{mn}^{(3)} \sin(\alpha_n^{(4)} z) \exp(ih_n^{(4)}(x - L_1)) - \\ - i \sum_{m=1}^{\infty} \overline{A_m^{(3)}} \sum_{n=1}^{\infty} u_{mn}^{(4)} \sin(\alpha_n^{(4)} z) \exp(ih_n^{(4)}(x - L_2)) \quad (5)$$

$$E_y^{(6)} = \{A_m^{(6)} \exp(-ih_m^{(4)}(x - a)) + [B_m^{(6)} \exp(-h_m^{(4)} L_1) + B_m^{(4)} \exp(-h_m^{(4)} L_2)] \times \\ \times \sin(\alpha_m^{(4)} z) \exp(ih_m^{(4)} x)\} \quad (6)$$

$$E_y^{(7)} = p1(4) \sin(\alpha_{\mu2}^{(4)} z) \exp(-ih_{\mu2}^{(4)} x) + p1(10) \sin(\alpha_{\mu2}^{(4)} z) \exp(-ih_{\mu2}^{(4)}(x - L_2 - a)) + \\ + \sum_{m=1}^{\infty} \overline{A_m^{(2)}} \{v_m^{(1)} \sin[h_m^{(2)}(1 - p2(2))b - (-1)^{p2(2)} z] \sin[\alpha_m^{(2)}(x - L_1)] - \sum_{n=1}^{\infty} v_{mn}^{(2)} \sin(\alpha_m^{(4)} z) \times \times [\exp(-ih_n^{(4)}(x - \\ L_1)) - (-1)^m \exp(-ih_n^{(4)}(x - L_1 - a))]\} + \sum_{m=1}^{\infty} \overline{A_m^{(1)}} \sum_{n=1}^{\infty} v_{mn}^{(3)} \sin(\alpha_m^{(4)} z) \times \exp(-ih_n^{(4)}(x - a)) - \\ - \sum_{m=1}^{\infty} \overline{A_m^{(1)}} \sum_{n=1}^{\infty} v_{mn}^{(3)} \sin(\alpha_m^{(4)} z) \exp(-ih_n^{(4)}(x - L_2)) \quad (7)$$

$$E_y^{(8)} = \sum_{m=1}^{\infty} \{[A_m^{(6)} + A_m^{(8)} \exp(ih_n^{(4)} L_1)] \exp(-ih_n^{(4)}(x - a)) + B_m^{(2)} \exp(ih_n^{(4)}(x - L_2))\} \times \sin(\alpha_m^{(4)} z) \quad (8)$$

$$E_y^{(9)} = p1(4) \sin(\alpha_{\mu2}^{(4)} z) \exp(-ih_{\mu2}^{(4)} x) + p1(10) \sin(\alpha_{\mu2}^{(4)} z) \exp(-ih_{\mu2}^{(4)}(x - L_2 - a)) + \sum_{m=1}^{\infty} \overline{A_m^{(3)}} \times \\ \sum_{m=1}^{\infty} \overline{A_m^{(3)}} \{s_m^{(1)} \sin[h_m^{(2)}(1 - p2(2))b - (-1)^{p2(2)} z] \sin[\alpha_m^{(2)}(x - L_1)] - \sum_{n=1}^{\infty} s_{mn}^{(2)} \sin(\alpha_m^{(4)} z) \times [\exp(-ih_n^{(4)}(x - L_2)) - \\ (-1)^m \exp(-ih_n^{(4)}(x - L_2 - a))]\} + \sum_{m=1}^{\infty} \overline{A_m^{(1)}} \sum_{n=1}^{\infty} s_{mn}^{(3)} \sin(\alpha_m^{(4)} z) \times \exp(-ih_n^{(4)}(x - a)) - \\ - \sum_{m=1}^{\infty} \overline{A_m^{(2)}} \sum_{n=1}^{\infty} s_{mn}^{(4)} \sin(\alpha_m^{(4)} z) \exp(-ih_n^{(4)}(x - L_1 - a)) \quad (9)$$

$$E_y^{(10)} = E_y^{(100)} + \sum_{m=1}^{\infty} \{A_m^{(6)} \exp(ih_m^{(4)} a) + A_m^{(8)} \exp(ih_m^{(4)}(L_1 + a)) + \\ + A_m^{(10)} \exp(ih_m^{(4)}(L_2 + a))\} \times \exp(-ih_n^{(4)} x) \sin(\alpha_m^{(4)} z) \quad (10)$$

Thus, the stress vector in the entire physical area is represented by the coefficients of the reflected field in the side branches.

(1)-(10) field in the entire physical area meets the conditions:

1. represents the solution of the Helmholtz equation;
2. the condition of radiation;
3. zero boundary conditions on the metal walls of the joints;
4. The condition of field finitude in each bounded area.

It can be seen from (1)-(10) that the field consists of two components, the eigen numbers of one of which are the transverse wavenumbers of the corresponding side branch, and the other - of the main waveguide. From a physical point of view, the wave front bends on the surface separating the two environments, therefore, the electric field tension vector has two denominators, which is what is reflected in the images of the fields.

From the obtained results, we can assume that the electrodynamic properties of the considered system can be changed by the variation of the system's feeding mode.

## On One of the Possible Ways to Improve the Agreement between Branches of Five-Port Waveguide Junctions

### Drawings.

Fig. 1. Considered structure for different configurations of side branches.

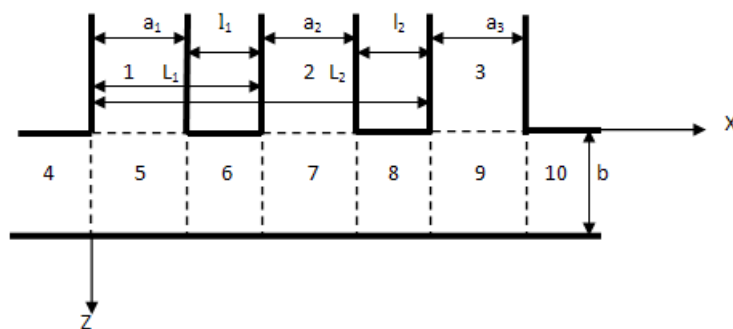


Fig. 1. a.

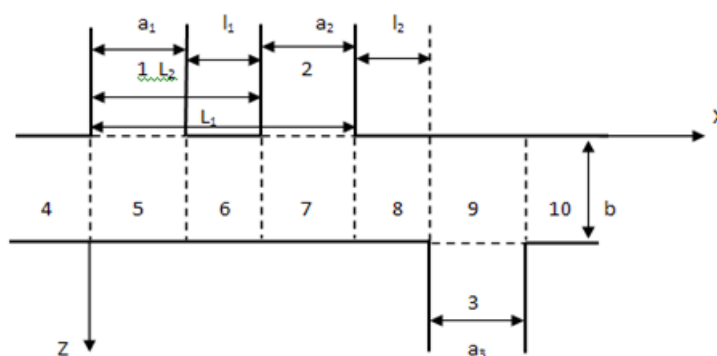


Fig. 1. b.

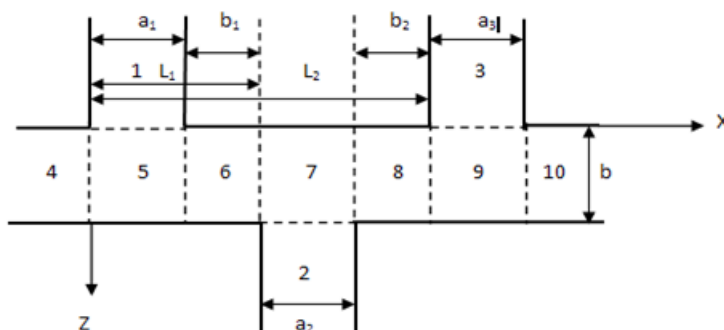


Fig. 1. c.

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## Challenges and Coping Strategies of Novice Teachers in Modular Distance Learning Modality



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**ABSTRACT:** The study was conducted to determine the challenges and coping strategies of novice teachers in modular distance learning modality in Urbiztondo, Pangasinan. The qualitative research design particularly the phenomenological research design was used in this study. The respondents of the study were ten (10) novice teachers from Urbiztondo who were chosen purposively based on their length of service in public school specifically those with 1 to 3 years of teaching experience. The analysis used three stages in the form of data reduction, data presentation, and data conclusion. The study revealed that novice teachers' challenges in modular distance learning modality are lack of printing materials, and supplies, time consuming, power interruption, parents not getting the modules, schedule not being followed, late submission, unanswered/unfinished modules, and unidentified answer sheets, dirty, damaged modules with torn and missing pages, academic dishonesty and difficulty validating learners' performance. Moreover, proper time management, staying positive and asking advice or guidance from a mentor are the strategies employed by novice teachers in order to cope up with the challenges in modular distance learning modality. In addition being flexible and knowing how to adapt to changes help them cope up with the challenges encountered.

**KEYWORDS:** Challenges, Coping strategies, Novice teachers, Modular distance learning modality

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### INTRODUCTION

The COVID-19 pandemic swept across the globe, bringing with it unprecedented challenges and impacts concerning not only the physical and mental health of populations but also every other aspect of human activity. [1] In the realm of education, lockdown or regional quarantine is used to lessen the coronavirus epidemic, especially in the children of tomorrow (Abdullah, 2020; Setiati & Azwar, 2020). Large-scale social limitations have replaced the lockdown system as the preferred method of preventing the spread of the Covid-19 virus (Yanti et al., 2020). The application of social distancing does indeed protect students, lecturers, teachers, and staff, to ensure the continuity of education (Iyer et al., 2020). Work from Home (WFH) was implemented to stop the spread of Covid19 in the educational setting.

The most recent blended learning approach, which is currently being used globally, is currently being adapted by the Philippine educational system. In response to the Coronavirus outbreak, there have been calls for an academic freeze, but the education industry is adamant that education should not be jeopardized. Teachers, particularly traditional teachers, are finding it difficult to cope with this pandemic. The world stopped and the economy collapsed as all businesses shut down operations. For instance, to prevent the virus from spreading, most countries closed schools, colleges, and universities. Not only were the health and education sectors affected by the crisis. Educational institutions provided remote learning as an alternative at the pandemic's height. Classes are held despite the shutdown order (Kasrekar, 2020).

Students' lives are significantly shaped by their education. One of the key components in delivering highquality learning is the teacher. Numerous changes occurred in the educational environment as a result of COVID19's establishment in the Philippines. The Department of Education's implementation of the manner of instruction is one of these. The pandemic has forced the majority of educational systems to find substitutes for in-person instruction and learning. Many educational institutions transferred their operations online so that instruction could continue even while schools were closed. [2]

The classroom teaching methodology has been completely changed. Now teachers are teaching students with the help of internet access by sitting at their home place. However, teachers have to face many challenges to accomplish the objective of teaching and learning. Conducting online classes is itself a great challenge for teachers who are habitual of conducting classroom teaching from many years.

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The transition of teaching and learning in schools to modular distance learning made it more difficult for school staff to provide a foundational, high-quality education. DepEd officials always seek out ways to address issues and provide teachers and school administrators with the skills they need to be more productive in the field of modular remote learning. [3]

Teachers, students, and parents faced a number of difficulties as a result of the deployment of modular instruction. In the midst of the pandemic, teachers are essential to maintaining the quality of education being provided. In the study done by Lapada et al. (2020), it was shown that teachers were very aware of the COVID-19 pandemic's existence and effects.[4] Teachers continue to assist pupils by creating modules as their learning guides despite the COVID-19 pandemic's risks. As a result, the teacher takes on a new role as a catalyst for the student's growth as a member of their society and community (Martineau et al., 2020). Malipot (2020), however, emphasized the need of teachers discussing their issues with modular distant learning. [5]

### OBJECTIVES OF THE STUDY

This study aimed to determine the challenges and coping strategies of novice teachers in modular distance learning modality in Urbiztondo, Pangasinan.

Specifically, it sought answers to the following questions:

1. How do novice teachers deal with the challenges in modular distance learning modality in terms of:
  - a. preparation;
  - b. distribution;
  - c. retrieval; and
  - d. assessment?
2. What are the employed strategies to cope with the challenges in their modular teaching modality?

### MATERIALS AND METHODS

The study used the qualitative research design particularly the phenomenological research design to determine the challenges encountered by novice teachers in modular distance learning modality.

#### Respondents of the study

The subjects of the study were ten (10) novice teachers from Urbiztondo with 1 to 3 years of teaching experience. They were chosen purposively based on their length of service in public school. They were given pseudonyms to ensure anonymity for their protection. The data gathered from the respondents were analysed qualitatively based on the context of the findings from each aspect of the study. Discussion of research results is at two elements 1) challenges in using modular distance learning modality, and 2) coping strategies in combating challenges in modular teaching modality. The analysis used three stages in the form of data reduction, data presentation, and data conclusion.

#### Research Instrument

The main instrument used was an open questionnaire. The questionnaire served as guide in interviewing the ten (10) novice teachers in Urbiztondo about the challenges they face and their strategies in coping with the challenges. The researcher asked consent from the teacher to be the respondent of the study. The researcher used interview method and used open questionnaire as guide in gathering data. A thorough transcription and analysis of data was conducted after the interviews with the respondents to make sense of the gathered data.

## RESULTS AND DISCUSSION

### CHALLENGES OF NOVICE TEACHERS IN MODULAR DISTANCE LEARNING MODALITY

**A. Preparation.** The table below shows the challenges faced by novice teachers during preparation of modules.

#### Challenges of novice teachers in the preparation of modules

Novice teachers' challenges in the preparation of modules are related to materials, and supplies, time and electricity which are needed to prepare and print the modules.

##### 1. Lack of printing materials/supplies

The lack of printing materials and supplies is the first and common challenge to all the respondents which is evident from their responses, as it affects the production of modules.

*"Kakulangan ng coupon para sa modules..." (Jane)*

*"Yung coupon, bitin ang supply kaya minsan kanya kanyang bili na..." (Ana)*

*"Kulang na budget para sa coupon at ink kasi may iba pang bayarin ang school..." (Fe)*

*"Kulang ang supply lalo na ang coupon para sa pagprint ng modules..." (Tina)*

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*“Limited supply ng ink kaya para makatipid nakadraft ang pagprint, malinaw din naman...” (Gel) “Lack of printer for fast reproduction...” (Ron)*

*“Kulang na kulang sa bilang ng estudyante yung supply ng modules galling division kaya need pa din magprint...” (Carla)*

*“Lack of modules, lack of coupon pati printer...” (Kat)*

*“Availability of printer with sufficient ink to be used in printing...” (Riza)*

*“Lack of coupon and ink, ang dami pa naman modules na piniprint...” (Jenny)*

Due to lack of supplies, novice teachers sometimes ask for help or donations such as bond papers and inks from private individuals. Some of them even bought the needed supplies from their own pocket based from the response of Teacher Ana.

### 2. Time consuming

Based from the responses, preparation of modules is time consuming.

*“Time consuming, di kaya matapos sa isa o dalawang araw lalo madami estudyante ko at ilan pa subjects. Saka hindi naman basta print agad yun kasi nga di ba kulang supply ng coupon kaya iaayos pa bago iprint...” (Jane)*

*“Hindi lang sa printing matagal pati na din sa sorting of modules kasi ipagpalagay mo na more or less 10 pages each per subject tapos 7 – 8 subjects pa...” (Gel)*

*“Minsan kahit weekends nagpiprint din ng modules para makumpleto kasi kung hindi gagawin yun madedelay pagrelease sa ibang modules...” (Ron)*

The lack of enough time in preparing and printing modules causes late production of other modules. In order to provide all the modules, novice teachers start printing as early as possible even during weekends.

### 3. Power interruption

Electricity also plays an important role during preparation of modules. Power interruption affects the production of modules.

*“Yung mga unannounced power interruption ang laking abala lalo pag nagpiprint ng modules tapos biglang magbrownout at ang tagal pa bago bumalik...” (Kat)*

If there is power interruption, the reproduction of modules is delayed that is why novice teachers sometimes print in advance some of the modules for the following weeks.

**B. Distribution.** After preparation, distribution follows. Teachers are tasked to distribute the modules to parents or guardians. In order to stay safe and avoid the risks of Covid-19 pandemic, schools implemented schedules of distribution and retrieval of modules. Parents or guardians are the ones who will get the modules and when entering the school premises they are all required to follow safety health protocols implemented by the school such as temperature check, wearing of face mask, sanitizing hands and maintain social distancing.

## Challenges of novice teachers in the distribution of modules

Novice teachers' challenges in the distribution of modules are connected with unclaimed modules and schedule not being followed. The respondents have the same experiences based from their responses.

### 1. Parents not getting the modules

*“May mga hindi kumukuha ng modules...” (Ana, Riza, Kat, Ron, Gel, Tina) “kasi wala daw maiiwan magbantay sa anak nila...” Riza added.*

*“Hindi lahat kumukuha ng modules...” (Jane, Fe, Carla, Jenny) “yung iba pumapasok din sa trabaho...” Fe added.*

There are parents who cannot get modules due to their work or no one will be left to look after their kids, and some are just not getting the modules. Specifically, Teacher Carla said:

*“Naiipon yung modules kaya pag nakuha na tambak na activities ang gagawin ng bata same din sa teacher pag binalik na yun tambak din na modules icheck...”*

With this challenge in the distribution of modules, some teachers ask help from other parents to give the modules to their neighbor and sometimes they are the ones who personally give modules at home and communicate to the parents in order to know their reasons of not getting the modules.

### 2. Parents do not follow the schedule

Some parents do not follow the schedule of distribution of modules and are always late in getting modules. This is because some are working too, sometimes they forgot the schedule or they have other appointment on the scheduled distribution day.

*“May mga hindi sumusunod sa schedule ng distribution...” (Ana, Ron, Jenny, Fe) “Merong kukuha lunchtime na at nanananghalian na kami...” Ron added.*

*“Minsan nga pauwi na ako nun tapos may dumating kukuha daw modules, pero understandable naman yun kasi galling pa sya sa trabaho at pauwi na din nagbakasakali lang na baka nasa school pa ako...” Fe added.*

## Challenges and Coping Strategies of Novice Teachers in Modular Distance Learning Modality

*“Nakakalimutan ng iba yung schedule or di kaya may ibang lakad sila kaya late sila nakakakuha”* Ana added. Teachers’ rest time and schedule for other school related activities is affected when the scheduled distribution is not followed. In order to address this challenge, teachers constantly update and remind parents in their group chats about the schedule of distribution of modules.

**C. Retrieval.** The retrieval of modules is done weekly in order to give enough time to finish the given modules. Just like in the distribution of modules, parents/guardians are the one to submit the modules. Below are the challenges encountered by novice teachers during retrieval of modules.

### Challenges of novice teachers in the retrieval of modules

The challenges encountered by novice teachers in the retrieval of modules were associated with the failure of following the schedule, unanswered or unfinished modules, unidentified answer sheets and damaged modules.

#### 1. Late submission / Failure to follow the schedule

Some parents don’t follow the scheduled submission day and some cannot submit on time due to unfinished activities.

*“Katulad din sa kuhaan ng modules, may mga hindi sumusunod sa schedule. Late kasi sila kumukuha ng modules kaya late din sila nagpapasa...”* (Jenny)

*“Late magpasa yung iba. May mga nagtetest or chat naman din na hindi muna sila makapagpasa kasi hindi pa daw tapos ibang activities or subject. Pinapakiusapan ko na lang din sila na ipadala na lang sa kamag-anak or kapitbahay mga natapos na nila para maisabay na din sa pagcheck bale to follow na lang mga di pa natapos...”* Jane

*“Late nagpapasa kasi may trabaho at minsan nalilimutandin nila schedule kasi busy din sila...”* Fe *“Walang magpapasa kasi hindi makaalis sa bahay dahil walang magbabantay sa mga bata, meron kasi yung iba may baby pa...”* Riza

Late submission or failure of submitting modules on time affects the teachers’ work schedule specifically in checking the modules.

#### 2. Unanswered/unfinished modules

There are some who submits unanswered or unfinished modules.

*“Meron mga modules na walang sagot, as in hindi nasagutan nilagyan lang ng pangalan. Minsan walang idea pa yung nagpasa na wala pala sagot module na pinasa kasi pinadala or pinasabay lang pala yun sa kanila...”* Carla

*“Yung may nagpapasa kahit hindi pa nasasagutan. Meron din hindi pa tapos pinapasa na although mas okay pa naman yun kesa sa wala talagang nasagutan. Yung iba hindi na talaga kaya tapusin kasi hindi na din nila alam, yung iba naman gahol na daw sa oras kasi pasahan na hindi pa natatapos dahil late nagstart magsagot ng modules...”* Tina

*“Hindi na tinitignan ng ibang parents kung nasagutan na ng anak nila yung module basta na lang nila ipapasa din...”* Ana

#### 3. Unidentified answer sheets

There are unidentified answer sheets due to failure indicating the name. Teacher Kat said:

*“Ang hirap i-identify kung kanino mga modules or answer sheets na walang names. May mga basta na lang din kasi naglalagay sa retrieval box na hindi man lang muna nagpapakita at nagsasign sa logbook...”*

#### 4. Dirty, damaged modules, torn pages

Dirty, damaged modules with torn or missing pages also add to teachers’ challenges as it causes the modules to be unreadable and the dirt might carry viruses that might affect the teachers’ health.

*“Madumi na yung modules pag pinapasa nila. Meron mga nabasa daw, hindi na readable yun kasi kumalat yung ink at may parang naapak-apakan or nailapag sa may putik. Hindi naman sa nandidiri ako ha pero kasi we’re not totally covid free and baka may virus na dala yun so mabuti na yung nag-iingat...”* Ron

*“Hindi na kumpleto yung pages ng module na binabalik. May mga napunit daw dahil nabasa or nabutas kasi nagdoodle sa module yung kapatid. Meron nga nung minsan may nagpasa ng basang module, nahulog daw nung paalis na sila kaya ako na nagpatuyo...”* Gel

In order to facilitate stress free collection of modules, teachers constantly remind parents of the schedule of retrieval. Whenever there are still unfinished activities, parents are encouraged to submit whatever they have finished and they can submit unfinished activities when they are done with it. For the unanswered or unfinished modules, teachers provide assistance and have open communication with parents to address their queries and other concerns. In addition, teachers always remind parents to double check the modules before submitting it, making sure that the name was clearly indicated. Also, make sure that the modules were place in a clean, dry place to avoid getting wet and dirty, torn and damaged.

**D. Assessment.** Teachers assess the learners in order to evaluate whether the educational objectives or competencies of the lessons were met.

### Challenges of novice teachers in assessment

The challenges faced by teachers in assessment were mainly academic dishonesty and difficulty in validating performance.

## Challenges and Coping Strategies of Novice Teachers in Modular Distance Learning Modality

### 1. Academic dishonesty

Academic dishonesty is the common challenge faced by novice teachers as they have the same responses when asked about assessment. They said: *“Magulang naman ang nagsasagot eh..”* *“Mga magulang ang nagmomodule..”* Specifically, Teacher Jane said:

*“Palagi perfect sa mga written assessments at activities sa modules pero halatang sulat ng magulang or guardian, meron pa nga yung iba kahit grade 1 pa lang cursive na ang sulat...”*

### 2. Difficulty in validating performance

Validation of learning or performance is also difficult since there are assessments and modules answered by parents, guardians or tutors not the learners themselves.

*“Nung modular na, madami tumaas ang grades pero hindi naman lahat yun eh sigurado if talagang performance ng bata kasi nga walang face to face...”* Carla

*“May mga estudyante ako na halata naman sa mga sinagutan nila na talagang sulat ng bata pero hindi pa din nakasisiguro kung lahat nga ay bata talaga nagsasagot kasi may naexperience ako one time na nasama sa naipasa yung papel na may nakasulat na mga sagot at halatang sulat ng matanda yun so pinapakopya na lang pala nila yung sagot para magmukhang yung bata ang nagsagot...”* Tina

With this situation, teachers humbly ask and remind parents and guardians not to answer the learners' assessment, but to facilitate and guide them while they are answering. Teachers even conduct “virtual kamustahan” with the learners or home visitation when they have their free time.

Some of the results of this study particularly in the challenges in preparation and retrieval of modules is consistent with the findings of Castroverde and Acala (2021). [6] Furthermore, with regards to the challenges in assessment, the responses corroborates with the findings of Guangul et. al. (2020) that one of the challenges identified in assessment was academic dishonesty. [7]

## COPING STRATEGIES OF NOVICE TEACHERS IN MODULAR DISTANCE LEARNING MODALITY

Novice teachers faced many challenges in this new normal education brought by Covid-19 pandemic. Teachers employed different strategies in order to overcome stress and cope up with the many challenges in modular distance learning modality.

**Time management.** Proper time management is common answer of all the respondents as it is very important in order to ease their daily tasks as teachers. *“Meron akong weekly task schedule na sinusunod, and I make sure na tapusin mga task ko sa school para hindi na ako mag-uuwi ng gawain sa bahay...”* Sir Ron said. With proper schedule of activities, teachers were able to identify which task needed to be prioritized first. If a teacher utilizes his/her time well, accomplishing all tasks in preparation, distribution, and retrieval and assessment will be achieved easily.

**Stay positive.** According to the respondents, being positive and believing that everything will be accomplished as planned lessens their burdens, frustrations, pressures, worries, and stress. The respondents claimed that having a positive outlook and having faith that things would go as planned helps them feel less burdened, frustrated, pressured, worried, and stressed.

*“Think positive lang basta wag sa Covid ha, I mean kahit nakakastress sa dami ng reports eh isipin na lang natin na maswerte pa din tayo kasi nakapasok na tayo sa public, ang hirap kaya makain...”* Ana

*“Naniniwala ako sa sinasabi na “What the mind conceive, the body can achieve.” Magtiwala lang na lahat ng pagsubok na pinagdadaan ay lilipas at malalampasan din. Stay positive dapat and always be happy para hindi tayo mabilis tumanda...”* Fe

Positive thinking helps novice teachers maintain a calm perspective despite the difficulties and challenges caused by the changes in educational setting.

**Ask for advice/guidance.** By seeking advice, assistance or direction from a mentor or other experienced teachers, novice teachers were able to overcome the challenges in modular distance learning modality. Being open and willing to accept constructive criticisms also helps them perform better.

*“Nagtatanong ako sa mga coteachers ko kapag may hindi ako alam or maintindihan...”* Jenny *“Nanghihingi ako ng advice sa mga datihan ng teachers lalo na sa mga naging teachers ko din noon na coteachers ko na din ngayon kapag hindi ako sigurado sa gagawin ko...”* Gel

Aside from the challenges in modular distance learning modality, novice teachers also face high expectations and pressure from other colleagues since they are being expected to have fresh and new ideas. To ease their mind from the stress brought by pressure, novice teachers equip themselves by attending webinars and trainings and even asking help from experienced teachers.

## Challenges and Coping Strategies of Novice Teachers in Modular Distance Learning Modality

*“Embrace and accept changes, Teacher tayo eh. Kahit saan tayo ilagay makakasurvive tayo. Para sa bata, para sa bayan...” Ron*

Additionally, by being flexible and knowing how to adapt to the changes in the educational system brought by the pandemic, they are also able to overcome the challenges encountered in the implementation of modular distance learning modality.

### CONCLUSIONS

Based from the findings, the following conclusions were derived:

1. Novice teachers' challenges in modular distance learning modality are lack of printing materials, and supplies, time consuming, power interruption, parents not getting the modules, schedule not being followed, late submission, unanswered/unfinished modules, and unidentified answer sheets, dirty, damaged modules with torn and missing pages, academic dishonesty and difficulty validating learners' performance.
2. Proper time management, staying positive and asking advice or guidance from a mentor are the strategies employed by novice teachers in order to cope up with the challenges in modular distance learning modality. In addition being flexible and knowing how to adapt to changes help them cope up with the challenges encountered.

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## Maternal Knowledge and Practice of Exclusive Breastfeeding in a Secondary Health Facility in Southern Nigeria



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### ABSTRACT

**Introduction:** In Nigeria particularly, many changes in infant feeding practices have occurred over time due to the introduction of alien cultures and the effects of urbanization.<sup>10</sup> This is of grave concern, because of the net advantage of exclusive breastfeeding in reducing childhood morbidity and mortality.

**Methodology:** This was a cross sectional descriptive study conducted amongst mothers attending antenatal clinic in a secondary health facility in Benin City Nigeria. Maternal knowledge and practice of exclusive breastfeeding was assessed using structured pretested questionnaires. A total of 200 mothers were selected using simple random sampling.

**Results:** Majority of the mothers were between the age group of 30- 39years, and had tertiary education(45.5%, and 56% respectively). Majority ( 179 ;89.5%) of respondents were aware of Exclusive Breastfeeding out of which 160 (89.4%) knew the correct definition of exclusive breastfeeding. Overall, good and poor knowledge of exclusive breastfeeding among respondents was 80.0% and 20.0% respectively.

**Conclusion:** This study showed that despite the high proportion of mothers with good knowledge of exclusive breastfeeding, the percentage of mothers practicing exclusive breastfeeding was not so high.

### INTRODUCTION

Breastfeeding is the process by which nutrition is provided to a child by putting the mother's (or surrogate's) nipple into the mouth of the child.<sup>1</sup>

It is an integral part of the reproductive process of the mother, with far reaching implications for her health as well as the health of her baby.<sup>2</sup>

Its advantages for the mother includes: prevention of ovarian and breast cancer, child spacing, optimal mother to child bonding as well as reduced feeding cost.<sup>2</sup> For the infant, it is considered a rich source of immunoglobulins which are protective against early childhood diseases. Other advantages include: reduce incidences of allergies , necrotizing enterocolitis and obesity, improved neuro-cognitive development amongst others.<sup>3-5</sup>

Breastfeeding is thus very essential for optimal growth and wellness of a child and should ideally be commenced within 30minutes of birth for vaginal deliveries and 4hours of birth for caesarian deliveries.<sup>6</sup>

Exclusive breastfeeding is the practice of feeding an infant for the first six months of life on breastmilk only with the strict exclusion of water or any other kind of food.<sup>7</sup> Research has shown that exclusively breastfed infants are far less likely to die from diarrhea and pneumonia than their counterparts who have not been exclusively breastfed.<sup>8</sup>

Globally, there has been a decline in exclusive breastfeeding rate, amongst nursing mothers particularly in developing countries.<sup>9</sup> In Nigeria particularly, many changes in infant feeding practices have occurred over time due to the introduction of alien cultures and the effects of urbanization.<sup>10</sup> This is of grave concern, because of the net advantage of exclusive breastfeeding in reducing childhood morbidity and mortality.

Studies in Enugu has revealed an exclusive breastfeeding rate of 33.4%, while in Ibadan, rates as low as 23.4% have been reported.<sup>11-12</sup>

Breastfeeding is both a natural act and a learned behavior .<sup>10</sup> Factors like socio-economic and health status of mother, mother's occupation as well as cultural beliefs affect breastfeeding.<sup>13-14</sup> Knowledge of mother concerning breastfeeding would influence their practice of exclusive breastfeeding.<sup>10</sup>

## Maternal Knowledge and Practice of Exclusive Breastfeeding in a Secondary Health Facility in Southern Nigeria

This study therefore seeks to assess maternal knowledge as well as exclusive breastfeeding rate in a secondary health facility in Southern Nigeria.

### METHODOLOGY

This was a cross-sectional study conducted between December 2021 and June 2022 amongst pregnant women attending antenatal clinic in Central Hospital Benin City.

The Hospital is located around Sapele road area of Benin City and primary offers secondary care to residents of Oredo community in Benin City.

Structured research administered questionnaire was used to obtain information from the pregnant women. Information obtained included biodata as well as other relevant information to assess their knowledge and practice of exclusive breastfeeding amongst these mothers attending antenatal clinic. A total of 200 mothers attending antenatal clinic was selected using simple random sampling.

Data collected were entered into a table and analyzed using the statistical package for the social sciences (SPSS version 20). Socio-economic status of the participants was determined using oyedeji's classification.<sup>14</sup> For all statistical tests, p-values<0.005 were considered significant.

### RESULTS

Table 1. Sociodemographic Characteristics Of Respondents

Variable	Frequency (n = 200)	Percent
<b>Age group (years)</b>		
< 30	63	31.5
30 – 39	91	45.5
40 – 49	36	18.0
50 and above	10	5.0
<b>Mean ± SD</b>	<b>34.0 ± 7.8 years</b>	
<b>Level of education</b>		
Primary	16	8.0
Secondary	72	36.0
Tertiary	112	56.0
<b>Occupational Skill Level</b>		
Skill Level 0	21	10.5
Skill Level 1	15	7.5
Skill Level 2	116	58.0
Skill Level 3	37	18.5
Skill Level 4	4	11.5
<b>Number of children</b>		
< 3	106	53.0
3 – 5	86	43.0
> 5	8	4.0

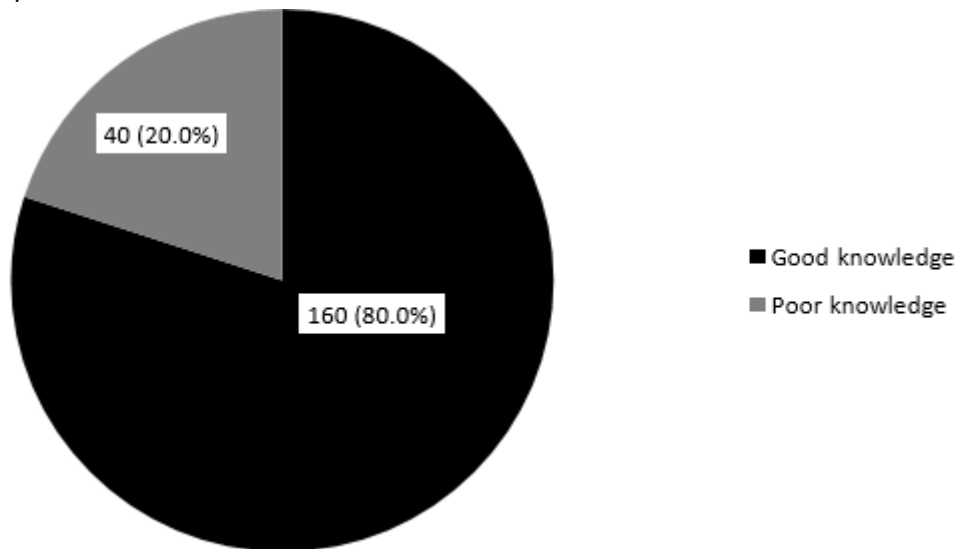
Respondents within age group 30 – 39 years accounted for nearly half (91 ;45.5%) of the participants. The mean age was 34.0 ± 7.8 years. More than half (112 ;56.0% and 116 ;58.0%) of the respondents had tertiary level of education and occupation within skill level 2 respectively. Likewise, 106 (53.0%) of respondents had less than 3 children, while 86 (43.0%) had between 3 – 5 children.

# Maternal Knowledge and Practice of Exclusive Breastfeeding in a Secondary Health Facility in Southern Nigeria

**Table 2. Knowledge Of Exclusive Breastfeeding Among Respondents**

Variable	Frequency (n = 200)	Percent
<b>Awareness</b>		
Yes	179	89.5
No	21	10.5
<b>Definition of EBF (n = 179)</b>		
Correct	160	89.4
Wrong	19	10.6
<b>Overall knowledge</b>		
Good knowledge	160	80.0
Poor knowledge	40	20.0

Majority ( 179 ;89.5%) of respondents were aware of Exclusive Breastfeeding out of which 160 (89.4%) knew the correct definition of exclusive breastfeeding. Overall, good and poor knowledge of exclusive breastfeeding among respondents was 160 (80.0%) and 40 (20.0%) respectively.



**Figure 1: Overall Knowledge Of Exclusive Breastfeeding Among Respondents.**

Majority ( 160 ;80.0%) of respondents had good knowledge of exclusive breastfeeding.

**Table 3: Association Between Knowledge Of Exclusive Breastfeeding And Socio-Demographic Charcteristics Of Respondents**

Variable	Overall knowledge		Test statistics	p-value
	Good knowledge (n = 160) Frequency (%)	Poor knowledge (n = 40) Frequency (%)		
<b>Age group (years)</b>				
< 30	48 (30.0)	15 (37.5)	$\chi^2 = 0.911$	0.823
30 – 39	75 (46.9)	16 (40.0)		
40 – 49	29 (18.1)	7 (17.5)		
50 and above	9 (5.0)	2 (5.0)		
<b>Level of education</b>				
Primary	10 (6.3)	6 (15.0)	$\chi^2 = 16.735$	< 0.001
Secondary	49 (30.6)	23 (57.5)		
Tertiary	101 (63.1)	11 (27.5)		

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### Occupational Skill Level

Skill Level 0	15 (9.3)	6 (15.0)		
Skill Level 1	11 (6.9)	4 (10.0)		
Skill Level 2	91 (56.9)	25 (62.5)		
Skill Level 3	32 (20.0)	5 (12.5)		
Skill Level 4	11 (6.9)	0 (0.0)	Fischer's Exact	= 0.244
			5.278	

### Number of children

< 3	91 (56.9)	15 (37.5)		
3 – 5	64 (40.0)	22 (55.0)		
> 5	5 (3.1)	3 (7.5)	$\chi^2 = 5.472$	0.065

The highest proportion (75 ;46.9%) and 16 (40.0%) of respondents with good and poor knowledge respectively were within age group 30 – 39 years ( $p = 0.823$ ). Similarly, those with occupation in skill level 2 had the greatest proportions ( 91 ;56.9%) and 25 (62.5%) of good and poor knowledge respectively ( $p = 0.244$ ).

There was a decline in the proportion of respondents who had good knowledge of exclusive breastfeeding with increasing number of children with those who had less than 3 children accounting for the greatest proportion (91 ;56.9%) of respondents with good knowledge ( $p = 0.065$ )

The proportion of respondents with good knowledge increased with increasing level of education as respondents who had primary and tertiary levels of education accounted for the lowest (10 ;6.3%) and highest (101 ;63.1%) proportions of good and poor knowledge respectively. This association between knowledge of exclusive breastfeeding and level of education was statistically significant ( $p < 0.001$ )

**Table 4: Logistic Regression Model For The Determinants Of Knowledge Of Exclusive Breastfeeding**

Predictors	B (regression co-efficient)	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
<b>Age</b>	-0.021	0.980	0.927	1.035	0.466
<b>Level of education</b>					
Tertiary	1.462	4.314	1.226	15.180	<b>0.023</b>
Secondary	0.099	1.104	0.349	3.487	0.867
Primary*	1				
<b>Occupational skill level</b>	0.336	1.400	0.914	2.145	0.867
<b>Number of children</b>	-0.042	0.959	0.712	1.291	0.078

### \*Reference category, $R^2 = 9.4\% - 14.9\%$ , CI= Confidence Interval

The variable in the model accounted for between 9.4% – 14.9% of the variation observed in the outcome variable (Good knowledge). With increasing age, the likelihood of having good knowledge decreased by 0.021. This was more likely by an odds ratio of 0.980 when compared with respondents with poor knowledge ( $p = 0.466$ ). Similarly, with increasing number of children, the likelihood of having good knowledge decreased by 0.042. This was also not statistically significant ( $p = 0.078$ ).

Conversely, the likelihood of having good knowledge was found to increase significantly with increasing level of education as those with tertiary level of education were 4.314 times more likely to have good knowledge compared to those with primary level of education ( $p = 0.023$  CI = 1.226 – 15.180).

Respondents with higher occupational skill levels were 1.400 times more likely to have good knowledge of exclusive breastfeeding. This was however not statistically significant ( $p = 0.086$ ).

## DISCUSSION

This research study surveyed a total of 200 pregnant mothers attending antenatal clinic in Edo state, Nigeria. The study assessed the knowledge and practices of mothers. About half (45.5%) of the respondents were of the age group 30-39 with a mean age and

## Maternal Knowledge and Practice of Exclusive Breastfeeding in a Secondary Health Facility in Southern Nigeria

SD of 34=7.8 years. This is far less than findings from a study done in Osun, Nigeria,<sup>10</sup> where 90.25% of the respondents were within the age range of 20 and 39 years with a mean age of 26 years. This could be as a result of the fact that this study was done in an urban settlement compared to the Osun study that was done in the local government areas. It also shows that most of the mothers were within the reproductive age of 15- 49 years and the chances of under-five morbidities due to maternal age is reduced

This study recorded that majority of the mothers were aware of EBF(89.5%) which is in tandem with findings from a study done in Ethiopia where it was reported that 83.4% of mothers were knowledgeable about the recommended duration of EBF but less than the findings that was reported in Lagos Nigeria where all the respondent(100%) were aware of EBF.<sup>15,16</sup> These findings contrast with that found in a study carried out in Nigeria where 64.6% of respondents had knowledge that EBF should continue until 6 months. It is expected that a higher percentage of the respondents should have a much higher percentage of knowledge with respect to the correct period for EBF as demonstrated by this study based on the level of education recorded in this study. The difference in level of knowledge in both studies could be due to rigorous health education during antenatal visitation, literacy levels of the respondent, cultural influence and roles husbands play in child upbringing, which helps to continuously emphasize the need for and importance of EBF.

Majority of the mother 89.4% correctly defined what EBF with overall knowledge score of 80% found in the amongst 30 -39 years age group. This is however lower than the 94 % of respondents who had good knowledge of EBF that was reported among female bank workers in Lagos Nigeria in 2018<sup>10</sup>. Although they recorded a high level of knowledge in this study it is however not known if the commenced it within the first 30 mins of birth of the child as stipulated by WHO recommended guideline of introduction of breastfeeding within the first few hours of life is very crucial to the development and growth of the children.<sup>17</sup> The high level of knowledge of EBF could be as a result of other factors such as sociocultural factors, educational status and geographical location where the research was carried out. The slight difference in the level of knowledge could be as a result of the social class amongst the respondents in the Lagos study.<sup>16</sup>

More than half of the mothers practiced EBF 69% in this study which is more than findings recorded in some studies carried out in Ghana and Sokoto state, Nigeria which has 47%<sup>18</sup>, 27.7%<sup>19</sup> and 22.9%<sup>20</sup> respectively but less than the 75.6% of mothers reported to have practiced EBF in the study done in Lagos, Nigeria.<sup>10</sup> It is of note that these findings are far below the WHO recommendation of 90%.<sup>21</sup> These shows a huge gap between the desired and the actual practice of EBF in the study area. The low practices of EBF and high level of knowledge in this study area could be due to reasons that most mothers did not get information regarding EBF from their health providers during health education session in the hospitals, hence, majority of the mothers had knowledge on EBF but did not practice it because most mothers are working class and educated mothers as recorded by the high tertiary level of education in this study and might not be able to create time for breastfeeding at work if they don't have a creche close by and not totally compliant with EBF. It might also be that do not want to spoil their shape by breastfeeding and prefer the stress-free formula feeds. This indicates that healthcare personnel who care for mothers should increase their efforts to promote EBF and need for public policies which that ensure the living and working conditions of women are compatible with exclusive breastfeeding.

Busy schedule, poor understanding/ignorance and poor lactation were some of the reasons given by majority of respondents who failed to practice EBF in this study, this is however not the case in other similar studies who reported low family support, and living with a partner, having two or more breastfeeding role models, lack of Hospital support for breastfeeding and Maternal age was also a significant factor in reasons cited by women for not breastfeeding.<sup>22</sup> Employed mothers have a lower opportunity to stay at home, compromising exclusive breastfeeding. Mothers also may have to leave their babies to search for a job. It was found that only 43% of employed mothers breastfed their child for six months, whereas the unemployed figure is 56%, which is 13% more than the employed figure. Most organizations in Nigeria either have no breastfeeding supporting policies or designated facilities for nursing mothers to breastfeed their babies while at work.<sup>24</sup> This is in variance with the WHO recommendation and National Policy on infants and young child feeding in Nigeria. Thus, there is a need for improved family and work-based breastfeeding support for nursing mothers to enable them to practice EBF.

## CONCLUSION

This study found that despite there was a considerable variance between the proportion of women who knew about exclusive breastfeeding and those who actually practice it. More needs to be done to bridge this apparent gap between the knowledge and the practice of exclusive breastfeeding amongst antenatal mothers.

## ACKNOWLEDGEMENT

The authors are grateful to Onyebuchi Abolo helping with the data collection.

Source of funding: none.

Conflict of interest: none

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## Golden Life Lessons and Challenges of Retirees: A Case Study



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**ABSTRACT:** This study investigated the lived experiences of the of retirees who are members of the federation of senior citizens from Talugtug Nueva Ecija. A qualitative method and case study research design was used in investigating and narrating the golden life lessons and challenges of the retirees. The research used purposive sampling, Qualitative data was thematically coded and analyzed through content narrative analysis. The findings of the study revealed that the common golden life lessons of the retirees are; to be a good father/mother, be contented and validate marriage and to work hard or to be diligent and patient when it comes to education. While the challenges encountered by the retirees are the poverty they experienced which is the main reason for their hard work in life along with their desires or preferences, tasted hurtful words and were judged by the wrong view from their spouse's family. Also, retirees went through intense trials and sacrifices before achieving success in the educational aspect. They used their past experiences to shape their daily life experiences in ways that enhanced their own well-being and quality of family.

**KEYWORDS:** Golden Life Lessons, challenges, retirees.

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### INTRODUCTION

"*Papunta ka pa lang pabalik na ako*". A familiar Filipino saying that can be heard from your grandparents may have already told you. There are many experiences and trials in a person's life as they get older. An example of this is the lessons learned from them because the elders are abundant and wealthy in their experiences. In the unforgivable stories of their experiences, they live them and serve as a good motivation to teach children and grandchildren.

Growing old is not easy and involves various life changes which demand multiple adjustments requiring stamina, ability, and flexibility. Old age is one of the major transitions in life. It has many consequences on different aspects of life such as financial situation, the allocation of time, social relations, as well as physical and mental health. These changes are likely to affect individual well-being in various ways.

In the Philippines, according to different researches, the number of elders will increase by the year the 2050s; while international studies focused on the payment of retirement benefits (pension and gratuity) and other similar studies. Also, there is a lack of properly instituted studies when it comes to geriatric counseling in the Philippines.

Retirement has been described from a variety of economic, commercial, social, and health standpoints. Retirement is defined as an event, a process, and a function (Reis & Gold, 1993, as quoted in Aldiabat et al., 2021). It is an unavoidable stage of human existence that can occur before or after the age of 65. Shwartz (2004) examines the idea of retiring from two angles. To begin with, retirement is a period of transition between adulthood and the early stages of aging, distinguished not only by a shift in age but also by shifts in roles, relationships, self-image, and interests particularly in the family aspect. Second, retirement is "a long-term process that begins prior to the cessation of gainful employment and ends afterward."

Thus, this study narrated and investigated the remarkable life stories of Retirees in Talugtug Nueva Ecija. As lived experiences considered the golden life lessons, as well as their challenges encountered in terms of family, Marriage, and education. Furthermore, the researcher embedded to contribute an additional literature about the lived experiences of the retirees in the Philippines.

### Theoretical Model

To understand the golden life lesson and challenges of the retirees the study used *Pagdadala* model of Decenceteo (1999). *Pagdadala* (burden bearing) is use as a model for viewing the life experiences of the Filipino and used as well as a way to help in difficult times. The *Pagdadala* model was applied in such a way that *nagdadala* are the retirees, which pertains to identify



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geriatrics while the *dinadala* which refers to the experiences and challenges will dig deep into the participants' experiences and challenges that they face as a geriatrics. Meanwhile, the *kapwa nagdadala* refer to the support they get looked into the support they received from their families, friends, spouse and community. Lastly, the *patutunguhan* pertains to their goals in life if they have already fulfilled their dreams and purpose in life. The researcher looked at the experiences of the participants in the lens of the *pagdadala* model and can anchored it in the designed program for the needs of the participants.

### METHODS

#### Design

According to Wilson (2010), qualitative research is a research that attempts not only to understand the world, but also to understand it through the eyes of participants whose world it is. It uses a naturalistic approach that seeks to understand phenomena in context-specific settings, such as real-world settings where the researcher does not attempt to manipulate the phenomenon of interest (Patton, 2002).

Case study is the preferred strategy when 'how' and 'why' questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context (Yin, 2003). Yin further defined case study research method as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Yin, 1984).

#### Participants

The participants of this study are (6) six retirees from Talugtug Nueva Ecija. They are selected using the following criteria: (1) at least two (2) years from the date of their retirement (2) member of the federation of senior citizens and (3) 60-75 years old. The research used pseudonyms to each participant to protect their identification and to observed confidentiality

#### Data collection

To generate the needed data for the study, the researcher used the enough time to have "*pakikipagpalagayang loob*" to the participants through storytelling. In this way, the researcher grasped well the participants and gave the consent form to their family members. In narrating their life stories, the participants are encouraged to used Filipino/Tagalog language so that they could fully expressed themselves and their experiences. In this manner, the researcher could extract the essential information about the phenomenon under investigation without putting the participants in a situation where they would feel uncomfortable to speak. The researcher used the self-made guide questions for semi-structured interview validated by three (3) register guidance counselor to avoid questions that are not related in the objectives of the study.

#### Data analysis

Thematic Analysis Technique. Braun and Clarke (2006) defined thematic analysis as a method for identifying, analyzing and reporting patterns within data. Thematic Analysis is a widely used foundational method of analysis in qualitative research. They highlighted step-by-step guidelines for using the thematic analysis which the researcher followed in his own analysis of the data which includes 1. *Familiarizing with the data* 2. *Generate initial code* 3. *Searching for themes* 4. *Reviewing themes* 5. *Defining and naming themes* 6. *Writing the Report*

### FINDINGS

#### Case Presentation

**Case 1. Ginoong Pedro** is a former Brgy. captain and businessman in Barangay Magsaysay Talugtug Nueva Ecija. He is from Zamboanga City and he only married a native Talugtug woman and lived here. He is currently sixty -seven years old, physically fit and well -off.

#### Golden Life Lessons

**Family (Be a Good Father).** Ginoong Pedro's Golden Life lesson in his family is to be a good father, because he believes that teaching children begins at home, where the primary parent would perform the role. He claimed that he instilled in his children good manners such as respect for the elderly while they were small. He said "*Pag na train mo yung anak mo, pag na training mo sa bahay, dadalhin nila sa eskwelahan yon, additional na lang yung nasa school, pag uwi nila ikaw pa rin ang magulang, ikaw pa rin ang magtuturo sa kanila, ikaw rin, kaya sa tahanan nagmumula yung edukasyon*".

**Marriage.** When each partner demonstrates goodwill and a desire to work together, overcoming disagreement in marriage is considerably easier. According to Ginoong Pedro, "*Mahalagang aral sa pag-aasawa eh kapag may away kailangan talaga pinag-uusapan sa tamang oras at panahon, dapat rin marunong makinig*". when you try to force answers from others, problems develop.

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When you take the time to listen and allow everyone to speak about their wants or what matters most to them, the likelihood of a relationship's unity and solutions increases dramatically.

**Education (Education is Important).** *“Edukasyon ang susi sa kahirapan”* This is what Ginoong Pedro remarked about the golden life lessons he learned during his education. Ginoong Pedro did not complete his college education, but he believes that it is critical to do so. According to his statement, he chose to work before finishing his education because he disliked the experiences he had in the course he was given. *“baka hindi nila makayanan yun ginagawa ko, so para makasiguroako na gumanda yung buhay nila, sa edukasyon sila, kailangan makatapos, para kung hindi man sila swertehin sa negosyo atleast propesyunal sila”.* Naniniwala Si Ginoong Pedro na ang edukasyon lamang ang tanging maipapamana niya sa kanyang mga anak na kahit ninuman ay hindi mananakaw. *“Ang number 1 talaga ay mag-aral, mag-aral kasi kung hindi ka mag-aaral, hindi ka makakatapos mahihirapan ka”.*

### Challenges

**Family.** Work hard (Be diligent and patient). – *“kapag ikaw ay mahirap, mababa ang magiging pagtingin sayo ng ibang tao”.* Ginoong Pedro said this when he related the account of his life leading up to his marriage. Ginoong Pedro was raised nicely in Zamboanga City by his parents. He dropped out of school because he disliked the course he was taking at that time. Until he opted to work in their area as a construction worker.

**Marriage.** In every marriage, there will always be a challenge, Ginoong Pedro, felt that his wife was spending lot of money for her mother and brother. *“Siguro ung challenge sa aming mag asawa eh yung tungkol sa pera, dahil din sa pamilya ng asawa ko madalas siya magbigay ng pera sa pamilya niya eh”* He was very firm but expectedly his wife still give money to her family as she wanted to help them with all their expenditure. Unable to tolerate her behaviour and cope up with situation Ginoong Pedro opened up the issue with one of his friends. He suggested him to talked to Maria in a nice way to understand their situation.

**Education.** Pagtulong Sa Kapwa (Pagtulong sa nangangailangan). *“Para ma-bless ka, i-share mo yung blessings mo. I-share mo yung blessings mo kahit kaaway mo, basta ganun, yung bukal sa puso mo at challenge yun sa atin”.* If you put into the reality of what you have learned in school together with your life experience it will be worth it in helping other people. Giving freely to serve others is vital to Ginoong Pedro (whether it is financial or moral support).

**Case 2. Ginang Lily** Currently 68 years old and a former elementary school teacher in their community. Ginang Lily was the eldest of her siblings, thus she was aware of poverty from an early age. Ginang Lily's parents' main occupation is selling vegetables in the market; therefore, she is always assigned to look after her four siblings. She currently has two children who are both doctors and living in America and Canada with their different families.

### Golden Life Lessons

**Family. (Guidance to your Children)** When it comes to family, Ginang Lily's golden life lesson is to provide enough instruction so that the children do not seek for another individual to lead them down the incorrect path. What happened to Ginang Lily's eldest son JM served as a lesson for her, based on her experiences. If she could go back in time and do it all over again, she would never do it to her son. *“So yun ay isang pinakamalaking pagkakamali ko na kung pwedeng kong balikan, eh hindi ko gagawin”.*

**Marriage.** Marriage is like a roller coaster ride, an adequate transparency when helping couples in discussing a concern so that marriage partners can understand one another. On the other hand, inappropriate revelation can offend, accuse, or hurt someone. Ginang Lily stated *“para sakin, hindi totoo yung sinasabi ng iba na wag kayong matutulog ng may galit sa isa’t-isa mas Mabuti yung ahhhh... matulog muna kayo at palamigin ang ulo ng isa’-isa, then saka na kayo mag-usap pag parehas na kayong hindi galit”.*

**Education (Have ambition in life).** Ginang Lily can say that her education has helped her achieve her goals in life. Because it was her inspiration to keep going despite the difficulties he was facing. According to her narrative, he was always left in their home as a child since he was responsible for her four younger siblings while her parents looked for work. When her parents were away, she became conscious of domestic responsibilities and was also the one who always ran away from her brothers.

*“Talagang bata pa lang ako, yun ang naging ambisyon ko. Ambisyon ko talagang makapag-aral ako, makayari. Tsaka nakikita ko yung mga tapos na teacher ganun basta propesyunal sila, magaganda ang tingin ko sa kanila”.*

### Challenges

**Family. Family (Be diligent and patient).** In Ginang Lily's desire to achieve her ambition in life, she worked hard and persevered to achieve it. One challenges at the same time a lesson that Ginang Lily can take from her life experiences is that she became a hardworking and patient person for her Family. Se added that she also had the experience of going out in Manila to deliver vegetable products to Divisoria with her parents. She said. *“bata akong pinakinabangan ng mga magulang ko, batang bata”.* Not only selling bokayo she does. Ginang Lily s also experienced to wash her neighbors' clothes in addition to her school expenses.

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**Marriage. (Set aside your own pride when you have a family).** Ginang Lily's important golden life lesson in the marriage aspect is that she believes that having no other companion is beneficial to a family because disagreements over social topics are unavoidable. *"ang point ko dun magiging magulo kayo, may mangengelam eh, may papakisamahan ka."* Ginang Lily's point is that after you are married, you should have your own home to live so that you don't have any more arguments. *"dapat once na nag-asawa ka, naka-separate ka"*. It is crucial because it is also stated in the Bible. And pagbukod ng sariling tahanan ay mahalaga dahil ito ay nakasulat sa bibliya. And, most significantly, her parents should encourage her to practice. *Mayroon kasing mga magulang kahit na may asawa na yung anak, gusto dikit dikit pa din sila. That is not tama. Hindi tama bakit? Nakalagay na nga sa bible eh, iiwan mo eka yung mga magulang mo at kayong dalawa ay magsasama parang isang laman.*

**Education. Education is Important.** Ginang Lily's third major Golden Life lesson was that she did not give up despite the difficulties she faced in achieving her goals. She claimed that she did not squander the opportunity to study hard when he had it. She placed a high emphasis on his education since he believed it was the only way to keep them out of trouble. *"para kasing nasa isip ko nun, paano ba kaming aasenso kung hindi ako makakapagtapos?"*

**Case 3. Ginoong Baldo** is an Ilocos Sur native who now resides in Brgy. Cabiangan, Talugtug Nueva Ecija, He was the eldest of seven siblings and was orphaned as a child. He got the experience working several jobs to help his father earn a living when he was only eight years old.

### Golden Life Lessons

**Family.(Be a good father).** *"Kahit sino ka man kung walang kwenta ang mga anak mo, you're a failure"* When it comes to his Golden Life Lesson in terms of Family, Ginoong Baldo mentioned this. He feels that if you do not become a decent father, all of your previous jobs will be worthless. According to him, the most important component of all golden life lessons is his parenting of his children, which includes correct education, spiritual, physical, and other aspects. As a father, he first ensured that he was capable of fulfilling his obligations to his children.

**Marriage.** Their love for each other were blessed with seven children. However, his wife died early because of diabetes. For the second time, Ginoong Baldo fell in love and met his second wife who was also a widow. *"Ang pagmamahal may second chance yan. Nung namatay yung una kong asawa akala ko hindi na ako mag-aasawa ulit kasi mahal na mahal ko yung una kong asawa, pero dahil sa nangyari, natutunan ko na pwede parin pala mag asawa, masarap magmamahal lalo kung totoo yung pagmamahal.*

**Education.** Ginoong Baldo learned to value education because of his father. What his father had told him before, opened his mind to continue his education. *"that was the best advice. He opened up my mind that the education is the best equalizer"*. He had imprinted on his mind then that he could finish his education and fulfill his father's goals so that he could better help his brothers and sisters. *So, I brought up myself that I must see to it that I will raise the members of my family like what I have promised to my late father. So, my conscience brought myself that I have to get [the] best education"*.

### Challenges

**Family.** With the success of Ginoong Baldo, he became attached to adventure being self-diligent. Ginoong Baldo worked hard because his first wife's family looked down on him as a low and worthless person. According to his story, They allegedly chased him away and even said hurtful words. He said he did not want to be forced to take Ginang AS because he would definitely not be able to finish his studies then. *"pag ninakaw ko yung anak nila sa kanila, sigurado, I can't finish my studies"*.

**Marriage.** Ginang AS (first wife) wanted to meet his parents before marrying her, according to his narrative. *"Magtanan nalang tayo"*. Ginang As's (first wife) parents were known to be a wealthy and powerful family, so Ginoong Baldo did not say anything and fought. He stated that he did not want to be forced to take Ginang As because he would be unable to complete his studies at that time.

**Education.** Ginoong Baldo believes it is important to an efficient and good leader. He said that his uncle inspired him to be a good leader. As he observed his uncle, he learned the strengths and weaknesses of people based on what they did. One of the observed and learned lessons of Ginoong Baldo is to be diligent at school and work. He said *"nararapat na ibuhos ang lahat ng iyong makakaya sa pag-aaral at sa trabaho upang makuha mo ang iyong gusto"*.

**Case 4. Ginang Agnes** Born in Brgy. Nangabulan, Talugtug Nueva Ecija was the fourth participant. She is the fourth among her five siblings and she is currently sixty-six years old. She was already old when she entered into marriage. She was able to marry a widowed man but they were no longer blessed by a child probably also due to her age and physical ability.

### Golden Life Lessons

**Family. (Be grateful).** Ginang Agnes believes in the saying that the person who does not know how to look back to the origin will not reach the destination. She said that being grateful to others most especially to your family is a great blessing from God, because it is here that she remembers all the hard works she had been experienced. *"Ang number one na lilingunin mo dapat ay"*

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*yung mga magulang mo. Naniniwala ako na ang isang tao ay hindi siya magiging successful kung pabaya siyang anak, kung hindi niya lilingunin at kakalingain yung mga magulang niya. Kasi after all, sila yung tumulong sayo eh sila ang pinagkaka-utangan mo ng buhay. Kung hindi mo sila tutulungan eh sinong tutulungan mo?*

**Marriage.** Ginang Agnes was already old when she entered into marriage. She was able to marry a widowed man but they were no longer blessed by a child probably also due to her age and physical ability. *“Ang aral sa pag-aasawa para sa akin, ay parehong maganda at hindi maganda eh, Maganda na take your time wag magmadali kasi ang pag aasawa hindi naman parang kanin na pag napaso ka iluluwa mo na, kailangan kilalanin niyo ang isa’t-isa. Yung hindi naman maganda eh pag late ka na nag asawa malaki yung chance na di na kayo magkakaroon ng anak”.* When it comes to marriage, Ginang Agnes golden life lessons are both positive and negative. For her, it’s important to get to know the person you want to marry first; marriage is a lifelong commitment; nevertheless, the bad lesson is that if you married in your forties, you may not able to carry a child owing to physical limitations.

**Education.** *“Mahalaga ang pag aaral sobrang halaga”* She said, Education is really important and it matters the most, she also thanked the people who supported her when she was still suffering from studying. She said that she wanted to give value to the people who gave or delivered help to her especially during difficult times in their lives. Ginang Agnes is very grateful nothing can match it how she valued the help they have given because she knows they are good people. She thanked God that she had paid off their debts when she was able to work. She said not to be stingy, share what you have because she believes that it has a good reward for you.

### Challenges

**Family. (Work hard, persevere, for your Family).** An early age and while she was studying then, she learned how to be smart in the reality of life. When Ginang Agnes was still in elementary school, she experienced farm work to support her education. She told the story that during the hardships of their lives then, she was proud to say that she dreamed. She made their state in life motivation to dream. For her, it is important that a person has a dream so as not to suffer in the future. *“dapat mayroon ka nang pangarap na gustong marating kasi yun ang pagsusumikapin mong marating eh”* she said.

**Marriage. (Save money).** Ginang Agnes's unique lessons is to save on your own especially when you got married. Because of the hardships of their lives back then, she could not avoid having financial problems. *“kapag ka maliit ang kumot mag-aral kang mamaluktot, saka mas mahirap na yung habang nag aaral ka, tapos may asawa ka pa kailangan mo mag budget para sa pamilya.”.* Ginang Agnes endured and persevered in this situation because she knew then that it had its limits.

**Education.** Ginang Agnes was motivated by their state of living then so, she could work hard. she believes that poverty is not a barrier to being successful in life. Rather, it is a motivation for a person to persevere despite adversity. For her, there are many ways to overcome adversity. One of these is to study hard. According to her, her parents told her that they could not afford her education because her parents did not earn enough money to make a living. Ginang Agnes did not believe this so she showed to her parents her unique ability. They had a different view in those days because people believed that a woman would only marry early. *“Kung hindi kami magaling hindi kami pag-aaralin dahil nung araw sasabihin mag-aasawa lang yan eh”,* she said.

**Case 5. Ginoong Dodoy,** growing up in small town of Talugtog, Nueva Ecija. He grew up without his father because he was only three years old when his parents separated and his father had the second family.

### Golden Life Lessons

**Family. (Be a good father).** Growing up with Ginoong Dodoy who was not guided by his own father in growing up, this did not stop him from being a good father to his children. He said that with the increasing number of his life experiences, he happily shares his stories with his children. This is one of his motivations to the children as he gives sermons. He is able to show them proper guidance such as giving advice to his children. He said that before he gave them advice, he first made sure that he did it himself so that he could feel that the children were listening to him. Just like he exhorted them to study hard and try to finish school. *“sabi ko sa kanila, ako nakatapos kahit sa maliit ng eskwelahan na walang pera, nakaya ko, dapat ganyan din kayo”.* *Sapagkat, naniniwala si Ginoong Dodoy na kapag hindi nakapagtapos ng pag-aaral ang mga anak ay maaaring mahirapan ang mga ito sa buhay “kapag hindi mo pinag-aral yung mga anak mo, para mo silang pinadala sa gera na walang uniporme, walang baril. Paanong magsusurvive yun?”*

**Marriage. (Be strong in the marital relationship).** Ginoong Dodoy's lessons is to be strong in the marital relationship. In the hardships he has gone through in his life, one of his important allies here is his wife. He said that it is not easy for the couple to have quarrels or misunderstandings. Like other couples, they are also not perfect in their relationship because misunderstandings over things and circumstances are unavoidable. He stated that sometimes it comes to the point that he commits sin against his wife. But, he does not let their relationship break down immediately because he loves his wife so

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much. *“Dumarating kasi sa parte ng buhay ng lalaki yung minsan nambababae, umiinum. Dapat yun paglabanan mo, kaya nga may mga naghihiwalay na mag-asawa eh hindi mapaglabanan”.*

**Education.** Ginoong Dodoy's important lessons is to graduate. He was not born rich so he worked hard to finish his education. It was difficult and impossible for him to finish school, because their life was difficult then. But he made it possible with the help of his mother and siblings. He said that when he was still in school, not everything was easy. He experienced that he had nothing to wear to school and that he did not have a sensible uniform. Ginoong Dodoy was emotional as he shared his past experiences when it comes to his journey pursuing his dreams in life. He said that even though his adventure was like that, he was still not discouraged. He even got to the point where even his friends insulted him with “bad” words coming from different mouths. *“Yung mga sinasabi ng mga barkada ko na tigilan mo na yung pag-aaral mo muka kang kawawa”* The insults of his friends did not hinder him and they gave him the courage to continue his studies. Instead, he exercised the desire to graduate. He said *“Hindi ganun ang nanggagaling sa isip ko nun. I will finish my studies kahit anong mangyari”.*

### Challenges

**Family. (Work hard).** Ginoong Dodoy became aware of the poverty early on because he was still a child when his father left them. He witnessed what his mother struggles in life. Sometimes they get to the point where they are nothing. But for him, it didn't stop him from pursuing his dreams. With the help of his mother, Ginoong Dodoy worked hard to study hard so that he could finish the course he took. He stated, *“halos pitong malalaking krus ang pinapanik ko sa bundok nung nag-aaral ako. Ibig sabihin ang hirap ng buhay ng pamilya naming nun”.*

**Marriage.** Ginoong Dodoy's lessons is to be strong in the marital relationship. He stated that quarrels or misunderstandings between the couples are difficult to resolve. They are not perfect in their relationship, just like other couples, because disagreements about things and circumstances are inescapable. He noted the misunderstanding that led to the quarrel as one of his points. Ginoong Dodoy did not provide an example, but he did say that it sometimes gets to the point where he sins against his wife. But, because he loves his wife so much, he does not let their relationship fall apart right away. He said, *“Dumarating kasi sa parte ng buhay ng lalaki yung minsan nambababae, umiinum. Dapat yun paglabanan mo, kaya nga may mga naghihiwalay na mag-asawa eh hindi mapaglabanan”.* In addition he said *“pagdating sa buhay mag-asawa fight lang, kailangan huwag kayo susurrender.”*

**Education.** Hardship did not discourage him even though he only earns about three hundred pesos per month. Ginoong Dodoy persevered and he just continued his work, until he was given the opportunity to show his ability in office work. Ginoong Dodoy is very proud of himself because he said *“From utility man to research assistant”.* *Dahil sa pagtatanong- tanong, natutunan niya ang mga trabaho bilang research assistant. “Magtanung ka lang, huwag kang magyayabang pag hindi mo alam”,* He said.

**Case 6. Ginang Sonia** is a seventy-year-old woman who was born and reared in Mandaluyong and now dwells in the Brgy. Quezon, Talugtog, Nueva Ecija, with her family. She is the only female among her five siblings and the youngest.

### Golden Life Lessons

**Family. (Be a good mother).** Ginang Sonia's golden life lesson to her family is to be a good mother to her children. She thinks it all comes down to how the parents raise their children's conduct. She said she taught her children many sermons and disciplines. One of these is that she has them do household duties so that they can learn about them and volunteer. That is why, when it comes to discipline her grandchildren, it is the one that her children are now learning. She demonstrated that shouting at a youngster has negative consequences for the child. Ginang Sonia's children grew up well as a result of her love for them. *“Pag-gising mo sa umaga aakapin mo siya, madadama niya yung init ng pagmamahal mo. Small pa lang siya aakapin mo na siya hanggang sa paglaki kailangan niya yun”*

**Marriage. (Just Love).** Ginang Sonia spent her childhood yearning for the love of a true family. She learnt to love her neighbor because she knew what it was like to be loved by no one, especially a true family. When she got married she applies the love he has acquired to others sincerely. *“Pero hindi ko nilalaban yun tsaka hindi ko pinapansin, parang sa puso ko siya ang blessings. Kaya siya mahal in mo siya”* she said.

**Education.** Dreams do come true through education, but because of lack of opportunity and poverty many of filipinos does not even finish elementary level, Ginang Sonia's case prove that poverty alone will not kill your dreams to be successful even though there a lot of hindrances and challenges along your way. *“Mahalaga ang pag-aaral, natutunan ko na ahhhhm narealized ko na dahil sa kahirapan maraming di nakakapag-aral, kaya nagpursige ako kahit mahira ang aral ako pagdating sa pag-aaral, ito yung pahalagahan ito”*



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### Challenges

**Family. Family (Help the unfortunate).** Ginang Sonia considers a challenge in family and marriage is to help the poor. she said, she started with hardship when her husband always says *“sobra – sobra na yang binibigay mo sa ibang tao kumpara sa mismong pamilya natin”*, she knew the feeling of receiving grace from another person so she wants to give more patience for her husband this kind of realization. For her, giving them is a small thing because she is willing to share the blessings she receives. It is very important for Ginang. Sonia to help the poor because for her, this lesson is a flashback to the help she has received from other people. This is the statement that she had *“dahil nanggaling nga ako sa mababa, kung бага may tumutulong sa akin noon. Kaya ngayon ibinabahagi ko naman. Parang inililipat mo rin”*.

**Marriage.** To Ginang Sonia she emphasized that a successful and fulfilling marriage is validating marriage, both represented by a relationship in which the couple is open to compromise and calmly works toward conflict resolution that a true meaning of golden life lesson when it comes to marriage. She said, *“Ang tunay na golden life lesson sa aspeto ng pag-aasawa eh... Yung marunong ka makuntento sa asawa mo, saka pag may hindi pagkakaintindihan maging kalmado at pag-usapan ng maayos kasi doon lang maayos ang problema, yun ang natutunan ko sa pag-aasawa”*. As the marital relationship pertains to dealing with new issues and problems that arise, with the couple utilizing the resources available at each stage of life of the relationship.

**Education.** Another life lesson and challenges taught by Ginang Sonia is to be diligent and patient even you feel empty and exhausted. She stated that she completed her education as a child and began working to support her family at a young age. *“pinagtiyagaan ko na lang talaga, kahit na kako four (4) pesos lang ang kita”*. For her it doesn't matter if her income is big because she is proud that she was able to endure to support herself.

## DISCUSSION

### Golden Life Lessons of the Retirees

According to the findings of the study, retirees have many lessons to learn and many stories to tell about significant events in their lives. In terms of the Family, Be a good parent (father or mother) Work hard (be diligent and patient), appreciate education (study hard and graduate), and be a decent parent are just a few of them (guide the child well). It also entails assisting others (helping the unfortunate and being grateful). It is explained one by one in order to structure the sequence.

**Family. Be a good parent (father or mother).** It turns out in the study that the golden life lessons of the retirees are to be good fathers and mothers to their children. In this study, the retirees value their parenting because the welfare of their offspring is also important for the participants so they do well in their role as parents. Retirees can show their good motherhood or fatherhood in various ways such as love, good guidance, giving advice and discipline to children. Most of the participants, when their children were young, were already teaching them correct and good manners. This result is consistent with a study conducted by the (Salerna, et.al. 2015). which found that parents constantly monitor their child as an effective method because they become successful in everything they do. It is clear from this study that there is a respective method or retirees' approach how they have demonstrated their good parenting to their children. Before they give sermons to their children, they first make sure that the lesson they are going to share with them has already been done on their own.

They went through a severe test like the two of the participants, they experienced a severe test in the children due to unexpected events. Instead of letting them go they still choose what is best for their children. Believing that no one else will help them if they are not the parents themselves. In analyzing each result in this study, it is a huge thing to be a good parent to children because it brings success in all aspects of life. It turns out that being a good parent should be given more attention and importance than anything else. So, they believe that the proper care and guidance they give their offspring is the key to success in life.

This agrees with a study conducted by Pepin and Deutscher (2011) that whenever a parent monitors any aspect of what their child is doing, a large percentage of it results in success for the child. It is undeniable that the retirees are happy with the success achieved by their children. Because of all the success they have achieved most they consider the cause of their success is the success their children have achieved in life.

Overall, it appears that it is common among the older participants that what they have learned in their lives is also what they share with their children. This is in line with the study conducted by Brossoie (2010), that the important experiences of retirees in their lives, particularly those who have a lesson, they often share it with other people, especially their family members. Many sermons the participants shared with their children. Although they have different approaches to how they show their good parenting to children. It turns out that they had only one goal as parents, for their children to be successful in all aspects of life.

**Marriage.** According to the results of the study, it turns out that when it comes to marriage life learned to give and take, satisfied be contented and to love unconditionally are the important lessons of the retirees. This is a lesson that can be considered to them because for the participants it is very noble and part of the family is to have a wife or husband that really understands you no matter what miscommunication or conflict arised. Aside from the lessons mentioned above as a result, it also turns out

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that retirees still have lessons. Some of these are to love one's neighbor, to set aside one's own home when one has a family, to have ambition in life, to stand up for rights, to be strong in marital relationships and to be a good leader. In these lessons, it became evidenced in the study conducted by Mandigma, (2016) that retirees are known to be abundant or rich in life lessons and experiences. In general, if the main lessons of the retirees are examined carefully, it will be noticed that the stories of their life lessons are interconnected

**Education. Work hard (be diligent and patient).** It was found that all participants went through hardship first before achieving success in life. Because of the poor living conditions of them then, they persevered to graduate as a means or be the key to their dreams until they worked hard at their jobs and businesses. Their suffering and endurance then became a test for them which was the reason for their success, this is supported on the study of (Pavarini et al. 2017). They dreamed of finishing school, but it was not easy for them because their life was difficult then so they worked. They worked hard, persevered, they worked hard to finish their education to get out of poverty. At their sacrifice then it turned out that education was the solution for them to reach the life they have today. They proved that education was the key that saved them from poverty. And when they have been successful in their lives, they have not forgotten the people who helped them when they were still poor. As a result of these experiences, they have learned many lessons so that when it comes to their children they already know what is good and not for them, because they are already living their lessons learned in life.

Perhaps the success that retirees have is a result of or caused by their way of carrying on. If only the majority would live and follow the lessons and experiences learned by retirees, will perhaps guide them towards the path of success (Bonsang, E. & Klein, 2011). Because they will know the ingredients and techniques to be successful in all aspects of life. Also, it is possible to avoid doing things that have a bad cause. Throughout the study and in the researcher's extensive analysis of the results it is possible that the important lessons of the retirees have become a guiding model towards life success. In this study, it turned out that the retirees had motivations to work hard in life in the past. One of them is the ambition or goal in life to complete their education. In their desire to reach life's dreams, the participants then worked hard through their perseverance in earning a living in conjunction with their studies.

### Challenges of the Retirees

Retirees have similar obstacles in terms of family, marriage, and education, according to the conclusions of the study. When it comes to marriage, one of the respondents had a romeo and juliet love story, in which they conquered simply for love. And, in terms of education, all of the respondents had been poor and had struggled to complete their schooling.

**Family & Marriage.** Another of the findings of this study was the motivation of the men in the way they were viewed by their fellow human beings, particularly in the parent of their spouse or father-in-law. It can be seen that two of the participants tasted hurtful words and were judged by the wrong view from their spouse's family. According to these retirees, they have become more determined to work harder to step up and prove to them that the false allegations about them are not true. It is clear from the study that the poverty they experienced is the main reason for their hard work in life along with their desires or preferences. In other words, these retirees experienced extreme hardship with life and this became their motivation to fulfill the words uttered. In general, for the women, their motivation was their life goals while the male participants were motivated by looking down (Luhmann, 2014).

**Education.** Retirees highly value education because it emerged from this study that participants believed that learning was essential to a person's life. It turned out that all participants made it a goal to graduate because education was the only hope and key they saw to get out of poverty. It became a way for them to have the good future they have in the present. It was planted in their minds that they would graduate and they made that possible. Served as an investment by retirees then the education to have a good future today. It turned out that many of the participants went through intense trials and sacrifices before achieving success in the educational aspect.

There were many solutions and ways for retirees then to get an education, one of them was trying to do to study hard to get a scholarship to be able to enroll for free. It turns out that along with their diligence in their studies, they combine their livelihood so that they can save extra for school expenses. They have not failed in the belief that there are many solutions and ways to achieve this goal because they have completed their college education up to the highest level of education. It was also clear from the result that because of their appreciation for education, they were able to raise their children and did everything to educate them. This was found to be consistent with the study conducted by Lalor, Doyle, McKenna, and Fitzsimons (2009), that retirees value experiences through of applying them to the situation of another person or their immediate family. The previous study and even the current study only prove that adults value their life lessons by applying their experiences to their children. They want the children to be able to finish school so that they too will have a weapon against the hardships of life (Tavares, et.al. 2014).



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But this has not been a barrier to not graduate because despite the trials, they still continue their children's education. Nevertheless, the overall result regarding education can be said to be a very important lesson to the elders, who despite the lightness and weight of the trials they have been able to overcome all of them in the desire to have good education. The retirees just proved that poverty in life is not a barrier to not being able to finish school. This result is consistent with the study of Chen (2014).

### CONCLUSION

Golden Life lessons and challenges of the retirees plays important learnings in their life. This study concluded that the main lessons of retirees are to work hard (work hard and persevere). Their poverty is the main reason for their effort's despite of the different situation of their family and quality of life, also there are many golden lessons of the retirees not just in the aspects of family, marriage and education, Furthermore there are different stories of important lessons for them, some of these are to work hard, value education, be a good parent and help others, also having an education has been the key and path to their success in life. By being good parents of the retirees, they raised their children well which also led to their success. And lastly giving retirees time with their children is an effective way to have good relationships and communication with their family as well as their marriage.

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## There Goes My Life: Prevalence of Early Pregnancy to Gen Z Students



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**ABSTRACT:** This study aimed to determine the prevalence of early pregnancy to gen z students using an interview as the main instrument. The findings of the study revealed that the number one factor that influenced the prevalence of early pregnancy to Gen Z students was family. Peer Pressure was the second factor, and the last factor was spiritual engagement. The employed style of Gen Z students along with social were chatting with siblings and other important people which helped them cope more easily with the situation. While the psychological aspect was self-talk this was a very effective coping strategy for Generation Z students. They used this to effectively compose themselves and tell themselves to be firm in difficult situations. They learned to dream and took on parental responsibilities for their children. They were also pursuing their studies for the sake of their children's future. Reading Wattpad, watching K-dramas, playing cellphone games, and using Facebook are some of their coping mechanisms. With the employed style of Gen Z students along with a spiritual aspect, Gen Z mothers' spiritual beliefs became stronger. They also read inspirational books as a way of coping.

**KEYWORDS:** Coping Styles, early pregnancy, prevalence, teenage mothers

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### INTRODUCTION

Adolescence is a period of life when teens adjust to physical and emotional changes [14]. Due to tremendous peer pressure, teenagers choose to go with their peers rather than their parents. Early adolescence is also associated with sexual maturation [15]. One of the challenges they may face is teenage pregnancy, which leads to female secondary school dropouts [12]. This situation is obvious to educators, policymakers, and the general public, and is thus deemed a huge societal issue. A United Nations Fund for Population Activities (UNFPA) country representative reported the frequency of teenage pregnancies in the Philippines has increased by 70% in the last ten years [6]. According to a UNFPA country spokesperson, the incidence of teenage pregnancies in the country is a source of worry to which the agency is paying close attention, exposing young females (10-19) to significant risk. The number of pregnant young women in the country is on the rise, with most of them unmarried. Young women are more susceptible to mortality during pregnancy; thus, they are physically and mentally unprepared for motherhood. This indicates that young women lack proper pregnancy information. Social determinants of health, such as low education and low-income levels of a teen's family, may contribute to high teen birth rates. [9]. Teens in certain settings are at higher risk of teen pregnancy and birth than other groups. Students with low self-esteem and poor academic achievement have unrealistic educational expectations. Unsafe sex, deprivation, substance abuse, school dropouts, poor academic achievement, and low family income are all factors that impact adolescent pregnancy [2]. Many researchers believe that the future of teenage mothers will be sad and that they will face some difficulties. Teenage moms generally lack skills after pregnancy, resulting in low-paying and sometimes unpleasant professions; nonetheless, other young mothers worked out of necessity since they had no other option. A major concern for a teenage mother is ensuring that her child has a great future. However, there were extra, broader benefits in addition to the money. Working gave women a sense of pride, confidence, and much-needed social interaction. Teenage pregnancy has become a complex issue for various authorities. These organizations offer programs that help to avoid teenage pregnancy. Special programs on family life and reproductive health, reduce the frequency of teenage pregnancies, as well as alcohol and drug abuse [1].

Teenage pregnancy at Camiling School for Home Industries became prevalent especially this pandemic so the researcher decided to have a study that sought to determine how do the following factors affect prevalence of early pregnancy of the Gen Z students: peer pressure; family background and upbringing; and spiritual engagement and what are the employed styles in coping with the early pregnancy of the Gen Z students along: social, psychological, and spiritual.

## There Goes My Life: Prevalence of Early Pregnancy to Gen Z Students

### STATEMENT OF THE PROBLEM

This study aimed to determine the prevalence of early pregnancy to gen z students.

Specifically, sought to answer the following questions:

1. How do the following factors affect prevalence of early pregnancy of the Gen Z students:
  - a. peer pressure;
  - b. family background and upbringing;
  - c. spiritual engagement
2. What are the employed styles in coping with the early pregnancy of Gen Z students along:
  - a. social,
  - b. psychological, and
  - c. spiritual

### METHODS AND PROCEDURE

This chapter presents the methods and procedures used in securing data how these were translated in the completion of the study. Specifically, it presents the instruments utilized in gathering the important data, together with the process that followed in the analysis and interpretation of the data.

#### Respondents of the study

The participants of the study were five (5) Gen Z mothers aged 13-19 years old during the time of their pregnancy who are enrolled at Camiling School for Home Industries during the School Year 2021-2022.

#### Research Instrument

The main instrument used was interview guide. Interviewed Five (5) Gen Z student aged 13-19 years old during the time of their pregnancy who enrolled at Camiling School for Home Industries during the School Year 2021-2022. They were selected from grade 11 to 12. They were confidentially identified from grade 11-12. The respondents answered the questions through one-on-one interview. This was validated by psychometrician, guidance counselors and other related professionals.

### FINDINGS AND DISCUSSION

The data gathered and their corresponding analysis and interpretation are presented in this chapter.

The main objective of this study is to describe the prevalence of early pregnancy in gen z students. The factors that affect the prevalence of early pregnancy of the Gen Z students: are peer pressure; family background and upbringing; spiritual engagement and employed styles in coping with the early pregnancy of the Gen Z students along: with social, psychological, and spiritual.

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The researcher, in order to have an accurate analysis and interpretation of the data gathered about the factors that affect the respondents and employed coping styles, recorded the interviews conducted. Pseudonyms were used to withhold the identity of the respondents. The factors that affect the prevalence of early pregnancy in Gen Z students: are peer pressure; family background and upbringing; spiritual engagement, Further analysis of the transcribed interviews in each theme led the researcher to classify their responses into sub-themes. The themes and sub-themes are presented in the matrix found below.

##### Theme 1: "Factors that Affect the Prevalence of Early Pregnancy Along with Peer Pressure"

The transcription and interpretation of the factors that affect the prevalence of early pregnancy led to the formulation of the first theme and its corresponding sub-theme. The theme describes how peer pressure, family background, upbringing also spiritual engagement influence the prevalence of early pregnancy in Gen Z students.

The results of the interview revealed that these different factors affect them to engage in early pregnancy, especially their family. The following are the testimonies of the participants.

**Participant 1:** Case of Hazel F. Simbre (18 Years old at the time of pregnancy)

*"Namamasyal po gaya ng monasteryo kasama ng mga barkada at mga boyfriend. Hindi naman po kami marami" Hindi po kami nag-iinuman. Kain kain lang po. Mam, pagnamamasyal po kami kasama ko boyfriend ko. Yong nakabuntis po sakin un napo un kasa ksama ko.*

**Participant 2:** Case of Reima Simbre (18 Years old at the time of pregnancy)

*"Dati sina clarissa, Jessa, and Ederlyn Food trip, gala sa mga ilog kami kami lang po magkakabarkada magkakasama. Meron po mam lalaki mga classmates lang po naming. Hindi po barkada nakaimpluensiya sakin mam kasi mam parang naano lang ako sa nangyayari sa family ganon.*

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**Participant 3:** Case of Angela Abelleara (17 Years old at the time of pregnancy)

*"tatlo po kaming magkakaibigan, pumunta po kami sa church don ko po nakilala boyfriend ko"*

**Participant 4:** Case of Mina dela Cruz (16 Years old at the time of pregnancy)

*"Nakikita ko po mga barkada may mga boyfriend sa cp, don kami nagkakilala tas chat chat. Pag may occasion nagkakayayaan, barkada at inuman"*

**Participant 5:** Case of Ericka Magat (18 Years old at the time of pregnancy)

*"Di po ako masyadong sumasama sa barkada, yong nakabuntis po sakin ay nereto lang ng cousin q po at 5 years po kami magkarelasyon bago po ako nabuntis"*

Participant # 1 mentioned that she hangs out with her friends and their boyfriends. She got pregnant by her boyfriend, who is also in their group. On the same note, participant # 2 also hangs out with her friends, but only female friends. Their usual activities are chatting and food trips. Participant #3 revealed that her friends are good influences, and they go to church regularly. He met her boyfriend at their church. Participant # 4 stated that her friends have boyfriends. They hang out occasionally. But she met her boyfriend through a cellphone. They chatted with each other, and that was the beginning of their relationship.

According to the findings of the study on Theme 1: "Factors Affecting the Prevalence of Early Pregnancy" and Sub-Theme 1: Peer Pressure, this is the second factor influencing the prevalence of early pregnancy among Gen Z students. They enjoy hanging out with their friends, which leads them to become acquainted with the opposite sex, and they are unable to control their emotions, which leads to early pregnancy.

### Theme 1: "Factors Affect the Prevalence of Early Pregnancy along with Family Background and Upbringing"

Below are the transcriptions of the participants' responses when asked about family background and upbringing.

**Participant 1:** Case of Hazel F. Simbre (18 Years old at the time of pregnancy)

*"Parang walang pakialam...minsang kapag nag-aaral wala lang sakanila. Mas iniisip nila para sakanila lang. Minsang mam kahit ginagawa muna ang lahat parang wala lang. Nagrebelde po ako. Kumukuha po ako ng lakas sa partner ko ngayon. Hindi po aq mahilig magsuot ng mga revealing clothes...hindi rin po ako pinapayagang uminom....sobrang laki napo ng problema dahil puunta sa abroad si mama at nagkaproblema siya don at si papa ay nawalan ng trabaho lagi po akong pinag-iinitan dahil kinukulang sa budget pamilya...Nong nangyari po samang boyfriend un iniisip ko nalang po yon na yong way para makalayo"*

**Participant 2:** Case of Reima Simbre (18 Years old at the time of pregnancy)

*"Feeling ko pag kasama ko boyfriend ko mas nailalabas ko ang nararamdaman ko. Fiesta sa Camiling May 8, 2015, text text after 3 months naging syota ko siya. Breneak ko nong may nangyari samang. Lumayo siya pumunta manila. Nong umuwi siya after one year nagkita na. Usap-usap medyo nagtagal naging close na. Nadala din po sa sinabi ng boyfriend na paninindigan. parang gusto ko sa boyfriend ko at family nila. Okay naman po mam lhat naibibigay nila at masyado silang tiwala...bata papo ako...ang boyfriend secret secret lang...umiinom po ako kasama ng mga pinsan at auntie"*

**Participant 3:** Case of Angela Abelleara (17 Years old at the time of pregnancy)

*"Ayaw payagan gumala at di puwedeng umuwi ng gabi...di rin po sila pumapayag makipag inuman...kasi mam kwan ngpaalam ako sakanila na magka boyfriend...Pangalawang punta po pumayag naman sila..hindi po ako nagsusuot ng maiikli dahil po mataba ako. dipo bagay"*

**Participant 4:** Case of Mina dela Cruz (16 Years old at the time of pregnancy)

*"Very strict sa time mga magulang...yes mam. okay lang po na mag boyfriend pero ang strict lang po nila mam basta alam lang ang ano ang bawal...Hindi po ako nagsusuot maiikli kasi feeling ko pinagtitinginan ako ng mga tao...hindi po ako pinapayagang uminom ng parents ko kasi parang walang respeto kasi hindi un pagpapalaki nila sau. Nong nalaman nila mam kasi napansin ako ng tita ko kasi kakauwi nla galing manila mam don nila napansin parang nangangayayat don na nagstart na mga ano...mga 5 days sila don tas nong 4 days n sila don iba talaga napansin nila tas pinaamin nila ko non. Yong time napo un umamin narin ako kasi pinapatest ni mama ung pt."*

**Participant 5:** Case of Ericka Magat (18 Years old at the time of pregnancy)

*"Strict po kasi parents ko dahil nag iisa lang po ako anak. Kais po 5 years old palang po ako umalis npo mama ko pumunta abroad. Si papa ko nmn po pumunta sa maynila nagtrabaho po. strict lalo na sa pamamasyal" Parang di po nila ko napapansin kaya po nong nag-aaral po ako parang nagrebelde npo ako.Hindi po ako pumapasok kasi iniisip ko ginawa ng papa ko kasi grade 4 ay grade 5 po naghanap na siya ng iba kasi grade 3 o grade 4 un po ung nambababae na siya. Nasa ibang bansa po mama ko. Si mama ko po magulo po tloga utak niya meron pa nga po non umuwi tloga siya grade 6 ako bigla pong nanganak ung nabuntis ung papa ko.....parang nabigla po kaya biglang nanganak 7 months palang po. Parang nataranta...papa ko po tloga nauna at habulin ng babae.. meron narin po kasama mama ko at may nak na 1 at sa papa ko po 2 sa ibang babae.,,ng nagkaron ng karelasyon si papa don po aq ngrebelde gaya ng hindi po aq pumapasok...naghanap po ako ng kalinga at pagmamahal ng*



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*magulang at para po mapansin ako nagrebelde po ako. Lola ko po ang nagpalaki sa akin at pinapayagan naman po niya ko magboyfriend dahil okay naman po iyong lalaki...hindi po ako nagsusuot ng maiikli kasi feeling ko po nababastos ka lalo na pinagtitinginan ng mga lalaki...pinapayagan po akong umino pero sa bahay lang, occasionally”*

As mentioned, participant #1, described her parents as uncaring for her. Nobody cares if she studies. Her partner became a source of inspiration for her. Her family became disorganized; her mother moved abroad, and her father lost his job. Because of financial constraints, they hurl blame and rage. She wishes to be away from her family, so she chose to live with her boyfriend. Similarly, participant #2 feels safe and happy and wishes to have a family like her boyfriend. Her parents believe in her, but due to a dysfunctional family and a lack of financial support, she prefers to spend time with her boyfriend. Participants 3, 4, and 5 have strict parents but are allowed to have a boyfriend, which may lead to early pregnancy.

The number one factor influencing the prevalence of early pregnancy among Gen Z students is family. Participants with dysfunctional families, such as participants #1, 2, and 5, tend to be irrational and guided by their emotions. Furthermore, giving so much trust to parents may lead to Gen Z students abusing it. Being strict while allowing them to have a relationship with the opposite sex at a younger age may also lead them astray.

### Theme 1: “Factors that Affect the Prevalence of Early Pregnancy Along with Spiritual Engagement”

Below are the transcriptions of the participants’ responses when asked about spiritual engagement.

**Participant 1:** Case of Hazel Simbre (18 Years old at the time of pregnancy)

*“Born Again po ako...nasira po isip ni mama sa simbahan. umikot po mundo niya sa simbahan...Hindi po maganda turo ng simbahan kasi po huhihingi sila ng donations”*

**Participant 2:** Case of Reima Simbre (18 Years old at the time of pregnancy)

*“Born again ang religion not totally po ngsisimba”*

**Participant 3:** Case of Angela Abelleara (17 Years old at the time of pregnancy)

*“Pumupunta naman po sa church at naniniwala kay God”*

**Participant 4:** Case of Mina dela Cruz (16 Years old at the time of pregnancy)

*“Nong magkokontak mam parang inisip ko mahirap mam pag nagawa naming un. Sa una mam parang kinakabahan pero nong ano napo mam dikona alam nasa isip ko. madalas po magsimba. iglesia po ako pero nagsisisi po ako sa nangyari”*

**Participant 5:** Case of Ericka Magat (18 Years old at the time of pregnancy)

*“Catholic po ako at minsan lang po ako magsimba”*

Participants 1, 2, 3, and 5 revealed that they did not attend church on a regular basis. Participants 1 and 2 have no faith in their church because of negative practices such as soliciting donations and the reason their mother religiously brainwashes them. Although Participant 4 was the only one who always went to church, her emotions overruled her.

People with weak religious beliefs may be misled as well. They have the potential to easily lead to temptations, as evidenced by the participants' responses. Their spiritual beliefs, such as attending church and praying, are frail.

### Theme 2: “Employed Styles in Coping with the Early Pregnancy of the Gen Z Students along with Social”

Below are the transcriptions of the participants’ responses when asked about employed styles in coping with the early pregnancy of the gen z students in the social aspect.

**Participant 1:** Case of Hazel F. Simbre (18 Years old at the time of pregnancy)

*“Nakikipagkwentuhan sa kapatid...Nag-eexercise halimbawa po simple stretching”*

**Participant 2** Case of Reima Simbre (18 Years old at the time of pregnancy)

*“Nakikinig sa mga payo ng mga kapatid”*

**Participant 3** Case of Angela Abelleara (17 Years old at the time of pregnancy)

*“Nakikipagkwentuhan kina mama para po mawala mga negative vibes”*

**Participant 4** Case of Mina dela Cruz (16 Years old at the time of pregnancy)

*“Seek po ako ng advice sa mama ko at mas lumapit po kami sa isat-isa” Siya rin po ngaadvice sa akin kung wla dn po sina mama ko hindi ko rin po alam gagawin ko kasi first baby po talaga. Sila po nanjan para sa akin kasi pag may sakit po anak ko parang sila po ang nag aano na gumastos para samin. Parang kapatid ko lang po anak ko kasi sila po tlga mam umaalalay samin sa lahat.*

**Participant 5** Case of Ericka Magat (18 Years old at the time of pregnancy)

*“Opo mam sobrang stress po talaga mam. lahat po ng problema sinasabi ko sa lola inaadvice niya po na wag kang magpapa apekto kasi maaapektuhan ang bata. Sobrang stress po tlga. Nong unang buwan papo gusto ko po tlagang ipaano....ipa abort po pero ” Pinigilan po ako nil lola at bf ng nag-iisp ako ng abotion. Sabi po nila cge pag ginawa mo yan dudugin ka malalaman din ng tao. One-time po nong dumating tita ko, galit na galit po siya. Umalis po ako at sinamahan po ako ni lola ko di nya po ako pinabayaa...At iniisip ko din po kasi sasabihin ni papa. Sayang po sabi ni papa kaya ituloy ko parang din po nagiging mas okay*

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*relasyo naming ni papa siguro po dahil na din sa baby...mas nagging okay relasyon namin ni papa at mama dahil naiintindihan nila ko...Okay naman po ki mama may communication naman po kami di nman po siya nagalit kasi...Sabi ko nalang po iisipin ko nalang po baby ko.*

Participant number 1 cited her employed coping style as chatting with her sibling, while participants numbers 3 and 4 chatted and sought advice from their mother, and participant number 5 confided all her problems to her grandmother.

This simply means that gen z students must have ears to hear and hearts to understand this situation. According to Kidwell (2004), Thompson (2014), and Okeyo (2012), who claim that having people around her who can help with childcare reduces the stress on the Gen Z mother.

### Theme 2: "Employed Styles in Coping with the Early Pregnancy of the Gen Z Students Along with Psychological"

Below are the transcriptions of the participants' responses when asked about employed styles in coping with the early pregnancy of the gen z students in the psychological aspect.

**Participant 1:** Case of Hazel F. Simbre (18 Years old at the time of pregnancy)

*"Kinakausap ko sarili ko at sinasabing ito nalang yong magiging dahilan o inspirasyon"*

**Participant 2:** Case of Reima Simbre (18 Years old at the time of pregnancy)

*"kahit anong gawin ko nangyari na imotivate nalang sarili maging positive...cellphone cellphone lang po laro laro para malibang...mas nagiging responsible po ako at natutung mangarap"*

**Participant 3:** Case of Angela Abelleara (17 Years old at the time of pregnancy)

*"Nag-iisip lang ng masasayang mga moments...Umiiyak po ako konting kibot lang po umiiyak po...nanonood lang po ng funny videos sa youtube"*

**Participant 4:** Case of Mina dela Cruz (16 Years old at the time of pregnancy)

*Parang siya nalang iniisip ko mam na kahit anong isipin ng tao...nalang po na ang priority na maging isang ina na kakayanin ko po na mapapalaki ko ang bata" noon po balak na tlga naming ipa ano ang bata pero Malaki napo non. Malapit din po siya sa tatay niya kahit dina kami nagsasama...nagread lng po ako ng mga watsapp para malibang" or minsan Kdrama.*

**Participant 5:** Case of Ericka Magat (18 Years old at the time of pregnancy)

*"Regret, iniisip ko nalang ang baby ko at hindi ko siya pababayaan...naglaro po ng cp nagccandy crush. Nagkkulong s kwarto umiiyak. Nililibang ko nalang po sarili ko sa bahay, naglilinis ng bahay at nag ffb"*

As participant number 1 mentioned, her coping strategy is self-talk; she told herself that her child would be her reason and inspiration. Participant number two uses self-talk as well, telling herself to be positive and motivate herself. She also played games on her cell phone. She learned to be responsible and to dream because of this. Participant number three, on the other hand, fantasizes about happy times and enjoys watching funny YouTube videos. Self-talk was also used as a coping strategy by participant number four. She told herself that her child was her priority, regardless of what others thought. She also copes by reading Wattpad and watching K-drama. The last participant always prioritized her child. She also enjoys Candy Crush and Facebook. She also cleans the house as a way of coping.

This simply means that self-talk is a very effective coping strategy for Generation Z students. They used this to effectively compose themselves and tell themselves to be firm in difficult situations. They learned to dream and took on parental responsibilities for their children. They are also pursuing their studies for the sake of their children's future. Reading Wattpad, watching K-dramas, playing cellphone games, and using Facebook are some of their coping mechanisms.

"The Phenomenon of Teenage Pregnancy in the Philippines" 'Futurity: Building New Dreams' is the final emerging subject. This topic represented the teenage mothers' faith, hope, and love for their children as they faced hardships in their life. Teenage mothers began to create new hopes and goals for themselves and their families here. This time, they are stronger, more powerful, and wiser. Everyone believes that everything happens for a reason. They were able to adjust, adapt, and deal despite the ups and downs in their lives. As a result, they are all prepared to embark on the next phase of their lives [11].

### Theme 2: "Employed Styles in Coping with the Early Pregnancy of the Gen Z Students Along with Spiritual"

Below are the transcriptions of the participants' responses when asked about employed styles in coping with the early pregnancy of the gen z students in the spiritual aspect.

**Participant 1:** Case of Hazel F. Simbre (18 Years old at the time of pregnancy)

*"Always praying...nakikinig sa social media about life lessons"*

**Participant 2:** Case of Reima Simbre (18 Years old at the time of pregnancy)

*"Nagbabasa inspirational books dahil parang pinanghihinaan po ako para lumaban lang. Hindi po ako nagsisimba pero sa pray lang po"*

**Participant 3:** Case of Angela Abelleara (17 Years old at the time of pregnancy)



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*"Yes mam yong mga quotes po. reading para gumaan po ang loob ko"*

**Participant 4:** Case of Mina dela Cruz (16 Years old at the time of pregnancy)

*"Yes mam simula po nong nagawa ko un mam palagi npo akong nagppray parang nagssorry po ako kung bakit ko nagawa un ganon po."*

**Participant 5:** Case of Ericka Magat (18 Years old at the time of pregnancy)

*"Tumatag po ang aking pananampalataya at laging nagsisimba at nagppray"*

Participants 1, 2, and 5 mentioned that they always pray and listen to social media about life lessons. Participants 2 and 3 relaxed by reading inspirational books and quotes.

After the situation (teenage pregnancy), Gen Z mothers' spiritual beliefs become stronger. They also read inspirational books as a way of coping. Student mothers face several obstacles due to their dual roles as mothers and students. Lack of support is frequently encountered because of other problems such as a lack of funds and restricted time. During this moment, though, people must be tough and resilient. Student-life mothers can be changed by being positive and having a strong spiritual belief. Their coping tactics comprised problem-focused, avoidance, and emotion-focused strategies and the help they received when restarting their studies was spiritual and social support [8].

## CONCLUSIONS

### **"Factors that Affect the Prevalence of Early Pregnancy"**

1. The number one factor that influenced the prevalence of early pregnancy to Gen Z students was family. Participants who had dysfunctional families tend to be irrational and guided by their emotions. Furthermore, because their parents trusted them so much they abused it and it led them to early pregnancy.
2. Peer Pressure was the second factor influenced the prevalence of early pregnancy to Gen Z students. Participants enjoyed hanging out with their friends, which led them to become acquainted with the opposite sex, and were unable to control their emotions, which leads to early pregnancy.
3. People with weak religious beliefs misled as well. They have the potential to easily led to temptations, as evidenced by the participants' responses. Their spiritual beliefs, such as attending church and praying, are frail. This is the last factor affecting the prevalence of early pregnancy to Gen Z students.

### **"Employed Styles in Coping with the Early Pregnancy of the Gen Z Students"**

1. The employed style of Gen Z students along with social were chatting with siblings and other important people which helped them cope more easily with the situation. This simply means that gen z students must have ears to hear and hearts to understand this situation.
2. The employed style of Gen Z students along with psychological aspect was self-talk this was a very effective coping strategy for Generation Z students. They used this to effectively compose themselves and tell themselves to be firm in difficult situations. They learned to dream and took on parental responsibilities for their children. They were also pursue their studies for the sake of their children's future. Reading Wattpad, watching K-dramas, playing cellphone games, and using Facebook are some of their coping mechanisms.
3. The employed style of Gen Z students along with spiritual aspect, Gen Z mothers' spiritual beliefs became stronger. They also read inspirational books as a way of coping.

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## Get Ready To Be Techy: Struggles of Senior Citizen Teachers in the Utilization of Technology in the Classroom



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**ABSTRACT:** The study was conducted to determine the struggles of senior citizen teachers during the S.Y. 2021 - 2022. The descriptive qualitative method as research design was used and an in-depth interview was utilized in data collection.

The study reveals that majority of the respondents have no choice but to keep up with the use of technology in their teaching so that they will not be left behind. In this time of digital world we are now living in, it is important to use and integrate technology in teaching to catch the attention of the learners who are now called digitally natives. Research shows that integrating technology in the teaching-learning process will benefit learners and they will easily understand their lesson with the use of video lessons. The more senses they use, the better the comprehension and retention of their lessons. It will also lessen the time and effort of teachers in making instructional materials and it will make the discussion livelier.

There are also advantages and disadvantages of the utilization of technology inside the classroom. It has also its limits. Some identified struggles of senior citizen teachers were namely; lack of available gadgets, poor internet connection, sudden power interruption and lack of basic knowledge of the older teachers in the operation of such modern gadgets. But luckily enough, they have their supportive co-teachers and family members around them who are willing to assist them.

**KEYWORDS:** Senior Citizen Teachers, Technology Integration, Gadgets, Struggles

### INTRODUCTION

Given that those born in the 1950s, 1960s, and 1970s did not grow up with microwaves, cell phones, cable television, or computers, technology has improved tremendously in the last 40 years. As technology advances, the baby boomers and subsequent generations may find it difficult to stay up. Older persons between the ages of 50 and 100 may have firsthand experience with this difficulty and may be scared by technology improvements [1].

Surprisingly, one of the topics that must be considered is senior citizens' struggles regarding utilization of technology in this new normal in education. With elderly people at higher risk of infection, it's unclear how the country's public schools would reopen if a third of the teaching workforce refuses to face those risks [2]. ICT integration is also one of the issues that senior citizen teachers face, as previously mentioned. Elderly teachers are forced to employ emergency online learning to stay on the job during the COVID-19 crisis. These Boomers II teachers, who were born between 1955 and 1964, use technology mostly for practical purposes and information search [3].

The delivery style suddenly shifted from face-to-face or in-person to online teaching in response to the COVID-19 epidemic and in attempts to give every learner with quality education (SDG4) [4]. The United Nations Educational, Scientific, and Cultural Organization's (UNESCO) decision to switch to online classrooms abruptly compelled academics to make the switch overnight [5]. This was especially true for senior teachers who were used to traditional teaching methods and had no choice but to follow the mandate regardless of their knowledge or experience with online learning. According to international studies, some teachers are considering changing careers, resigning, or retiring early due to the move to online programs [6].

Following the school closures and reopening delays caused by the COVID-19 epidemic, online learning became the academic world's lifeline [7]. Due to the COVID-19 crisis, the terms "emergency" online learning/"emergency eLearning" [8], "emergency remote teaching", and "emergency remote education" were coined to describe how instruction is temporarily delivered virtually through digital or online platforms and alternative means [9].

## **Get Ready To Be Techy: Struggles of Senior Citizen Teachers in the Utilization of Technology in the Classroom**

Within the context of the abovementioned premises, this study determined the struggles of the three Senior Citizen Teachers in utilizing technology in managing classroom activities of Quintong Elementary School in San Carlos City Division during the S.Y. 2021-2022.

### **OBJECTIVES OF THE STUDY**

This study aimed to determine the struggles of senior citizen teachers during the S.Y. 2021 - 2022. Specifically, it sought to answer the following questions.

1. To determine the importance of keeping up with technology as a senior citizen teacher in the academe.
2. To determine the struggles met in the utilization of technology in managing classroom activities.
3. To determine the coping mechanism of senior citizen teachers with these struggles encountered.

### **MATERIALS AND METHODS**

The study used the descriptive qualitative method as research design. Under this method, responses were gathered from the in-depth interview dealing with the importance of keeping up with technology as Senior Citizen Teachers in the Academe. The analysis using themes was employed to capture or understand the data gathered. Thematic analysis is a method of analyzing qualitative data. It is usually applied to a set of texts; such as interview transcripts. The researcher closely examines the data to identify common themes – topics, ideas, and patterns of meaning that come up repeatedly [10].

### **RESPONDENTS OF THE STUDY**

The respondents of the study were the three (3) Senior Citizen Teachers of Quintong Elementary School in the Division of San Carlos City. Using purposive sampling (Patton, 2002), respondents were purposively chosen because of the age range. Each respondent was assigned with a pseudonym to ensure the safety of their anonymity for their protection. Signing of informed consent was also facilitated.

### **RESEARCH INSTRUMENT**

The data gathered with the used of in-depth interview to identify the struggles of senior citizen teachers in the utilization of technology in the classroom. The following materials will be used in collecting the data from the interviewees; ball pen, interview guide question form and notebook. The interview session will be conducted in a conducive place wherein there is privacy and can freely talk one-on-one with the interviewer.

### **RESULTS AND DISCUSSION**

This chapter presented the findings and discussion. The purpose of this study is to describe the struggles of the senior citizen teachers in the utilization of technology in the classroom at Quintong Elementary School in the Division of San Carlos City during the school year 2021-2022. It also determined the struggles of the respondents in terms of the importance of keeping up with technology as senior citizen teachers in the academe, the struggles they met in the utilization of technology in managing classroom activities, and the senior citizen teachers' coping mechanism with these struggles encountered. Based from the findings of the study, the researcher came up with a conclusion.

The researcher, in order to have an accurate findings and discussion of the data gathered about the struggles of the respondents, she had recorded the interviews conducted. Pseudonyms were used to withhold the identity of the respondents. The shared experiences of the senior citizen teachers were categorized into three themes. Further analysis of the transcribed interviews in each theme led the researcher to classify their responses into sub-themes. The themes and sub-themes of the experiences of the senior citizen teachers who were utilizing technology in managing classroom activities were presented in the next paragraph.

Theme 1 is "Technology in Education in the New Normal". It has two sub-themes, first is "Importance of Technology in Teaching" and "Benefit of Technology to Learners". The second theme is "My Struggles as a Senior Citizen Teacher" with sub-theme "My Weak Points." The third and last theme is "Getting through the Difficulties" with two sub-themes, "Enhancing my Skills in ICT and My Support System."

#### **Theme 1: Technology in Education in the New Normal**

The transcription and interpretation of the shared experiences of the senior citizen teachers led to the formulation of the first theme and its corresponding sub-themes. The first question answers the importance of keeping up with the technology even though they are already in their senior years and its use in the academe.

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The results of the interview revealed that they have no choice when it comes to keeping up with the use of technology in their teaching. It is because of this modern world we are now living in, having laptops and be able to print reports is a must for them to comply with their work and be able to get the attention of their learners who are digital natives. The following are the testimonies of the respondents.

### Anecita:

*"I don't want to be a burden to my colleagues kaya pinilit kong aralin ang computer, lalo na lahat encoded na dapat ngayon, desktop pa nga noon ang gamit ko. Nag-enroll talaga ako sa mga nagtuturo ng computer lesson kasi ayokong maging pabigat sa mga kasama ko sa trabaho."* (I don't want to be a burden to my colleagues that is why I really insist on learning computer, especially all reports are now encoded, at first it was desktop. I even enrolled and took computer lessons because I don't want to be a burden to my co-teachers.)

Anecita took up computer lessons to keep up with the technology needed to integrate in her teaching career. She does not want to be a burden to her co-teachers that is why she persevered to learn the basic knowledge in using computer.

### Josefa:

*"Being a master teacher, sobrang dami kong trabaho. Ang dami kong reports na kailangang ipasa, dahil nagpandemic, umuso na ang pagpapasa ng report sa email, lahat encoded na dapat. Kaya importante talaga na sumabay sa kung ano ang ginagamit ngayon."* (Being a master teacher, I have so many works to do. I have so many reports that I need to pass, because of this pandemic, passing of reports now is through email, everything now should be encoded. That is the reason why I need to keep up with the technology.)

Given the position of being a master teacher, Josefa has corresponding workloads. Due to pandemic where personal submission of hard copies of reports were prohibited and sending through emails is now being used, like Anecita, she also tried to learn to send her reports through sending emails.

### Salome:

*"Hirap na hirap ako sa paggamit ng laptop ngayon sa totoo lang sa edad kong ito. Pinipilit kong aralin ang mag-encode sa laptop at magprint at gamitin ang printer. Ang trabaho kasi natin ngayon puro dapat naka-encode na at magpapasa ng report sa google drive kaya importante talaga na sumabay sa kung anong technology natin ngayon. Nahihiya na rin talaga ako na makiusap lagi sa ICT Coordinator namin."* (I found it really hard to use laptop nowadays to be honest especially in my age. I am really trying so hard to learn how to encode in the laptop and to print and use the printer. Our work nowadays is purely reports that need to be encoded and send it to google drive that is why it is important to keep up with the technology today. I'm also really embarrassed to always ask our ICT Coordinator.)

Like Anecita and Josefa, Salome also persevered to learn the basic knowledge on how to use laptop like encoding and printing reports because of the pandemic where knowing how to send emails is really a must. Salome is also like Anecita where they do not want to always bother their co-teachers that is why they tried so hard to gradually learn the use of laptop. Keeping up with technology is very important because of the increased use of technology in schools, teachers should employ technology to enhance their instructional quality and thus enhance the learning experience of students (Cuban, 2001; Desimone, 2009; Maskit, 2011).

### Sub-Theme 1: Importance of Technology in Teaching

#### Anecita:

*"Malaking tulong talaga ang technology sa pagtuturo ko ngayon kasi dati drawing ako ng drawing, gupit ako ng gupit ng mga instructional materials. Gumugupit akong mga pictures sa libro 'tapos ipapa-enlarge ko iyon sa mga xerox' an sa bayan. Pinadali ng technology ang pagtuturo at paggawa ng IM's ko ngayon."* (Technology is really a big help to me in terms of my teaching because in the past, I really spent time drawing and cutting pictures and then enlarge it to the photocopy machine in the urban area. It made my teaching and doing instructional materials very easy.)

#### Josefa:

*"Bilang senior citizen na at teacher pa, ang hirap sumunod sa trend ngayon, lalo na sa mga modern gadgets na gamit natin ngayon sa pagtuturo. Ibang iba talaga dati. Chalk, blackboard at mga charts lang ang gamit namin noon. Pero ngayon may mga tv na sa bawat classrooms, may mga videos ng lessons sa youtube na pwedeng i-download at ipanood sa mga bata."* (As a senior citizen already and as a teacher also, it is so hard for me to follow the trend today especially in using modern gadgets that we using right now in teaching. It is so different from the past where we only used chalk, blackboard and charts. But today, we have now television in every classroom, there are video lessons in the YouTube that we can download and let the learners watch it.)

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### Salome:

*“Malaki din ang naitulong ng technology sa akin bilang isang senior citizen teacher na lalo na sa paggawa ng instructional materials. Mas matrabaho kasi dati. Idrawing, gupitin, idikit, tpos ima-mount mo pa, tapos gupit ulit. Ganoon ang proseso, sobrang hirap. Kapag nabasa ay uulitin ulit yung prosesong iyon. Ngayon ay meron ng mada-download sa google na pictures tapos iprint at laminate nalang. Sobrang bilis lang ng proseso. May kamahalan nga lang ng laminating film pero mas ok na kasi pangmatagalan na kahit mabasa ay ok lang.”* (Technology helped me in some ways in my teaching especially in making instructional materials. In the past, the process is too long and exhausting. You need to draw, cut, paste it and mount it in a cardboard then cut it again. If water accidentally splash on it, it will be ruin then you need to repeat the long process again. But now, there are pictures that we can download in google, print it then just laminate it. Very easy and fast process. Even though the price of laminating films is quite expensive, it is worth the price because you can use it in a very long time because even if you splash water on it, it is water proof.)

Based on the testimonies of the three respondents, making instructional materials and even activity sheets are a lot easier today with the use of laptop, internet and printers than before. It is because with just few clicks, they can search images online and then print and laminate it. Unlike before that it is time consuming and you'll drain your energy. Pamuk (2012) demonstrated that technology helps teachers develop innovative instructional methods. Responses to such technological and classroom advances have been described as not just favorable but also timely.

### Sub-Theme 2: Benefit of Technology to Learners

#### Anecita

*“Madaling kunin ang atensyon ng mga bata ngayon kapag may nakikita silang gumagalaw or nagsasalita sa tv. Mas madali nilang maintindihan ang aralin namin kapag may napapanood silang sample video ng lesson naming lalo na sa science.”* (It is very easy to get the attention of children today when I am using technology, especially when they are seeing things that are moving or speaking in the television. It is easy for them to understand our lesson especially when they watch sample videos in our lesson in Science.)

#### Josefa:

*“Gustong gusto ng mga bata kapag nakakapanood sila ng video lessons. Mas gusto talaga nila yung may napapanood kesa sa ikaw na teacher lang ang nagsasalita. Mas tumatatak sa isip nila yung napanood nila kesa sa ineexplain kong lesson. Siguro dahil matanda na ako kaya ayaw na nila akong tignan. Hehe Pansin ko lang talaga na kapag ginamitan mo ng technology ang pagtuturo mo tulad ng mga powerpoint lessons mo na may mga gumagalaw na pictures ay gustong gusto nila at talagang nakikinig sila. Buti nalang may anak ako na gumagawa ng mga iyon.”* (Children really want to have something that they can watch like the video lessons. They really prefer to watch video lessons in the television than just listening to me. There is a high percentage that they remember something about what they had watched than retain something from me explaining the lesson. Maybe because I am old enough that is why they don't want to see me. (Laugh) I just noticed that if you integrate technology in your teaching like using powerpoint presentation with GIF's, they really pay attention to you. Thanks to my daughter who's always doing my presentation.

#### Salome:

*“Ang mga bata ngayon ay mahilig na sa mga paggamit ng computers. Kahit mga maliliit na bata alam na gumamit ng cellphone. Kaya sa pagtuturo maganda rin na gumamit ng tv na pwede silang manood ng halimbawa ng mga babasahin na abakada. Mas mag-eejoy ang mga bata at the same time ay hindi ganoong kapagod magturo ang teacher.”* (Children nowadays are fond of using computers. Even though young children already know how to use cellphone. That is why it is very good to integrate technology or use television in teaching like reading abakada in the TV. The learners will surely enjoy reading and at the same time the teacher will not be that exhausted.)

According to the three respondents, the use of technology in the teaching-learning process is very effective in terms of catching the attention of the learners while discussing their lessons. Every classroom nowadays has television where learners can watch educational videos regarding their lesson. With this, learners can expand their imagination while watching instead of just imagining the things that their teacher is just explaining. In one study, students and teachers were interviewed at a Taiwanese institution to find out how they felt about web and cloud-based implementations in the classroom (Lin & Jou, 2013). The study found that not only did technological integration help students' learning in the classroom, but it also improved support after class via networking.



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### Theme 2: My Struggles as a Senior Citizen Teacher

The second theme describes the struggles that the senior citizen teachers encountered regarding utilization of technology in managing classroom activities. The results of the interview disclosed many struggles that they have encountered while utilizing technology like poor internet connection, lack of available gadgets and even sudden power interruption in their area.

#### Anecita:

*"Nahirapan ako kapag mahina ang internet connection sa school. Hindi ako makapagdownload ng mga videos lessons ko lalo na sa science subject."* (It's very hard to have a poor internet connection here in school. I can't download video lessons especially in science subject.)

#### Josefa:

*"Struggle ko talaga ang pag-integrate ng technology sa pagtuturo ko. Hindi ko matandaan kung ano ba ang pipindutin ko sa laptop o kaya sa TV. Natatakot akong pindutin baka mali mapindot ko at masira laptop ko."* (I am really struggling on how to integrate technology in my teaching. I don't remember what to click in the laptop or in the TV. I'm afraid to just click because maybe my laptop will malfunction.)

#### Salome:

*"Dati hirap na hirap talaga ako kasi hindi ko alam kung paano gamitin ang laptop. Hindi ko alam kung ano iki-click ko. Nakikita ko yung ibang grades na may video lessons sila na pinapanood. Nakiki-copy lang ako ng mga videos sa flash drive. Ang problema ngayon ay kung paano ko ilalagay sa TV. Lagi lang ako nakikiusap sa katabi kong teacher na i-set up yung video sa TV at isang click lang para madali kong matandaan."* (In the past, I am really struggling because I don't know how to use laptop. I don't know what to click. I can see other grades that they play video lessons. I just copy it in my flash drive. My problem now is on how to play it on the TV. I always ask favor to my next-door co-teacher to set-up the video in the TV for me to just click it and I will easily remember.)

According to the testimonies of the respondents, the lack of fundamental expertise in setting up the laptop and playing video lectures on the television is the cause of the majority of the respondents' struggles when it comes to using technology to manage classroom activities. One struggle they have encountered is a lack of available gadgets for the students to use. In addition, in their barrio, where their school is located, a lack of good internet connection or no signal at all is a major issue. Additionally, Backhouse (2003) proposed that the problems of technology integration was mainly that many schools focused too much on the construction of technological equipment and networks but not on instructing teachers how to apply the technology to enhance the effectiveness of their instruction.

### Sub-theme: My Weak Points

#### Anecita:

*"Ang masasabi kong weak points ko sa paggamit ng technology in teaching-learning process ay pagdating sa mga layouting. Pero I can say na sa mga kasama kong senior citizen na rin ay masasabi ko talagang mas lamang ako kesa sa kanila pagdating sa computer. Kung basic knowledge lang naman ay marami ako alam. Mag-encode, magprint, at kahit gumamit ng Microsoft excel."* (I can say that my weak points in using technology in teaching-learning process is when it comes to layouting. But I can say that among my co-teachers who are also senior citizen, I can say that I am more capable than them when it comes to the use of computer. If it is basic knowledge then I can encode, I can print and even use Microsoft excel.)

#### Josefa:

*"Aminado akong hindi talaga ako marunong sa paggamit ng laptop. Humihingi ako lagi ng tulong sa anak ko pagdating sa mga reports ko. Kung ako pa mag-eencode ng reports ko aabutin pako ng siyam-siyam."* (I admit that I don't really know how to use laptop. I just asked favor to my daughter in doing my reports. If I am the one who will encode my reports, it will take me forever to finish.)

#### Salome:

*"My weak points ay yung nasabi ko na kanina. Dahil senior citizen nako, hirap nakong maka-absorb ng new learnings lalo na sa laptop. Hindi ko na talaga matandaan sa dami ng iki-click."* (My weak points are what I just said earlier. Because of being senior citizen already, I can't absorb too much information now especially when it comes to laptop. I can't remember what to click.)

Due to old age, the three respondents said that their weak point is obviously their poor memory where they cannot absorb too much information. Complicated apps and software information in the laptop is too much information that they cannot process and retain in their memory. Only the basics like opening the laptop and encoding in the document file is what they know.



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### Theme 3: Getting Through the Difficulties

This third and last theme discovered the people behind the scenes who are supporting and guiding the senior citizen teachers to be able to cope up with their struggles in utilizing technology. The results of the interview exposed that their children and co-teachers especially their ICT Coordinator is really a big help for them to adjust to the new normal set-up in education.

#### Anecita:

*"Pinilit ko talagang pag-aralan ang laptop. Desktop pa noon ang gamit ko nung nag-aral ako. Talagang nagtake ako ng computer lessons. Kasi sabi ko nga kanina, hate ko talaga yung umaasa sa iba."* (I really tried to learn how to use the laptop. In the past, it was desktop. I really took time to enroll in computer lessons. As I said earlier, I really hate the fact that I am just depending on other people.)

#### Josefa:

*"Thankful pa rin talaga ako sa mga kasama natin dito sa school kasi kahit papano ay tinutulungan nila ako sa pagsend ng reports ko at sa kung paano magsearch, magdownload at magprint ng instructional materials."* (I am thankful with my co-teachers here in our school because they help me in sending my reports and to search, download and print my instructional materials.)

#### Salome:

*"Pasalamat ako at mabait yung ICT Coordinator naming sa school. Bukod sa anak ko ay sya talaga ang tumutulong sa akin sa pag-edit, pag-format at pagprint ng mga instructional materials at reports ko."* (I'm thankful that our ICT Coordinator in school is kind. Aside from my daughter, she is really the one who's helping me out in editing, formatting and printing of my instructional materials and my reports.)

The collected testimonies from the three respondents were that they were able to cope with technology because of their co-teachers and knowledgeable people around and guide them.

### Sub-theme 1: Enhancing my Skills in ICT

#### Anecita:

*"Useful talaga yung pagkakaroon ng Youtube ngayon. Doon ako nanonood ng mga Do's and Don'ts. Doon ako natututo sa mga video tutorials. Lahat ng bagay pwede ng pag-aralan sa youtube."* (It is very useful to have Youtube nowadays. That is where I watch the Do's and don't's. I am learning in the video tutorials there. Everything can be learned now through Youtube.)

#### Josefa:

*"Pinag-aaralan ko one by one at tinutulungan ako ng anak ko during her free time. May notebook ako kung saan dun ko pinapasulat yung mga steps kung paano magprint at kung ano ang iki-click."* (I am continue learning one by one and my daughter is helping me in her free time. I have a notebook and my daughter write all the steps on how to print for me to know what to click.)

#### Salome:

*"Basta practice lang ako ng practice. Trying hard talaga akong matuto kasi syempre paano kapag wala yung ICT Coordinator namin or kung busy sya, ayoko naman syang lagging iniistorbo."* (I am always practicing. I am trying really hard to learn because of course what if our ICT Coordinator is not around or what if she is busy, I don't want to bother her always.)

They were able to gradually comprehend and get the hang of technology integration in their teaching by practicing every day and exploring their laptops. There is now YouTube where we can search for everything we need to know. They will quickly be able to manipulate laptops on their own if they have frequent hands-on activities with their laptop and are coached by their co-teachers or youngsters.

### Sub-theme 2: My Support System

#### Anecita:

*"At first nung hindi ko pa talaga alam gamitin ang computer, may mga anak ako na marurunong. Sa kanila ako nagpapatulong ng mga instructional materials ko na computerized. But now ako na lahat. Kaya ko na magsearch, magdownload at magprint mag-isa."* (At first, when I still don't know to use computer, I have my children that I can ask for help. It is them whom I ask favor to do my instructional materials that is computerized. But now it is only me who do all the work. I can already search, download and print on my own.)

#### Josefa:

*"Yung anak ko talaga tumutulong sakin at yung isang co-teacher ko na kasama ko sa grade 2. Sila ang laging tumutulong sakin sa pagpi-print ng mga instructional materials at mga activity sheets ko. Sila nagtuturo talaga sakin sa mga gawain na involve ang paggamit ng laptop."* (My daughter and my partner in grade 2 are the ones who are helping me. They are the one who help me in printing my instructional materials and activity sheets. They are the one who's teaching me everything that laptop is involve.)

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### Salome:

*“Our ICT Coordinator. Sya talaga ang nakakapagsalba sakin kapag may urgent report na kailangan gawin. Sa kanya ako laging nakikiusap. Nagpapaturo din ako sa kanya sa vacant time nya. Pinapasulat ko yung steps sa kung paano magprint, magdownload ng videos at kung anu-ano pa.”* (Our ICT Coordinator. She is really the one who’s saving me from those urgent reports that need to be done. I am always asking favor to her. I am asking for her help during her vacant time. I asked her to write the steps on how to print, to download videos at a lot more.)

The majority of respondents said that their family members, particularly their children (daughter, son, and grandchildren), were their go-to people for operating e-mails, encoding, and printing. They are fortunate to be guided by their younger coworkers who are also eager to teach them. In general, effective teachers are quick and positive in adapting to online learning according to study of Dolonen et al. (2020) and Tartavulea et al. (2020).

### CONCLUSIONS

1. The importance of keeping up with technology is underscored by the fact that teachers should use it to improve the quality of their instruction and, in turn, the learning experiences of their students.
2. The fundamental issue with technology integration was that too many schools concentrated on building technological infrastructure and networks rather than training teachers to use technology to improve the effectiveness of their instruction.
3. Providing assistance and words of encouragement from co-teachers and family members will truly boost the confidence of senior citizen teachers to continue learning despite their old age.

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## Perceived Roles and Challenges of Guidance Designates in the Implementation of Homeroom Guidance



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**ABSTRACT:** This study purposively investigated the perception of Guidance Designates on their primary role in the implementation of Homeroom Guidance in their respective school. The respondents of the study were Elementary Guidance Designates within Schools Division Office I Pangasinan identified through the snowball sampling technique. The responses of were gathered through an interview that delved into the perceived roles, challenges encountered, and coping mechanisms of Guidance Designates in terms of academic, personal-social, and career development domains of Homeroom Guidance. The researcher made use of the qualitative research method (allows researcher to examine people's experiences in detail, by using a set of research methods, like interviews, focus group discussions, observation, content analysis, visual methods, life histories, and biographies, Torunoğlu & Gençtanırım, 2015). For this study, the data were collected via interview. Interview is a good way to get a description of another's perspective on events (Maxwell, 2013).

The study revealed that Guidance Designate served as program manager, catering to the needs of teachers for possible technical assistance, conducting orientations, quarterly meetings with teachers, and validating the content and pedagogy of the Homeroom Guidance modules distributed. He/She may be handpicked by School Heads but must undergo proper orientation to ensure the proper implementation of Homeroom Guidance. Lack of awareness hinders the full implementation of every program, increasing awareness of teachers about Homeroom Guidance opens the way for acceptance and continuity of implementation. Work tenure results in familiarity with the job role and the ability to perform better on task. Homeroom Guidance proved to be more effective in developing learners' academic, personal-social and career development. Correct time management/scheduling of classes lessens problems with teachers' inadequacy to implement Homeroom Guidance. Self-awareness helps managers find situations in which they'll be most effective, assists with intuitive decision making, aids stress management and motivation of oneself and others.

**KEYWORDS:** Academic Development, Career Development, Guidance Designates, Homeroom Guidance and Personal-Social Development

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### INTRODUCTION

The world was stirred by the pandemic's devastating effect and every component of society has been tested to subdue its difficulty. In an instant, COVID-19 affected daily lives, enterprises, global commerce and travel patterns<sup>[1]</sup>.

The education sector was confronted with the need to shift gears to meet the challenges posed by the pandemic's consequences. This has led to the discontinuation of face-to-face instruction in schools, colleges, and institutions<sup>[2]</sup>. There is no doubt that the current situation of the educational system in the Philippines will have an impact on the fields of development of our students. Although the Department of Education has been responsive with its Basic Education Learning Continuity Plan, it is essential to support students' development of life skills that will enable them to overcome obstacles and adjust to the "new normal" brought about by the current worldwide crisis<sup>[3]</sup>.

In the Philippines, a more robust program of homeroom guidance in public schools was put in place by the Department of Education<sup>[4]</sup>. The Homeroom Guidance Program provides guided opportunities for learners during Homeroom Guidance to supplement their educational activities. Academic Development, Personal-Social Development, and Career Development are the three aspects of Homeroom Guidance. Academic Development Domain involves all of a learner's academic demands and concerns. The Personal-Social Development Domain is concerned with concerns or issues relating to learners' uniqueness (self), relationships with others, and interaction with the community. The Career Development Domain encompasses all occupational and work-

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related difficulties and issues encountered by learners. This entails the learning of skills, attitudes, and knowledge that will help students to successfully transition from school to the workplace and from job to job throughout their lives.

Homeroom Guidance shall complement the Department's objective, which is to develop holistically developed Filipinos who can understand themselves, have problem-solving skills, make wise judgments, succeed academically, plan for the future, and appreciate individual diversity. Homeroom guidance will support this effort. It envisions learners who can defend their rights and obligations as citizens of the world while working for the common good of society and their love of their nation.

Though the plan was to have the complete implementation of the Homeroom Guidance for the school year 2021-2022 accounting for the need to prepare by doing awareness campaign/orientation, capacity/team building, development of learning materials, and may more, the Department deemed it necessary to offer the new program to learners from Kindergarten to Senior High School with selected competencies that are included from Homeroom Guidance Curriculum. However, from the start of the school year 2022–2023, its full implementation, which includes the entire curriculum, policy, and learning materials, will be made available. The Homeroom Guidance is suggested to be implemented by all private schools.

In the implementation process, Class Advisers shall be assigned to implement the program with the technical assistance of the Guidance Counselor. The School Head may have a power to assign a Guidance Designate if the school lacks one, provided that he/she must be given proper training necessary for implementing Homeroom Guidance. A Guidance Counselor or Guidance Designate has the role of a program manager, ensuring the correct application of the right content and pedagogy of Homeroom Guidance in the school. He/she must conduct orientation on Homeroom Guidance at the beginning of the school year and hold quarterly meetings with Section Advisers before the implementation of the modules. As the need arises, the Guidance Counselor or Guidance Designate must be able to provide other guidance services or interventions without violating the provisions stipulated in RA 9258 The Guidance and Counseling Act of 2004<sup>[3]</sup>.

### OBJECTIVES OF THE STUDY

This study purposively investigated the perceived roles, challenges encountered, and coping mechanisms of Guidance Designates in terms of academic, personal-social, and career development domains of Homeroom Guidance in their respective schools.

### MATERIALS AND METHODS

This study purposively investigated the perception of Guidance Designates on their primary role in the implementation of Homeroom Guidance in their respective school. The researcher made use of the qualitative research method in this study. <sup>[5]</sup>A qualitative research method allows the researcher to examine people's experiences in detail, by using a set of research methods, such as interviews, focus group discussions, observation, content analysis, visual methods, life histories, and biographies. For this purpose, the data was collected via interview. <sup>[6]</sup>An interview is a good way to get a description of another's perspective on events.

### Respondents of the Study

The respondents of the study came from the Elementary Guidance Designates of Schools Division Office I Pangasinan, identified through the snowball sampling technique. The Snowball sampling technique is one of the most popular qualitative research sampling techniques, with networking and referral qualities at its core. Typically, researchers begin with a small number of initial contacts (seeds) who meet the research criteria and are invited to participate in the study. The willing participants are then asked to propose other contacts who meet the research criteria and may be willing participants, who in turn refer other possible respondents, and so on. As a result, researchers leverage their social networks to form initial connections, with sampling momentum rising as a result, catching an increasing chain of participants. <sup>[7]</sup>Sampling normally ends when a target sample size or saturation point is reached.

### Research Instrument

Data pertinent to this study were gathered through the use of semi-structured interview questions of the researcher. The interview questionnaire was designed to investigate how Guidance Designates perform their role in the implementation of Homeroom Guidance and the challenges they encounter in the performance of their role as Guidance Designates in terms of the academic, personal-social, and career development domain, as well as their coping mechanism in connection to the three, mentioned domains of Homeroom Guidance.

### RESULTS AND DISCUSSION

The researcher, to have an accurate discussion of the data gathered about how Guidance Designates perform their roles in the implementation of the Homeroom Guidance and the challenges in the performance of their roles, and how they cope with these challenges in terms of: academic; personal-social; and career development., had consolidated the responses of the respondents

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from the written interviews and follow-up interview. Fictitious names were used to withhold the identity of the respondents. The shared roles and challenges of the Guidance Designates/respondents were categorized into three themes, further analysis of the transcribed interviews in each theme led the researcher to classify their responses into sub-themes. The themes and sub-themes of the perceived roles, challenges encountered and coping mechanisms (on academic, personal-social and career development) of the Guidance Designates were presented below.

The themes generated from the shared experiences of the Guidance Designates were as follows: the first theme circled on “The Role I’m Playing”, with the sub-theme, “What is my role as a Guidance Designate?”. The second theme is “My Role, My Strategies”, with the sub-theme “Am I doing what is Expected?”. The third theme goes with “My Challenges, My Actions” with sub-themes, “Academic Domain”, “Personal-Social Domain” and “Career Domain”.

### Theme 1: The Role I’m Playing

#### Sub-Theme: What are my roles as a Guidance Designate?

The transcription and interpretation of the shared experiences of the Guidance Designate led to the formulation of the first theme and its corresponding sub-theme. The theme described how the respondents perceived their roles as Guidance Designates in the implementation of Homeroom Guidance at their respective school.

Pina Anio and Lars Larios both see themselves in the character of a content verifier and a Homeroom Guidance implementation evaluator. Whilst Happy Moya and Jem Ferrer added that as Guidance Designate it is their role to conduct a series of seminars expanding the awareness and understanding of teachers and parents on the essence of Homeroom Guidance. Conforming with the roles of a Guidance Designate <sup>[3]</sup> that they serve as program managers, ensuring the correct application of the right content and pedagogy of Homeroom Guidance in the school and must conduct orientation on Homeroom Guidance at the beginning of the school year and hold quarterly meetings with Section Advisers before the implementation of the modules. The roles of the Guidance Designates must be properly introduced to them so they can function as effectively as possible and effectively implement Homeroom Guidance in their schools. Contrary to the effortful roles of the abovementioned guidance designates Ela Cruz expressed that her role starts and ends with instructing teachers to teach homeroom guidance and monitor their distribution of printed Homeroom Guidance modules. Although Ela Cruz’s role manifests as a part of Homeroom Guidance Implementation it is deemed inconsistent and lacking. The finding of the study has verified <sup>[8]</sup> that school counselors, perceived their roles to involve counseling students on various aspects of their school life, collaborating with teachers to present guidance curriculum lessons, assisting the school principal with identification and resolving students’ issues, needs, and problems, and working with a student at a time in a therapeutic clinical mode.

### Theme 2: My Roles, My Strategies

#### Sub-Theme: Am I Doing what is Expected?

Considering the inconsistency of role performance of the respondents, the researcher included the second theme to crystalize the responses of the respondents and understand the inconsistency despite the clear guidelines cited in the Revised Implementation of Homeroom Guidance (HG) during Crisis Situation for S.Y. 2021-2022<sup>[3]</sup>. Written below was the transcription of their responses when asked about the strategies and/or roles they perform as a Guidance Designate in the implementation of Homeroom Guidance at their respective school.

In order for every program implementation to be successful, implementers or role-makers, in this case the Guidance Designates, must put their efforts, time and knowledge in the implementation. Going back to the responses of the respondents, although they are positive of the roles they are serving in the implementation, Ela Cruz expresses her thoughts and said *“kasi hindi lng Guidance (Homeroom Guidance) ang hawak ko, teacher din ako, ang dami ko pang ginagawa bukod sa HG kaya paano ako makafocused diba? So, hanggang instructing lang ako at monitoring talaga ng modules na binibigay nila, kasi may report din naman so talagang need naming imonitor. Pero sa dami talaga ng work namin hanggang doon lang kaya kong gawin, actually di naman graded ang Homeroom Guidance so need not put more effort. Tama na muna ang instruction and monitoring.”* (because I’m not only a Guidance Designate (Homeroom Guidance), I’m also a teacher, I do a lot work other than HG so how can I focus right? So, I’m just instructing and really monitoring the modules they provide, because there is also a report so we really need to monitor. But with the amount of work we do, that’s all I can do, Homeroom Guidance isn’t actually graded so there’s no need to put more effort. Instruction and monitoring are enough.) <sup>[9]</sup> Conflict on a school counselor’s (Guidance Designate) role results to difficulty in complying with the tasks expected to be carried out. To give more emphasis on the dilemma of the Guidance Designates, Jem Ferrer voiced out that although she carried out the roles of a Guidance Designate like monitoring, conducting quarterly processing of their implementation, she is hesitant as to the fact that she does not have any orientation on Homeroom



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Guidance and to put more pressure she is only a half-baked Guidance Designate since she was just assigned to be one this current school year. Same scenario of being new to the league of Guidance Designate, Happy Moya confided that she was also selected for a fact that she is a Born Again Christian and a relative of her higher up. Yes, she is positive that she does well in the performance of her roles as she coins it *“nasunod ko naman lahat ng andun na roles ng isang Guidance Designate, nakapag orientation naman ako and properly managed naman ang implementation namin kahit paano, well versed din ang mga co-teachers ko sa kanilang pagtuturo since naigaguide ko naman sila kahit medyo kulang ang knowledge ko since wala akong proper training.”* (I was able to follow all the existing roles of a Guidance Designate, I was able to orient my colleague and properly managed our implementation somehow, my co-teachers are also well versed in their teaching since I was able to guide them even though my knowledge was a bit lacking since I lack proper training). Negating to what is stated in DM-OUCI-2021-346, for schools with no Guidance Counselor, the School Head may assign a Guidance Designate but he/she should be provided with proper training specific to the implementation of Homeroom Guidance. To properly carry out her role as a Guidance designate and be kept away from role ambiguity, role ambiguity is “an incomplete sort of role sending, where the information necessary to carry out one’s job is not available or incomplete”<sup>[9]</sup>, Happy Moya and Jem Ferrer must have to undergo proper orientation on Homeroom Guidance and its implementation. Larz Larios and Pia Anio claim to have no problem in the performance of their role as Guidance Designate and they find no discrepancies in their implementation. It must have been because of the length of service they have in the public education system and as a Guidance Designate at their school. Notably speaking that work tenure (length of service) results to familiarity of job role and ability to perform better on the task<sup>[10]</sup>

### Theme 3: My Challenges, My Action

#### Sub-Theme 1: Academic Development Domain

Testimonies of the Guidance Designates who participated in this study revealed that they had encountered some challenges. The following were the transcriptions of their responses when asked about the challenges they encounter in the performance of their role in terms of the academic development domain of Homeroom Guidance and their coping mechanism.

It may seem uncritical for Pina Anio and Larz Larios to perform their role as Guidance Designates, but they still complain about their colleagues’ way of implementation. Accordingly, some of their co-teachers do not value the importance of Homeroom Guidance, especially in the academic development of their learners (*ang mahirap lang kasi minsan walang cooperation ang ibang mga teachers, pag di nila coor walang interes*). Homeroom Guidance can boost learners’ motivation to excel in their academics and improve their shortcomings as learners. The construction of Homeroom Guidance modules also improves learners’ creative and critical thinking, communication skills, and problem-solving skills<sup>[3]</sup>, since it is in a form of question application. Learners are tasked to answer each learning task with clarity and well-thought application of life skills. With this dilemma, Anio and Larz provide orientation whenever possible through the help of their school heads, they also show up in some of the online sessions of learners along with the class advisers to monitor the continuous delivery of Homeroom Guidance (*ang ginagawa ko talaga nagpapaorientation ako kasama ang School Head namin, minsan during meetings naguupdate kami ng mga nagawa na nila. We also seek any important updates on our learners’ improvement in terms of the mastery of skills from subjects to HG activities. Tapos there are times na sumasama kami ng School Head namin sa online class ng every grade level*). This strategy goes well with Ela Cruz’, she saw to it that she indulges in a problem-focused approach in dealing with her colleagues’ inadequate implementation and added that proper time management can help ensure self and others’ productivity in every endeavor. Helping class advisers arrange their schedules to inject Homeroom Guidance during online classes lessens her problems with teachers’ incapacity to implement Homeroom Guidance.<sup>[11]</sup> Proper time management and scheduling of Homeroom Guidance classes improve learners learning experiences in distance learning set-up and helped the learners foster a positive attitude, good behavior, and exceptional moral values towards their teacher. Meanwhile, Jem Ferrer and Happy Moya reported not having any problems in this domain of Homeroom Guidance. This may have a direct relation to their quarterly orientation with class advisers that their implementation is never put into hiatus and learners improved in their learning level. Jerome Bruner’s Scaffolding theory seems to work in the schools of Happy and Jem, for they added that learner develops independence in thinking, understanding, and skill acquisition, and parental and instructor support was reduced.

### Theme 3: My Challenges, My Action

#### Sub-Theme 2: Personal-Social Development Domain

Continuing to probe in the encountered challenges of the participants, Guidance Designates. The following were the transcriptions of their responses when asked about the challenges they encounter in the performance of their role in terms of the personal-social development domain of Homeroom Guidance and their coping mechanism.

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The domain of Personal-Social development is concerned with problems or matters impacting learners' sense of self, interactions with others, and participation in society. As students advance through school and into life, it provides a solid basis for their Personal-Social development. This encompasses, but is not limited to, self-awareness, coping mechanisms for emotions and stress, and intrapersonal and interpersonal abilities<sup>[3]</sup>. Since Homeroom Guidance was perceived to be more aligned with personal-social development rather than academics among the Guidance Designates interviewed, they were so positive that they do not find impending challenges for teachers do not report any unruly behaviors of their learners. Consensually responded by the respondents that, Certainly I find no problem in this domain of HG since we are all concerned with how our learners carry out themselves in terms of attitudes and moral values. Validated with the result of their Learners' Development Assessment Tool, they reported having a majority of learners under developing to sufficiently developed. This just further strengthens the claim <sup>[12]</sup> that students are likely to succeed academically and behaviorally if they have access to comprehensive guidance services and school counselors.

### Theme 3: My Challenges, My Action

#### Sub-Theme 3: Career Development Domain

Still, on the encountered challenges of the participants, Guidance Designates. The following were the transcriptions of their responses when asked about the challenges they encounter in the performance of their role in terms of the career development domain of Homeroom Guidance and their coping mechanism.

The Professional Development domain of the program reflects Ginzberg's view of career development as a lifelong process that includes early development. Homeroom Guidance promotes the early integration of career themes into students' life and assists them in determining their desired route. Contrary to Ginzberg's view, the respondents emphasize that their problem with the career development domain of Homeroom Guidance is that their learners are far from deciding on careers for themselves given that they are still young (Elementary pupils are far from choosing their careers). Although elementary learners are far from pursuing a career path, Homeroom Guidance extends their awareness involving the acquisition of skills, attitudes, and knowledge that enable them to make a successful transition from school to the world of work, and from job to job across the life span. This includes but is not limited to learners' discovery of their interests, talents, and skills, decision-making, problem-solving, planning, and exploring their career options and opportunities <sup>[3]</sup>. Aware of the construction of Homeroom Guidance and its modules, respondents encourage their colleagues to put any effort into extending the value of career development to their learners resulting in referrals to various career and Homeroom Guidance Webinars they let their colleagues' dwell on (With the availability of various webinars on HG we saw to it that our co-teachers can join and of course in return apply their take always in teaching the value of choosing careers and the early career activities which we can apply to Elementary pupils). <sup>[13]</sup> Self-awareness also helps managers find situations in which they will be most effective, assists with intuitive decision making, and aids stress management and motivation of oneself and others.

## CONCLUSION AND RECOMMENDATION

Based on the shared experiences of the Guidance Designates, the following conclusions were arrived at;

1. A Guidance Designate served as program manager, catering to the needs of teachers for possible technical assistance, conducting orientations and quarterly meetings with teachers, and validating the content and pedagogy of the Homeroom Guidance modules distributed to learners. He/She may be handpicked by School Heads but they must be given proper orientation to ensure the proper implementation of Homeroom Guidance. Lack of awareness hinders the full implementation of every program, increasing awareness of teachers about Homeroom Guidance opens the way for acceptance and continuity of implementation. And work tenure (length of service) results in familiarity with the job role and the ability to perform better on the task.
2. Homeroom Guidance proved to be more effective in developing learners' academic, personal-social and career development.
3. Correct time management or scheduling of classes lessens problems with teachers' inadequacy to implement Homeroom Guidance. Self-awareness also helps managers find situations in which they will be most effective, assists with intuitive decision making, and aids stress management and motivation of oneself and others.

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## Digital Da'wah Transformation: Cultural and Methodological Change of Islamic Communication in the Current Digital Age



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**ABSTRACT:** Modern civilisation is characterised with unprecedented technological innovations that have led to major cultural shifts. Religion remains one of the primary phenomena that has been impacted the most by the current digital revolution. Da'wah, being one of the central tenets of Islam, is no exception to this global cyberculture. In order to remain relevant and address the needs of the current Muslim community, da'wah needs to adapt to the dynamics of the current digitization of society. This article discusses the transformation of Da'wah in the age of mass media, digital communication and the internet. This research establishes how the global digital revolution has opened new avenues for da'wah with the potential to disseminate the message of Islam far and wide. But at the same time the digitization of communication and the culture that it has constructed has unprecedented ethical implications related to cyber-culture, cyber-ethics, hyperreality and mass cognitive dissonance. Thus, while it's imperative to ensure that the method of conducting da'wah must be relevant to the current era, it necessarily must conform completely to the ideals of the Quran and Sunnah.

**KEYWORDS:** culture; organization; Islamic communication; modernization; transformation of Da'wah.

### INTRODUCTION

#### *Islamic Communication: Challenges and Opportunities in the Information Age.*

The Prophet Muhammad (peace be upon him) foretold that: *"No house of brick, nor fur, will remain upon the face of the earth but that Allah will cause the message of Islam to enter it, by which the honorable will be honored and the disgraceful will be disgraced"*.<sup>1</sup>

This hadith anticipates something that can only be possible if communication and data transfer is facilitated in an unprecedented fashion. The modern era presents one of the most pertinent challenges for Muslims. From the very onset of the modern period Muslims have had to deal with several challenges such as economic wars, military invasions, onslaught of different ideologies, cross-border and geostrategic diplomatic challenges, and a growing identity crisis in the massive Muslim diaspora that spans the globe. Most of these challenges are intrinsically related to technology and its impact on humankind's culture and customs. Contemporary challenges have proved to be more sophisticated and complex than the challenges faced by previous generations. Paradigm shifting technological innovations, rise of corporate monopolies, proliferation of Artificial Intelligence (AI) and faster and more subtle forms of communication and data sharing have inevitable implications for the Islamic way of life.

Thus it is imperative for Muslim scholars and preachers to address these challenges and above all remain relevant to the times. Digitization of da'wah, therefore, has become a major necessity. In order to combat lack of information and at times even deliberate misinformation about Islam and the Prophet (pbuh), Muslim preachers need to saturate digital spaces with correct information on Islam from authentic and classical sources. The digital age presents a great opportunity for Muslims undoubtedly. Classical sources inform us how Muslims before used to travel long distances and over long periods of time just to acquire a single hadith from a scholar. The internet has turned the scales in our favour as now learning Islam has been greatly facilitated.

<sup>1</sup> Hadith of Musnad Ahmad: 23302

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## **Significant and Methods**

This article studies the transformation of methods of Islamic communication in the present era of digital disruption, especially in the shift of traditional methods to digital da'wah. In particular, this article recommends digital da'wah as adaptive efforts of Islamic communication to address contemporary challenges. A practical reference is provided for various people interested in sociological dynamics stemming out from shifts in communication, along with providing a comprehensive guide to da'wah practitioners and academics regarding the importance of adapting to the current trends in communication, thereby using these developments to the advantage of Islam.

This article uses the literature study method and establishes how a global cultural shift in the Muslim world from classical methods of communication to technologically advanced methods will help address the challenges in the era of computerization of communication and will aid and reinforce da'wah efforts by making them more efficient and relevant to the times at hand.

## **DISCUSSION**

### **Cultural and Methodological Change of Islamic Communication in the Digital Age**

Modernization followed by its later stages of the global digital and information age is a cultural shift that includes several conceptualizations and ideologies. Millions of people worldwide are witnessing the revolutionary transformation of their daily lives. Contemporary sociologists use the term modernization to describe how developing countries move from traditional or less developed institutions to having characteristics of more technologically advanced societies. Modernization is defined as a positive movement and a developmental change. Marsh<sup>2</sup> stated that modernization in this digital era could no longer be explained within the original theory. Instead, they modernization in this modern era, creatively extended in new directions that could account for the anomalies, using such concepts as reflexive modernization, first and second modernity, ecological modernization, evolutionary theory, values modernization, multiple modernities, and global modernity. Thus, modernization is a process when a community renews itself and tries to get the characteristics of an advanced society.

### **Modernization and Global Socio-Cultural Changes**

Modernization cannot be separated from globalization, where cultural ideas easily spread worldwide, leading to a universal culture or monoculture that impacts all facets of human existence. Consequently, modernization leads to seismic changes in social and economic conditions. Developments in telecommunications and technology are pivotal to help change a society's social and cultural conditions. Developments in telecommunication technology are directly proportional to a society's cultural advancement. Thus the more reduction in distance between individuals, the faster the communication and the greater the transfer of science and technology.

Cultural changes resulting from modernization are inevitable, especially in communication, including religious communication. Rejecting and avoiding modernization and globalization is tantamount to dismissing the relevance of religious messages in the context of modern society. The Quran establishes itself as the guide for humanity till the end of time.<sup>3</sup> This entails the relevance of the message of Islam to be uncompromisingly relevant and critical for humanity's salvation even in the current age of globalization. Failure of Muslim preachers to utilize modern technology in the service of Islam, will have irreparable negative effects for the global Muslim community.

Evolutionist Sociology considers modernization the cultural transformation of society into a technologically saturated one. Modernization is a cultural phenomenon that began from the internationalization of traditional associations into a community with a new model that emphasizes technology and cultural exchange.<sup>4</sup> Modernization includes a social transformation of traditional or pre-modern nature based lifestyles into a technologically engineered lifestyle.

Mechanization, mass media, and the evolution of communication technology has changed social behavior patterns of all communities, including Muslims. The breakdown of large traditional family units to nuclear and single parent households is an outcome of the globalized monoculture. The advent of the internet and the ease of internet access have caused major socio-cultural shifts. These shifts greatly influenced thought, values, and cultures, consequently impacting many aspects of people's lives, including their religious faith.

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<sup>2</sup>Marsh, Robert M. "Modernization Theory, Then and Now." (Comparative Sociology 13 (3), 2014: 261–83). <https://doi.org/10.1163/15691330-12341311>.

<sup>3</sup>Al-Qur'an Translation Completion Team (2016-2019). "The Qur'an and its translation. 2008". (Jakarta: Lajnah Pentashihan Mushaf Al-Qur'an, 2019).

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With the beginning of the internet era, Muslims have entered a period of "interactive silence" where individuals have achieved arbitrary freedom and autonomy in expressing their views. This autonomy has affected basic etiquettes of engagement. Increasingly advanced technology has eliminated time and space limits so that da'wah, one of the core Islamic tenets, that was traditionally a person to person spiritual interaction can now be done through electronic interfaces.<sup>5</sup> While dissemination of Islamic messages through digital web based platforms allows the message of Islam to have a global reach, but how can the practice of da'wah be made more efficient, all the while meeting the demands and needs of the growing Muslim Ummah

### Modernization: Communication Methods Change

Cultural modernization leads to a wide spectrum transformation in values, norms, and attitudes in which societies find themselves. For example, globalization has led to great innovations in communication, transportation, politics and economics. Modernization has impacted mindsets and behaviors as well. Essentially modernization encompasses a total transformation of traditional shared life into an economically practical pattern juxtaposed with technological innovations.

In changing mindsets, modernization has popularized a highly materialistic and physicalist approach which is hyper-rational and antithetical to metaphysics and spirituality. According to Comte<sup>6</sup>, "In the era of modernization, human thought gets rid of what he terms 'myths, abstract beliefs, superstitious, and the mystical', or all of which are opposed to common sense". Therefore, modern society gives precedence to material realm and the physical world. This dramatic change in mindset is a great epistemological challenge for preachers, especially on how to apply effective da'wah methods to be relevant to the current trends favouring reason over revelation. In addition to providing effective da'wah that appeals to both the rationality and spirituality of people, a preacher must also understand these seismic shifts in culture and society. Rapid growth and easy access to the internet increases the number of internet users from year to year.

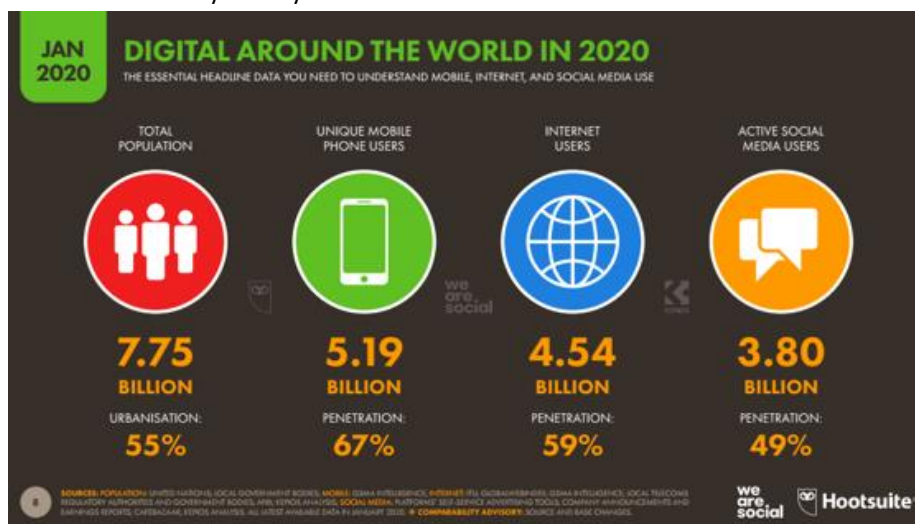


Figure 1. The Number of Internet Users in the World<sup>7</sup>

The development of the internet led to the proliferating development of social media, with smart phones and tablets facilitating its global reach. The development of internet technology, social media, and smartphones enables global communication. Before modernization, da'wah was interpersonal communication. Then with the advent of the printing press, Islamic scholarship adopted it and Islamic literature reached far and wide. It is even argued that Muslims were using a proto printing press centuries before Gutenberg. In the twentieth century da'wah utilized the medium of television and radio channels.

However, since the last decade Digital Da'wah that utilizes platforms such as social media, computer applications and websites has helped bring benefit to diverse audiences.

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## Digital Da'wah Transformation

### **Da'wah: Communicating Islamic Messages**

Da'wah etymologically denotes 'a call or invitation'. Thus it is a call to the truth of Islam.<sup>8</sup> The Prophet Muhammad (pbuh) said, "The religion (of Islam) is good advise." (Sahih Muslim). The Qur'an encourages every Muslim, male or female, to become a dā'i/dai'yah (caller to Islam). A Da'iyah's behavior, speech, and thought process must completely represent the message of Islam and invite people towards ethical behavior (yad'ūn ilā 'l-khayr) to serve the Creator. Prophet Muḥammad (peace be upon him), according to the Qur'an, was the one who called people towards good and warned of the consequences of rejecting khayr, ḥaqq, and ma'rūf. The Qur'an, in some places, outlines how to spread the message of Islam.<sup>9</sup>

From a language point of view, the word da'wah comes from the Arabic word which means calling, asking, guiding or calling, inviting others to follow, join, and understand.<sup>10</sup> In an integralist sense, da'wah is an ongoing process conducted by the bearer of da'wah to gradually bring the recipient towards Islam.<sup>11</sup> The concept of da'wah can be understood as an attempt to introduce, teach, and convey religious beliefs to other people or groups. Historically, Islam spread throughout the world by da'wah.<sup>12</sup>

Methodologically, da'wah should be delivered using the best communication techniques, skills and etiquettes (maw'izah al-ḥasanah). This method includes building a logical and rational discourse, including the use of appropriate media for delivery. Da'wah must necessarily conform to the specific conditions and requirements of the receiving audience.<sup>13</sup> The behavior and practices of Allah's Apostle are examples and references to understand the basics of da'wah. When the Prophet Muhammad (pbuh) initiated his da'wah efforts, he addressed the prevalent socio-religious issues in the Meccan society. According to 'Abd al-Karim Zaidan,<sup>14</sup> the da'wah method must also deal with the question of how to overcome obstacles in preaching.

In delivering their da'wah, a preacher must know the problems and challenges that the Prophets and Apostles faced in their time and how they responded to those challenges. Thus, it becomes crucial to understand contemporary challenges and think of appropriate da'wah strategies and methods. Da'wah is an essential communal activity in Islam as through it the very existence of Islam as a way of life is safe guarded.

### **Da'wah Methods**

Before modernization, the da'wah method focused on the compilation and delivery of content which was based on the Quran and Sunnah. This method is commonly referred to as the Mau'izhah Hasanah method.<sup>15</sup> Mau'izhah Hasanah can be interpreted as sound advice, education, teaching, imparting good news or warnings, and lastly moral rectification using the medium of storytelling, with a view to ensure the ultimate salvation of the individual.<sup>16</sup>

Mau'izah Hasanah comprises several ways of conveying Islamic messages: spoken language, writing, and serving as role-models.<sup>17</sup> Three elements must be fulfilled in this method. First, mau'izah Hashanah must contain sound advice. Second, guidance should be delivered in an affectionate and sincere manner with no ulterior motive or demand for recompense in mind. Third, the language must not be critical, harsh or insulting, thereby making the person(s) uncomfortable.

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<sup>8</sup>Saputra, Eko Hendro, M. Bahri Ghazali, Hasan Mukmin, Bambang Budi Wiranto, and Fitri Yanti. "Understanding da'wah and khatib." (Linguistics and Culture Review 5, no. S1 (2021): 274-283).

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<sup>11</sup>Nur, Makmur Jaya. "Da'wah in Form of Ukhuwah Islamiyah." (In 1st Borobudur International Symposium on Humanities, Economics and Social Sciences (BIS-HESS 2019), pp. 941-946. Atlantis Press, 2020).

<sup>12</sup>Ibid  
<sup>13</sup>Kusnawan, Aep. "Preaching in the Technological Society." (Science of Da'wah: Academic Journal for Homiletic Studies 10, no. 2 (2016): 355-374).

<sup>14</sup>Nur, Makmur Jaya. "Da'wah in Form of Ukhuwah Islamiyah." (In 1st Borobudur International Symposium on Humanities, Economics and Social Sciences (BIS-HESS 2019), pp. 941-946. Atlantis Press, 2020).

<sup>15</sup>Hezbollah, Muhammad. "The Concept of Mau'izhah Hasanah in the Qur'an." (Bachelor's Thesis, Faculty of Da'wah and Communication Sciences Syarif Hidayatullah State Islamic University Jakarta 1437 H/2016 M, 2014).

<sup>16</sup>Ibid  
<sup>17</sup>Kamarudin, Muhammad Aiman, Mustafa Kamal, Muhamad Syakir, And Jimain Safar. "Social Media And Da'wah According To Islam." (In Working Paper Outlined At The Science Technology And Human Seminar, 2019)

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Modernization presents many opportunities on the one hand but even challenges, and obstacles in delivering da'wah. Therefore, da'wah in the twenty-first century needs to be customized to the needs and requirements of the globalized culture. There is a tendency within traditional Muslim scholarship to be reluctant to adapt to innovations. On the contrary we find the Prophet (pbuh) was open to adopting new techniques if they were beneficial to the cause of Islam even if they came from foreign sources. This can be seen when Salman al Farisi suggested the use of trenches as a military tactic in the Battle of Khandaq. The second rightly guided Caliph Umar (ra) commissioned the installment of windmills to grind grains in the outskirts of medina, when he saw this technology in the Persian military campaigns. Muslims made significant advances in astronomy, geography and incorporated foreign knowledge in order to serve Islam.

### Digital Dakwah Transformastion

As discussed before the digital global revolution has brought about great paradigm shifts in communication practices. By 2020, the world's internet users will have reached 4.5 billion people. Meanwhile, social media users worldwide are more than 90% of total internet users. That is, almost all internet users have social media accounts. Users access their accounts for an average of about 2 hours, and as many as 74% access their accounts through smartphones. Globally, social media has become an integral part of communication, business and learning. On September 21, 2020, Digital Insights stated that the number of social media users such as Facebook had reached 1.3 billion. In less than four months, precisely by the end of January 2021, active users of this social network reached 1.33 billion.<sup>18</sup>

Thus, da'wah must utilize this growing proliferation and power of social media in order to spread awareness about Islam.. The exponential growth of WhatsApp, Facebook, Twitter, YouTube, and Tiktok <sup>19</sup> to serve da'wah efforts is a much needed necessity.

The ability of social media to carry out conventional mass media functions with features that allow interactional communication, makes social media the most suitable medium to convey da'wah and reach out to more people. Muslim IT experts must be incorporated in such efforts to help preachers grow their social media handles. This technology uses very specific algorithms that enable users to reach specific audiences based on their locations, or interests.

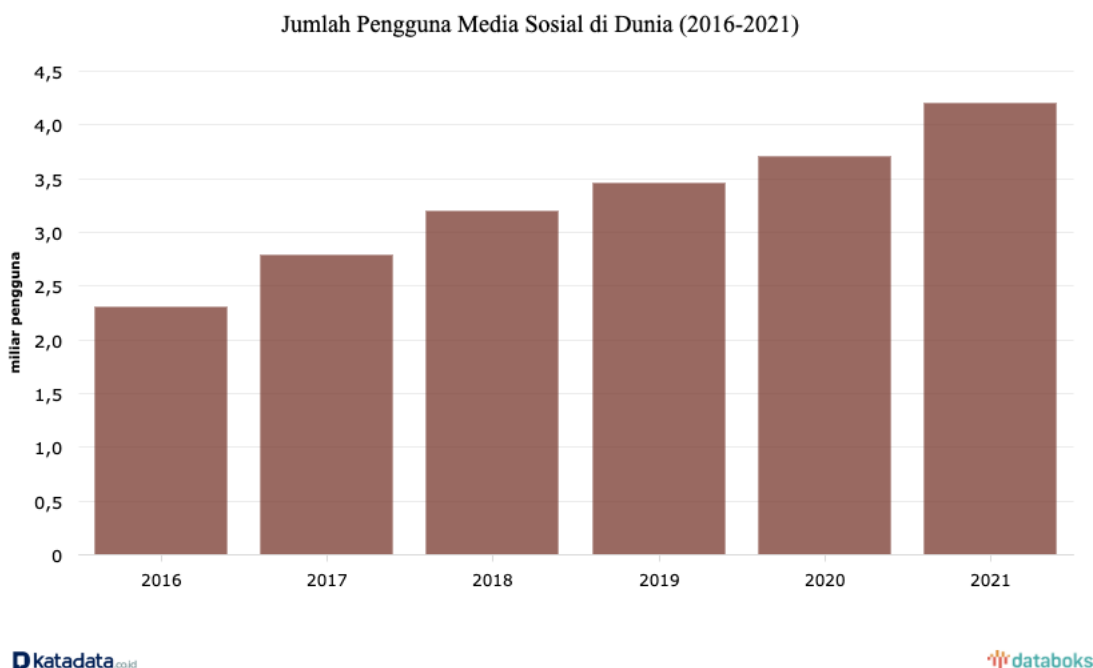


Figure 1. Social Media Users in Cyberspace <sup>20</sup>

<sup>18</sup> Ibid

<sup>19</sup> This Data User Internet In Entire World Year 2020 | by Good Ramadan | TECHNOIA - Data Dan Inspiration To Action" n.d. Accessed December 27, 2021. <https://teknioia.com/data-pengguna-internet-dunia-ac03abc7476>.

<sup>20</sup> The Number of Social Media Users in the World Reaches 4.2 Billion | Databox." n.d. Accessed December 27, 2021. <https://databoks.katadata.co.id/datapublish/2021/02/18/sum-user-media-social-di-dunia-reach-42-miliar>.



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Thus preachers must be educated in the best practices of using social media for da'wah. Creative content in the form of infographics, short videos, quotes and status updates facilitate Islamic awareness for lay audiences.

Preachers can readily evaluate the effectiveness of the information they share through feedback, comments and reactions which are not available in conventional media. The information shared on social media will be direct and easily accessible to anyone. Digital Da'wah through social media has been going on since the emergence of digital propagation that developed along with the development of information technology. The presence of many Islamic Da'wah sites such as MyQuran.com, Quran.com, Sunnah.com, Ukhuwah, MoslemWorld.co.id, IndoHalal.com and other Da'wah websites have millions of site visits.

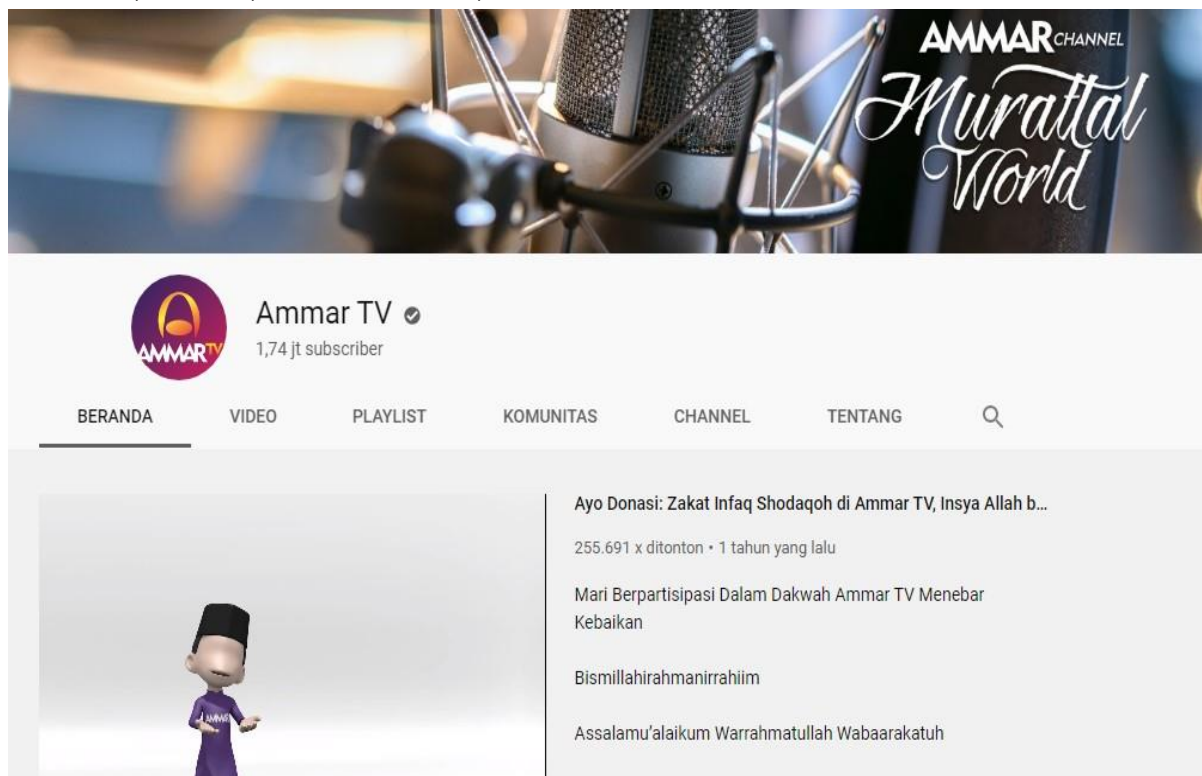


Figure 2. Dakwah on Youtube "Ammar TV"

However, recent events shed light on how the internal algorithm of social media especially Facebook is an effective tool at manipulating political opinions and even various scientific studies show how social media instills low self esteem, negative self image and even leads to depression in users. Additionally, while social media can be an effective tool for da'wah, it is also open to many unethical and immoral online spaces. Keeping these negative effects of social media in mind, efforts need to be made in the Muslim world to sponsor Muslim web developers in creating Muslim social media websites. These would be designed based on Islamic ethical frameworks with a prime focus on facilitating Muslim unity and da'wah.

The digital da'wah transformation needs to take place from the grass roots i.e. from the madrasa and Islamic institute level where Islamic studies students should be trained by IT professionals on how to effectively use digital technologies in da'wah.

Recent debates on net neutrality have revealed how popular search engines favour certain corporate and political narratives. Moreover, the ongoing concentration of media by virtue of which most media content is owned by a few corporations is a dangerous trend as it serves a very specific agenda and censors all content which is at odds with the global corporate interests. Thus da'wah practitioners must be educated on how to make use of SEO (search engine optimization) to ensure their content gets more visibility on the internet. Also there is a growing vacuum for Muslim centered video sharing platforms that compete with Youtube and Vimeo. Youtube hosts billions of videos and most of that video content is antithetical to Islamic ethos. Thus Islamic institutes need to garner efforts and collaborate with state and private agencies to develop Islam compliant video hosting websites, search engines and social media platforms.

The current entertainment industry is a billion dollar global industry. This has impacted the psyche, perspectives and lifestyle choices of Muslims worldwide. Innovations in da'wah practices must include creating subtle and entertaining forms of da'wah for young Muslim audiences. The success of Turkish series Ertugrul has uncovered the latent interest among young Muslims to learn Islamic history. Infact, historical documentaries serve as effective soft power for nations. Muslim preachers must also campaign for high quality Islamic media including historical series on the Prophet's seerah, the early generations of Muslims

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or important Muslim role models, events and movements. For example, a high quality series on how Islam entered Indonesia. Such series must showcase Islamic ethics and ideals. Scientific research shows how audio-visual content is retained the most in human memory. These scientific findings must be utilized by preachers to develop e-learning platforms and other technologies and databases for da'wah purposes.

Preparing the next generation of Muslims must be the core focus of Muslim scholars. Children today are exposed to violence and obscenity via video games and cartoons. Islam based educational video games, computer applications and animations need to be developed for Muslim children. Efforts to translate and upload on the internet all Islamic literature and needs to be undertaken by Islamic institutes. All Islamic universities must have online accredited courses as well as host webinars with international scholars.

### **Muslim Cyberspace and the Islamic Digital Revolution**

The transformation of da'wah through social media, easily accessible through digital devices, shows that a new era of information and communication technology (ICT) has changed all aspects of life, including religious life. Social relationships no longer take place face-to-face in the truest sense. Thus the digitization of da'wah is a much needed endeavour that needs to be undertaken by Muslim intellectuals from varied spectra.

The global cyber space has the potential to unify diverse Muslim communities. Allah says in the Quran Surah Al-Anfal:73 ; *"And those who disbelieve are allies to one another, (and) if you (Muslims of the whole world collectively) do not do so, there will be fitnah (corruption and tribulation) on earth."*<sup>21</sup>

The cyberculture have provided us with a great opportunity to build international collaborations between Muslims of different communities and different strata of societies like scholars, scientists, philosophers, artists, economists, activists etc. Failure to establish these alliances and collaborative efforts has led to a widespread moral breakdown.

The complete digitalization of da'wah will be accomplished in broadly three phases. Firstly, Muslim academics and scholars need to populate the web space with Islamic content. This would create a formidable online Muslim community and showcase a strong Muslim presence on the internet. Currently we are in the middle of the first phase. The second phase would commence when independent Muslim platforms like Islam-compliant social media websites, search engines and video hosting platforms emerge. This would be an ummah wide collaborative effort requiring private and public sector investments, top brass of Muslim IT experts and Muslim religious scholars and philosophers. This phase would serve as a mass migration of online Muslim community to sharia-compliant web alternatives. The third phase would commence when the Muslim worldwide web community with its indigenous online platforms would compete and even replace the billion dollar Internet giants of today, as better, more efficient and ethical alternatives. This would inevitably herald an Islamic digital golden age. The Muslim world is 1.7 billion strong and possesses the human resources, the technical know-how and the financial resources to accomplish this.

### **Digital Da'wah: Cyberculture, Hyperreality, and Moral Challenges**

Digital da'wah, with its mission to disseminate the message of Islam and its values in cyberspace, will inevitably struggle with the negative repercussions of this novel culture. Initially, da'wah must be in conjunction with the prevalent social, economic, and cultural context. But the ultimate goal of all Islamic da'wah is the establishment of Islamic institutions and agencies that are conducive to the growth and welfare of all people. Digital da'wah will also need to address and tackle with the dynamics of the virtual world and the ethical conundrums of the technological revolution.<sup>22</sup> Social media and the internet has created a virtual space for people to share ideas called cyberspace. We have argued in the article that it is imperative for Muslim preachers to utilize this opportunity to create effective and efficient da'wah methods.<sup>23</sup>

However, like other communication media, digital media certainly also has some negative impacts. One of them is a new culture, better known as cyberculture. Islamic communication (da'wah), which has a vision and message directed to the divine, must be supported by a virtual culture that adheres to Islamic values and ethics. Islam has been sent as a mercy to humanity. Whatever is influenced by Islam and its values receives a part of that mercy. The current cyberculture accentuates the prevalent nihilistic and narcissistic mindsets of the post modernist age. These trends are increasingly being syphoned into the young masses around the globe by means of media personalities, social media influencers, films and advertising. Thus, for Islamic da'wah to

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<sup>21</sup>Al-Qur'an Translation Completion Team (2016-2019). *"The Qur'an and its translation"*. (Jakarta: Lajnah Pentashihan Mushaf Al-Qur'an, 2019).

<sup>22</sup>Abdul Ghofur.2019, *Da'wah Islam in the Era Millennial*. (Dakwatuna: Journal Da'wah and Communication Islam

<sup>23</sup>Rio Febriannur Rachman. *Optimization Media Digital Based Good People deep Program Hero Economics* (Surabaya: Iqtishoduna: Journal Economics Islam,8, 273-292, 2019)

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achieve its goals, it has to turn the tide in its favour and reverse the negative trends into positive ones as established by the Quran and Hadith. Cyberculture is essentially a virtual phenomenon and exists subjectively in the minds of people worldwide.<sup>24</sup> The narrative that benefits a few powerful corporations is trickled down from every virtual space giving the illusion of a consensus. That is precisely what makes this phenomenon a difficult challenge as people's thought process and critical thinking skills have been sabotaged. The Quran warns us about how the majority lifestyle of people is not rightly guided. With the advent of media and the internet the corrupt lifestyle has proliferated globally. The critical role of Digital Da'wah then would be to create a global awakening from this virtual reality that invades their mind spaces.

The Prophet (pbuh) warned "(in the last age) there will be times of great confusion when the truthful is rejected and the liar is believed." (Musnad Ahmed) Increasing indulgence of people in the virtual cyberculture has created what is called hyperreality. Hyperreality is the inability of people to distinguish reality from a simulation or virtual construction of reality especially in technologically advanced societies like ours.<sup>25</sup> Contemporary media including news outlets, films and radio have diminished faculties of independent and critical thought by constant yet subtle indoctrination with a materialistic, consumerist and narcissistic worldview.

Digital da'wah has the duty to promote and teach critical thinking skills in a world of hyperreality. While the emphasis of hyperreality is on building a positive 'virtual' profile of a person. The message of Islam emphasizes on the inner and spiritual rectification for a global change. These opposing motives present a great challenge for the project of Digital Da'wah.

Another challenge for online Da'wah activities is that it may reduce interpersonal interaction, causing excessive addiction to digital devices and vulnerability to ethical problems. In the end, this can create a new culture in the Muslim society characterized by a lack of interpersonal interaction and over indulgence in social media. The daily usage of social media is on the rise globally as it becomes the ground for entertainment, work and news.

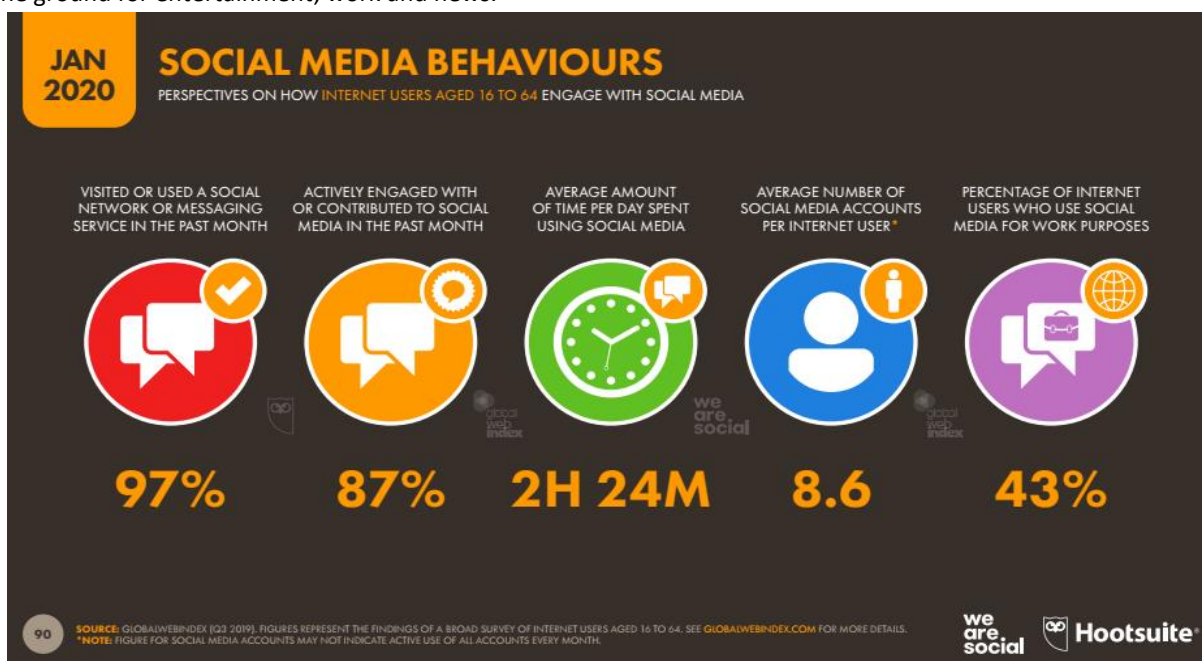


Figure 3. Social Media Users Behaviour<sup>26</sup>

The question to be addressed would be how Digital Da'wah can utilize cyberspace to bring about a global positive change, all the while keeping itself secure from the socio-ethical pitfalls of cyberculture. Undoubtedly, the utilization of modern technology for the service of Islam is undisputed. One issue that needs emphasis is that the purpose of digital da'wah must not be to perpetuate and sustain the use of social media and other technology that impact society negatively. But the main focus must be

<sup>24</sup>Rio Febriannur Rachman. *Optimization Media Digital Based Good People deep Program Hero Economics* (Surabaya: Iqtishoduna: Journal Economics Islam,8, 273-292, 2019)

<sup>25</sup>Mark Poster. "Introduction." Mark Poster (ed.). Jean Baudrillard: Selected Writings. Downloaded from <http://www.humanities.uci.edu/mposter/books/Baudrillard,%20Jean%20-%20Selected%20Writings.ok.pdf> at 22. June 2020.

<sup>26</sup>The Number of Social Media Users in the World Reaches 4.2 Billion | Databox." n.d. Accessed December 27, 2021. <https://databoks.katadata.co.id/datapublish/2021/02/18/sum-user-media-social-di-dunia-reach-42-miliar>

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to direct Muslims to Islamically compliant alternatives and wean them off unproductive platforms that serve to indoctrinate rather than educate.

The Quran emphatically declares that "Allah is the one who sent down the sent His Messenger with guidance and the religion of truth to manifest it over all ways of life (deen), although those who disbelieve dislike it." (Q 61:9). Thus we are given a divine assurance that Islam will supercede all rival lifestyles including the present cyber-materialistic-consumerist monoculture that has taken hold of the world. Thus, acceleration of da'wah activities on all available media utilizing current technologies is a religious obligation over the Ummah.

Understanding the true meaning of religion as a way of life will be able to raise awareness in religious communities to be able to respect each other's way of life.<sup>27</sup>

### E. CONCLUSION

Modern civilization has led to serious transformations in various aspects of life, including the transformation of da'wah, from traditional methods to more modern methods by utilizing the potential of technology as a tool and medium for delivering the message of Islam. In Islamic communication, da'wah has changed from a method that focuses on the content and delivery to a process that also prioritizes suitable media and technology to disseminate information on Islam to a broader audience worldwide. With the current computerization and automation of media and communication new ethical dilemmas must be addressed by Muslim intellectuals. Da'wah can be revolutionized by the medium of modern technology, internet and social media. However, digital da'wah also evokes various ethical and moral challenges, all associated with the unprecedented influence that cyberculture exerts on our civilization. While it's imperative to ensure that the method of conducting da'wah must be relevant to the current era, it also must conform completely to the ideals of the Quran and Sunnah.

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## Social Construction: Media, Hijab and Students Identity

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**ABSTRACT:** The background of this research is to uncover a variety of ways and models of wearing the hijab in Muslim student communities at the University of Lampung. The development of this hijab model developed in accordance with the development of fashion. The use of hijab with a variety of models is motivated by several factors including: understanding, beliefs, friendship and the media they use. From this understanding, the theory used is the theory of social construction from Peter Berger. Understanding is obtained from friends, religious discussions, from efforts to read or study religious books, family environment, or media exposure. The research method uses a qualitative approach with in-depth interviews, interviews with 100 students from 8 faculties at the University of Lampung. The jilbab usage model is generally divided into three categories. The first is a small headscarf (completely covers the head and neck), the second is a medium-sized headscarf (cloth covering to the chest), third is a veil covering the chest to the stomach even more. The jilbab usage model is much influenced by the media they use, for example Instagram or Twitter. The use of the jilbab then settles in the process of community life and then crystallizes into the student's identity.

**KEYWORDS:** Hijab, Identity, Crystallization, Society, media

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### I. INTRODUCTION

In general, Indonesian people say that the head coverings used by Muslim women are hijabs, headscarves, and *jilbab*. In this paper, we use the word hijab as a head covering used by Muslim women. Many Indonesian women wear the hijab, because the rules for wearing the hijab are regulated in the Al Quran. However, the use of the hijab is influenced by perceptions for its users. This can be seen from the size of the hijab used, some are small, medium, some are even very wide. Place, time, age a woman also affects the hijab model used. For example, during the fasting month, many women suddenly wear the hijab. After the fasting month is over, the hijab is often not used anymore. Likewise in the religious court office when women are facing certain cases. So women wear hijab, then the question arises, What's with the hijab?, sometimes the hijab is an individual identity or a community identity.

For example, during the fasting month, many women suddenly wear the hijab. After the fasting month is over, the hijab is often not used anymore. Likewise in the religious court office when women are facing certain cases. So women wear headscarves, then the question arises, What's with the hijab?, sometimes the hijab is an individual identity or a community identity.

The use of the hijab can be studied from various aspects, such as media, economics, social, self-esteem, motivation, motives, fashion, identity, the impact/influence of hijab users, studies of use in the Qur'an and hadith, the use of hijab in certain countries or communities, even the use of headscarves for a non-Muslim woman. Ansor, M., & Meutia, C. I. (2016). The use of hijab is not only obtained from the media, it could be that the concept of using the hijab is obtained from people around us such as parents, friends, girlfriends, teachers, lecturers and others. This research flows along with the meanings that exist in the minds of the students themselves.

The media influence the daily life of Indonesian people, including the hijab models used. Mas'uda, D. (2018) explained that social media has become a new construction space for women's appearance to be considered fashionable. The media also influences the construction of meaning for Muslim women to interpret their identity. This article reveals the models of wearing the hijab by Muslim female students at the University of Lampung. Behind these hijab models, it is assumed that the media plays a role and develops at this time as well as the identity of its users.

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The dress appearance of Muslim female students at the University of Lampung is as follows: 1. Wearing clothes with a hijab complete with tops and bottoms (skirts or trousers). 2. Using full clothes without wearing a hijab. The use of hijab is divided into three, namely: large-sized hijab, medium-sized hijab, and small-sized headscarves (field observation data for 2017-2022).

In another study, the types of hijab used by students consisted of the wide hijab, semi hijab and *slang* hijab, they chose to use the hijab based on their motivation and belief that the hijab was a symbol of Islam. Ahmadi, D., & Yohana, N. (2007). The use of this hijab model raises several questions. Why is that?, is it more appropriate to use the hijab model that is used according to Allah's commands, or does the use of the hijab follow the latest fashion trends from social media? When we look at the use of the hijab around the world today, the models and patterns are very diverse, because the use of the hijab is an expression of the user, the message and the meaning in it. The meaning in the student's mind. Regarding the meaning of the use of the hijab for Muslim students at the University of Lampung, it is an interpretation in the community, the meaning of the use of the hijab is through interpretation. As civilizations have different interpretations and appreciations like people in Indonesia. Suhendra, A. (2016).

The development of the media is very rapid, as well as its content, developing according to the needs needed by humans today. The content of the use of the hijab is something that is very developed in the media. Either social media or other media. This content can be studied from various disciplines, including the study of media economics.

Cunado and Perez explain that the media has a huge impact on people's lives, both in positive and negative impacts. The positive impact of watching television, listening to the radio, reading newspapers and using the internet is happiness or pleasure in life. (Cunado, Juncal & Perez, Fernando de Gracia. 2012). The study discusses: 1. How is the description of the hijab wearing model 2. What is the concept of the meaning of hijab according to students?, 3 How is the concept of the relation between hijab and media?, 4. How does the concept of media create identity for students?

## II. THEORETICAL FRAMEWORKS

### Study of Social Construction of Reality

Everyday reality can be constructed by the media. Process of Externalization, objectification and internalization. These media exposures are integrated into people's daily culture, this is the social construction of reality. Santoso, P. (2016). Further examples related to this theory are *Republika* media and *Kompas* in packaging news, which were carried out by Muslims on November 4 and December 2, 2016. Although the theme is the same, the method of delivering the news is different. when there is a difference in the delivery of the message, the message can change its meaning to the person who receives it. *Republika* presented news about how all government agencies were involved in securing the action. The compass presented the police and TNI in guarding the action. Mayasari, S. (2017). Several other studies, among others, are Nursalam, N., & Arifin, J. (2016), explaining that Instagram media affects a person's friendship behavior, it can make a person tend to prioritize the interests of virtual world life rather than the real life of the social world. According to this theory, reality is the result of creative human creation through the power of social construction on the social world around it.

Berger and Luckmann say that: Social reality consists of three kinds, namely objective, symbolic and subjective reality. Objective reality is formed from experience in the objective world that is outside the individual and that reality is considered a reality. Symbolic reality is a symbolic expression of objective reality in various forms. While subjective reality is a reality that is formed as a process of re-absorption of objective and symbolic reality into the individual through the process of internalization. (Sukidin. 2002: 195)

Society is an objective reality based on an institutionalization process built on habit (habitualization). "It is important to keep in mind that the objectivity of the institutional world, however massive it may appear to the individual, is humanly produced, constructed objectivity" (Berger and Luckmann. 1997: 33). power may appear to the individual, whether produced humanly, built on objectivity. There are 4 main elements in this theory. 1) Attention to actors. 2) Focusing on the important or essential facts and on a natural or natural attitude. 3) Focus on micro-problems. It means studying the process of forming and maintaining social relations at the level of face-to-face interaction in order to understand them in relation to certain situations. 4) Pay attention to growth, change and action processes.

Phenomenon to understand how order in society is created and maintained in daily interactions. The norms and rules that control human action as a social structure are judged as the result of the actor's interpretation of the events he experiences. Humans are not passive containers as a place to store and preserve norms. 1) Stage of preparing construction materials 2) Stage of distribution of construction 3) Stage of construction formation 4) Stage of confirmation Community objectification is a human product, rooted in the phenomenon of externalization.

Human products (including their own world), then are outside themselves, confronting the products as facticities that exist outside of themselves. Even though all cultural products originate from (rooted in) human consciousness, the products do not

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necessarily get reabsorbed into consciousness. Culture is outside of human subjectivity and becomes its own world. Internalization is a direct individual understanding or interpretation of objective events as meaning disclosure. Externalization is strongly influenced by the collection of common sense knowledge or stock of knowledge of students where the stock of knowledge is a form of accumulation of common sense knowledge or common sense of knowledge.

### III. METHODOLOGY

This study uses an interpretive paradigm. The findings are a description of the symptoms in the identified community. The interpretive paradigm is more subjective, the findings are a description of the symptoms identified in the field, and cannot be generalized to the entire population. The data sources use primary data sources and secondary data sources, namely data that are not directly related to research subjects such as documents. The selection of data sources is based on research needs.

The sample of this study used a purposive technique. The research informants were 100 (one hundred) Lampung University students consisting of eight faculties, namely: Faculty of Teacher Training and Education, Faculty of Agriculture, Faculty of Business Economics, Faculty of Law, Faculty of Natural Sciences, Faculty of Engineering, Faculty of Medicine and Faculty of Social Sciences. and Political Science, University of Lampung.

The data collection techniques used observation participation and observation without participation, in-depth interviews and documentation. The intended documentation is to collect and study books, journals, photos, pictures, documentation of activities related to this research. To facilitate activities, documentation is carried out using tools such as image and sound recorders. The data analysis technique used in this study is an interactive analysis technique, namely data analysis techniques consisting of data reduction, data presentation and drawing and testing conclusions.

The sample of this study used a purposive technique. The sample is determined purposively so that the research sample does not need to represent the population, the consideration is more on the ability of the informant to supply as complete information as possible to the researcher. The research informants consisted of students from eight faculties at the University of Lampung. To get the depth of information in this research, research informants must have certain criteria. According to Faisal. 1999: 57-58, the criteria for informants are: 1. The subject has long and intensively integrated with the activities that are the target or attention of the research, this is usually characterized by the ability to provide information about something the researcher is asking. 2. Subjects who are still fully attached to the environment or activities that are the target or attention of researchers. 3. Subjects who have enough time to be asked for information, 4. Subjects who provide information do not tend to be processed or packaged first.

### IV. RESULTS AND DISCUSSION

#### 1 Different Definitions of Hijab

In general, Indonesian people say that the head coverings used by Muslim women are hijabs, headscarves, and hijabs. The veil/hijab in the Qur'an is explained in Surah An Nuur verse 31 with the term "khumur" (plural of khimaar) contained in the word of Allah SWT (meaning), "And let them (women) cover the veil to their chest". Many interpret Khimaar as a hijab. Imam Ibn Kathir explains in his book Tafsir Ibn Kathir what is meant by "khimaar" is anything that is used to cover the head (Tafsir Ibn Kathir, 4/227).

As for the word Hijab, in the Qur'an it is contained in Surah Al Ahzab verse 59, "O Prophet, say to your wives, your daughters, and the wives of the believers, 'Let them extend their headscarves all over their bodies.' " (Arabic: yudniina 'alaihinna min jalaabibihinna). Quoting Imam Al Qurtubi, (Tafsir Al Qurtubi 14/107) Hijab is a garment that covers the entire body. It is clear that the word hijab which is often used by Indonesians means khimaar in Arabic, and the long dress that covers the body is hijab in Arabic. This is different from the meaning of hijab which is interpreted by most Indonesian women.

#### Hijab as identity and non-identity

Hafizah, Y. (2018) explains that the hijab or head covering in a cosmopolitan society is not only an identity, but a phenomenon in society itself, which develops as a social identity, a new style and has an impact on the economic development of the community. Long headscarves, sarongs are considered not a Muslim identity anymore in Indonesia. For liberal Islamic networks and secularists, the hijab is not currently a mandatory identity that every Muslim must wear. Hijab is actually considered a culture brought from Arabia and India.

If a Muslim woman has worn the hijab in her daily life, then it is a sign that she has worn her identity as a Muslim. This must also be accompanied by self-confidence, pride in Islamic identity, and humility to carry out Allah's commands. Hijab is not something to be ashamed of. It is the identity of a Muslim who is the hallmark of Islamic teachings.

## Social Construction: Media, Hijab and Students Identity

As an identity, the use of the hijab has also been debated in the Indonesian police agency Hajad, V. (2019), this shows that the hijab can be accepted by the wider community. Either in official state institutions, or other private. The use of the headscarf is not only a phenomenon in Indonesia, but also in almost all countries where the population is Muslim. For example, how the sociological shift in England in the 1900s and 2000s, how the Muslim community, education and the hijab became a serious phenomenon in this country. Haw, K. (2009)

The emergence of various types of headscarves (small, medium and wide) has caused some special discourse in the media, how the media constructs an understanding of clothing that is considered not *syar'i*. Afifah, N. (2019). The use of the hijab in the hijaber community can also form a social identity as well as an ideology for social movements for women themselves. Fibrianto, A. S., & Bakhri, S. (2018) However, nowadays, the use of the hijab is not only a symbol of Islam and identity, but the hijab is now a new culture for the development of dress (style and fashion). In the end, the circle in the media, society, culture is a necessity that is continuous and never ending.

### Hijab and Media

Some media construct the use of hijab as an ideal clothing, with a veil a woman looks beautiful and there are no obstacles in her work. For example, horseback riding, archery or other occupations. Baulch, E., & Pramiyanti, A. (2018) So the media actually plays an important role in the development of the use of the hijab. Because the media can also affect the perception of its users. This perception then creates a certain motivation in using the hijab.

The twitter account @pedulihijab, is a twitter account on social media that cares about the use of the hijab in a *syar'i* way, this account explains the number of followers who get an understanding of the hijab apart from the taklim assembly which can be done directly. Septiana, D. (2018) In other studies that explain that friendship on social media or other internet can form identity for adolescents, self-concept and ideology. Soedarsono, D. K., & Wulan, R. R. (2017) Cyber media as a means of information, mostly reports about diversity, Loisa, R., Susanto, E. H., Junaidi, A., & Loekman, F. (2019) are no exception regarding issues hijab use. The diversity of the media about the hijab, of course, is based on economic, ideological or other social interests.

### Hijab and culture

The use of the hijab is also not only interpreted well by the hijab wearer, but there are also different meanings or perceptions about the use of this headscarf for male students, for example the opinion of an informant with the initials IN, he explained that the woman who wears the hijab seems feminist and diligent. worship. So in this study, all local communities and cultures crystallize in behavior to become identities. It is undeniable that the use of the hijab is also based on local culture. The use of headscarves consisting of medium, moderate headscarves tends to be inclusive-pluralist, moderate and veiled headscarves and shari'a tend to be religiously inclusive. Janah, U. R., & Aini, S. (2019)

In the previous explanation, there are several types of hijab use, including: slang, medium, and wide. Why does this happen? Of course, everything starts from understanding the hijab wearer, even though the source is one, namely the Qur'an and the hadith of the Prophet Muhammad. The culture of using the hijab is also inseparable from the development of the media, and the culture of today's society which usually products online. In addition, social media such as Instagram are also often found as sellers of hijab products. The effectiveness of social media, such as Instagram as a promotional medium for the Afra Hijab product. This Instagram social media is effective in promoting the Afra Hijab product. Nafis, A. G. R. (2018)

Other media, for example, is Instagram, this media is widely used as an external communication channel for hijabers, WhatsApp and Line as an internal communication medium for hijabers. In Indonesia, it is from these channels that hijabers form their social identity as well as a network for them. This is where the strong Muslim hijaber figures were born. Pramiyanti, A. (2019). The next development of the hijab is the perception of a fashionable hijab. The large number of slang use of headscarves has given rise to new designers who express the hijab in everyday life, and this adds to the splendor of the use of the hijab and adds new business opportunities in Indonesia. Qurrantain, N. (2018)

## V. CONCLUSION

Hijab is the identity of a Muslim woman which is the hallmark of Islamic teachings. When a Muslim woman wears the hijab, she must understand the concept, the basis as well as her identity. The phenomenon of the use of the hijab for Muslim students at the University of Lampung, cannot be separated from beliefs, friendships and the media that support it. Broadly speaking, there are three types of hijab models used by Muslim students at the University of Lampung: the first is a small or slang model (the hijab covers the head and neck), the second is medium (the hijab covers the head and chest) and the third is wide (the hijab covers the head to the stomach and even the neck). more). The social media used are Facebook, Instagram and Twitter. Social media is also a channel to strengthen ideology, understanding the use of headscarves, hijab models, and student perceptions.

## Social Construction: Media, Hijab and Students Identity

Media and the use of headscarves have an effect on identity formation for Lampung University students. The formation of this identity goes through a long process that crystallizes in people's lives.

### ACKNOWLEDGMENT

Authors would like to thank the Faculty of Social and Political Sciences, University of Lampung and the Department of Communication Studies for facilitating the research.

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## The Effect of Fixed and Changing Distance Drilling Exercise Methods on Archery Accuracy



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**ABSTRACT:** This study aims to determine the effect of fixed distance drills and changing distances on archery accuracy. This type of research is experimental research with the design of "Two One Group Pretest Posttest Design." The population in this study was archery athletes, totaling 58 athletes. The sample was taken by random sampling, totaling 20 athletes. The instrument used in this study is the Archery Accuracy Test. The analysis of the data used a 5% significance test. Data analysis used a t-test with a significance level of 5%. The results showed (1) a significant effect of fixed distance drilling exercises on archery accuracy, with a t-count of 15,810 > t table 2,262 and a significance value of 0.000 < 0.05. The magnitude of the increase in archery accuracy after being given a fixed distance drilling exercise is 5.62%. (2) There is a significant effect of changing distance drilling exercises on archery accuracy, with t count 9.256 > t table 2.447 and a significance value of 0.000 < 0.05. The magnitude of the increase in archery accuracy after being given distance drilling exercises changed by 9.94%. (3) There is a significant difference between fixed and extensive distance drilling exercises on archery accuracy, with a t-count 5.723 > t table 2.101 and a significance value of 0.000 < 0.05. Changed distance drilling exercises are better than fixed distance drilling exercises in archery accuracy.

**KEYWORDS:** fixed distance drilling, changing distance drilling, archery accuracy.

### INTRODUCTION

Archery is a combination of sport and art (Xue, 2022); (Li, 2018); (Lee, 2020). Archery is a sport because it uses components of the body from the hands, back, shoulders, and physical endurance. Archery is called art because it requires touch, the subtlety of soul feeling, patience, tenacity, and mental endurance (Verawati & Validanto, 2020). Archery aims to develop physical, spiritual, and social abilities and shape the character and personality of a dignified nation (Taha et al., 2018); (Artiuh et al., 2019).

Archery is a precision sport that requires consistency and stability of stable movements in order to hit the arrow accurately (Lo Presti et al., 2019); (Simsek et al., 2019); (Serrien et al., 2018); (Musa et al., 2019). Accuracy is the main thing in archery that must be mastered by athletes. If an archer does not have good shooting accuracy, athletes will find it difficult to win the competition. Athletes in archery are not required to have perfect technique. An archer is highly required to have good shot accuracy supported by archery techniques. If the technique is good and steady, it will make for a good shot (Prasetyo et al., 2022).

Achieving achievement in the sport of archery requires a special ability, both accuracy and coordination ability, as well as mental and excellent physical condition level (Suharta, 2019). In good physical condition, there must be steps that need to be taken, including training, improvement in the provision of infrastructure and facilities, problems with athletes and training, talent scouting, improving the quality of coaching, and so on. Exercise is defined as a process to systematically prepare the organism in athletes to obtain maximum performance quality by giving physical and mental loads on a regular, directed, graded, and repeated basis in time (Tryfidou et al., 2020). A good exercise is determined by a clear exercise program. The exercise program is a process of change for the better due to increased physical quality, the functional ability of the body components, and the psychological quality of the children being trained (Curran & Standage, 2017). The training method that will be applied is the fixed distance drill and changing distance.

The fixed distance drill method is a method that aims to improve technical skills (Pereira et al., 2017). In addition, the fixed distance drill method is included in closed motor learning, meaning that someone is doing something in a fixed environment, so that an athlete can control it and plan ahead. Easy to control and plan by the athlete himself. Blocked practice is a practice sequence where individuals repeatedly practice the same task (Raiola, 2017); (Nachmani et al., 2021).

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The variable distance drill method is for archery athletes with varying distances. That is, there are variations in training and setting the target distance that is not fixed. The implementation of the exercise with a random system is not sequential/regular in one training session, but rather emphasizes the variation of several target distances in the exercise. In randomized exercises, for example, the exercise sequences of a number of different tasks are mixed, or mixed, over the training period (Broadbent et al., 2019); (Beik & Fazeli, 2021). Random practice is defined as practicing tasks in a random order in such a way that each task is not practiced consecutively (Nachmani et al., 2021); (Krishnan et al., 2019); (Lelis-Torres et al., 2017); (Kim et al., 2018).

### METHOD

This type of research is experimental. Experimental research is basically testing the relationship between the cause variable and the effect variable. The design used in this study is the "Two Groups Pretest-Posttest Design", which is a research design that includes a pretest before being given treatment and a posttest after being given treatment, thus it can be known more accurately, because it can be compared with what was held before being treated (Counsell & Cribbie, 2017). The population in this study was archery athletes, totaling 58 athletes. Sampling was done by random sampling, totaling 20 athletes. All samples were subjected to an archery accuracy pretest to determine the treatment group, ranked their pretest scores, then matched with the A-B-B-A pattern in two groups with ten athletes each. The sampling technique used was ordinal pairing. Ordinal pairing is dividing a group into two with the aim of having the same or equal ability (Mustofa et al., 2019). The sample was divided into two groups, Group A was given a fixed distance drilling exercise, and group B was given changing distance drilling exercise. The instrument used in this study namely the Archery Accuracy Test.



**Figure 1. Archery Accuracy Test Target**  
(Source: Prasetyo et al., 2022)

The method of calculating archery accuracy is using an archer shooting 36 arrows from a distance of 30 meters. The total result is the sum of each arrow, called the total score, and the process is called the scoring (Yachsie, 2019). Validity uses content validity, and reliability with a retest test is 0.825.

### RESULT

**Table 1. Pretest and Posttest Data Archery Accuracy Drilling Fixed Distance**

No Subject	Pretest Score	Posttest Score	The Number Difference
1	291	304	13
2	285	300	15
3	283	299	16
4	279	290	11
5	275	290	15
6	275	287	12
7	271	291	20
8	269	284	15
9	265	285	20
10	264	282	18

The statistical descriptions of the pretest and posttest of archery accuracy in fixed distance drilling exercises are presented in Table 2 as follows:

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**Table 2. Descriptive Statistics of Pretest and Posttest Archery Accuracy Drilling Exercise Fixed Distance**

Statistik	Pretest	Posttest
<i>N</i>	10	10
<i>Mean</i>	275,70	291,20
<i>Median</i>	275,00	290,00
<i>Mode</i>	275,00	290,00
<i>Std. Deviation</i>	8,84	7,44
<i>Minimum</i>	264,00	282,00
<i>Maximum</i>	291,00	304,00

Based on Table 2 above, it shows that the pretest accuracy of archery drills at a fixed distance on average is 275.70 and increases at the posttest by 291.20.

**Table 3. Pretest and Posttest Data Archery Accuracy Drilling Practice Changed Distance**

No Subject	Pretest Score	Posttest Score	The Number Difference
1	288	311	23
2	288	312	24
3	282	306	24
4	279	307	28
5	272	310	38
6	272	302	30
7	272	305	33
8	268	299	31
9	265	288	23
10	261	280	19

Descriptive statistics of pretest and posttest The accuracy of archery drills in distance drilling exercises changes completely is presented in Table 4 as follows:

**Table 4. Descriptive Statistics Pretest and Posttest Archery Accuracy Drilling Practice Changed Distance**

Statistik	Pretest	Posttest
<i>N</i>	10	10
<i>Mean</i>	274,70	302,00
<i>Median</i>	272,00	305,50
<i>Mode</i>	272,00	280,00a
<i>Std. Deviation</i>	9,27	10,46
<i>Minimum</i>	261,00	280,00
<i>Maximum</i>	288,00	312,00

Berdasarkan Tabel 4 di atas, menunjukkan bahwa pretest Akurasi memanah latihan drilling jarak berubah rata-rata sebesar 274,70 dan meningkat saat posttest sebesar 302,00.

**Table 5. Normality Test Results**

Group		p	Sig.	Description
Accuracy Fixed Distance Drilling Practice Group	Pretest	0,830	0,05	Normal
	Posttest	0,344	0,05	Normal
Accuracy Drilling Practice Group Changed Distance	Pretest	0,509	0,05	Normal
	Posttest	0,060	0,05	Normal

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Based on Table 4 above, it shows that the pretest accuracy of archery distance drilling exercises changed on average by 274.70, and increased during the posttest by 302.00.

**Table 6. Homogeneity Test Results**

Group	Sig.	Description
Pretest-Posttest Archery Accuracy Fixed Distance Drilling Practice Group	0,779	Homogeneous
Pretest-Posttest Archery Accuracy Drilling Practice Group Changed Distance	0,438	Homogeneous

Based on Table 6 above, it can be seen that the pretest-posttest data archery accuracy scores sig.  $p > 0.05$ , so the data is homogeneous.

**Table 7. T-Test Pretest and Posttest Results of Archery Accuracy in Fixed Distance Drilling Practice Group**

Archery accuracy	Average	t-count	t-table	sig	Percentage
Pretest	275,70	15,810	2,262	0,000	5,62%
Posttest	291,20				

Based on the results of the analysis in Table 7 above, can be seen that the t count is 15.810 and the t table (df 9) is 2.262 with a p significance value of 0.000. Because t count 15,810 > t table 2,262, and a significance value of 0.000 < 0.05, this result shows that there is a significant difference.

**Table 8. T-Test Pretest and Posttest Results of Archery Accuracy in the Drilling Practice Group Changed Distance**

Archery accuracy	Mean	t-count	t-table	sig	Percentage
Pretest	274,70	15,051	2,262	0,000	9,94%
Posttest	302,00				

Based on the results of the analysis in Table 8 above, can be seen that the t count is 15,051 and the t table (df 9) is 2,262 with a p significance value of 0.000. Because t count 15,051 > t table 2,262, and a significance value of 0.000 < 0.05, this result shows that there is a significant difference.

**Table 9. T-Test Differences in Archery Accuracy Fixed Distance Drilling and Variable Distance Drilling**

Group	Mean	t-count	t-table	sig
Fixed Distance Drilling Practice Group	5,62%	5,723	2,101	0,000
Accuracy Drilling Practice Group Changed Distance	9,94%			

Based on the analysis results in Table 9 above it can be seen that the t count is 5.723 and the t table (df 12) is 2.101 with a p significance value of 0.000. Because t arithmetic 5.723 > t table 2.101, and a significance value of 0.000 < 0.05, this result indicates a significant difference.

## DISCUSSION

### Effect of Fixed Distance Drilling on Archery Accuracy

Based on the results of the analysis showed that there was a significant effect of fixed distance drilling exercises on archery accuracy. The magnitude of the increase in archery accuracy after being given a fixed distance drilling exercise is 5.62%. The fixed distance drill method is a method that aims to improve technical skills. In addition, the fixed distance drill method is included in closed motor learning, meaning that someone is doing something in a fixed environment, so an athlete can control it and plan ahead. Easy to maintain and plan by the athlete himself (Mu'ammara, 2017). Blocked practice is a practice sequence where individuals repeatedly practice the same task (Schmidt, 2017); (Nachmani et al., 2021).

## The Effect of Fixed and Changing Distance Drilling Exercise Methods on Archery Accuracy

The distance drill method remains a closed skill. Closed skills are when the supporter is either a surface, object, or other people displaying the skill in a stationary state. Closed skills are more accessible because they are influenced by individual abilities, so other factors outside motion do not affect them. So, the practice of the fixed distance drill method will be beneficial and it is hoped that the use of this method can increase the accuracy of efficient and perfect archery.

### Effect of Drilling Practice Distance changes on Archery Accuracy

The analysis results show a significant effect of changing distance drilling exercises on archery accuracy. The magnitude of the increase in archery accuracy after being given distance drilling exercises changed by 9.94%. Random practice is defined as practicing tasks in a random order in such a way that each task is not practiced consecutively (Nachmani et al., 2021); (Krishnan et al., 2019); (Lelis-Torres et al., 2017); (Kim et al., 2018).

The variable distance drill method is for archery athletes with varying distances. That is, there are variations in training and setting the target distance that is not fixed. The implementation of the exercise with a random system is not sequential/regular in one training session but rather emphasizes the variation of several target distances in the exercise. In randomized exercises, for example, the exercise sequences of several different tasks are mixed, or mixed, over the training period (Broadbent et al., 2019). Paying attention to the characteristics of the varying target distance drill method also has advantages in increasing cognitive skills. In this case, the target distance drill method changes designed so that the athlete is able to carry out the tasks that have been given with the specified target. Athletes are expected to be able to measure and shoot as desired. The cognitive learning stage (cognitive stage) focuses on cognitive-oriented problems related to what to do and how to do it (Winne, 2017). This stage is known as the cognitive stage because conscious mental processes dominate the early stages of learning. In this stage, students are almost completely dependent on declarative memory, and information is consciously manipulated and trained in formulating motor commands.

### The Difference between Fixed and Extensive Distance Drilling on Archery Accuracy

Based on the results of the analysis showed that there was a significant difference between fixed and extensive distance drilling exercises on archery accuracy. Changed distance drilling practice is better than fixed distance drilling exercise on archery accuracy. Several studies on the effect of the drill method were carried out by (Atmaja & Tomoliyus, 2015). This study aims to determine the difference in the effect of the constant bait drill training method and the variable bait drill training method. The results show that there is a difference in the effect of the constant bait drill method and the variable bait drill method. Furthermore, research conducted by (Mu'ammad, 2017) shows that there is a significant difference in influence between the drill method with constant target direction and variable target direction drill.

The drilling method is suitable for training, especially when practicing skills in a sport. Skills are given with the drill method because the same movement is done repeatedly, so an athlete will remember it in carrying out a movement (Mu'ammad, 2017). The advantage of the variable distance method is an opportunity to enrich the movement skills being trained. In this case, the drill's target distance changes, making a child display his best abilities and develop archery techniques to increase accuracy. In addition, the varying distance drill method requires athletes to be more skilled (Schmidt, 2017).

## CONCLUSION

Based on the results of data analysis, description, testing of research results, and discussion, it can be concluded that: (1) There is a significant effect of fixed distance drilling exercises on archery accuracy, with  $t$  count  $15,810 > t$  table  $2,262$ , and a significance value of  $0.000 < 0,05$ . The magnitude of the increase in archery accuracy after being given a fixed distance drilling exercise is 5.62%. (2) There is a significant effect of drill distance training on archery accuracy, with  $t$ -count  $9.256 > t$  table  $2.447$ , and a significance value of  $0.000 < 0.05$ . The magnitude of the increase in archery accuracy after being given distance drilling exercises changed by 9.94%. (3) There is a significant difference between fixed and extensive distance drilling exercises on archery accuracy, with a  $t$ -count  $5.723 > t$  table  $2.101$ , and a significance value of  $0.000 < 0.05$ . Changed distance drilling practice is better than fixed distance drilling exercise on archery accuracy.

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## Knowledge of Dental and Oral Health in Deaf Students at SLB Negeri Purworejo



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**ABSTRACT:** Knowledge of dental and oral health is a very important in supporting behavior to maintain dental and oral hygiene and health. Deaf children have problems in the hearing process. Hearing limitations in deaf children result in a lack of information obtained, including information on dental and oral health. The results of the preliminary study stated that 70% of the deaf students did not know about the knowledge of oral health. The purpose of this study was to describe knowledge of dental and oral health in deaf students at SLB Negeri Purworejo.

**Method:** This type of research is descriptive with cross sectional methods. The sampling method uses a saturated sampling technique. The number of samples used were 40 respondents to deaf students at SLB Negeri Purworejo according to the inclusion and exclusion criteria. The research instrument used a questionnaire on dental and oral health knowledge on deaf students. The results of the questionnaire were processed using cross tabulation to determine the results of descriptive analysis.

**Results:** The level of knowledge of deaf students (71.4%) is in the good category at the age of 16-19 years. The level of dental and oral health knowledge of male students is better than the gender of female students with hearing impairment (64.7%). The level of knowledge based on the last education of parents of deaf students was mostly in the good category at the last high school education (61.1%).

**Conclusion:** The level of knowledge about dental and oral health in deaf students is mostly in good category, namely at the age of 16-19 years, gender in male students, the last education of parents of deaf students is high school.

**KEYWORDS:** Knowledge, Dental and Oral Health, Deaf.

### I. INTRODUCTION

Good oral hygiene can be realized through good and correct knowledge and behavior towards the maintenance of dental and oral health. Knowledge is a factor that shapes a person's behavior. Lack of knowledge will form wrong behavior and attitudes towards dental and oral health maintenance. Knowledge that has been combined with understanding and potential to act on a person's behavior, generally has predictive ability to something as a result of recognizing a pattern. This happens because knowledge alone is not enough to support a person to change well, because it must be balanced with positive attitudes and actions [1-4].

Knowledge of dental and oral health is very important in supporting behavior to maintain oral hygiene and health. Behavior that is based on knowledge will last longer than behavior that is not based on knowledge. That a person's level of knowledge can affect a child's dental and oral hygiene status. Dental and oral health is a part of the body as a whole, namely as a gateway for germs and bacteria to enter which can interfere with the health of other body organs. Dental and oral health is closely related to dental and oral hygiene, because dental and oral hygiene is a basic factor for the creation of dental and oral health. Dental and oral hygiene can determine a person's level of dental and oral health [5-9].

The behavior of maintaining dental and oral health that is not good must be changed, such as: Clean your teeth regularly, namely by brushing your teeth; Avoid consumption of sweet and sticky foods and drinks; Expand the consumption of vegetables and fruits that are fibrous and watery which is good for the health of the body and teeth; Regular dental check-ups, regular dental check-ups by visiting the dentist need to be done at least once every six months, so that existing dental and oral health problems can be addressed as early as possible [10-12].

Deafness is a condition where a person's hearing function is impaired, which can be temporary or permanent. Deaf people will of course need a special form of communication so that the purpose of the conversation can be conveyed properly. Hearing

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limitations in deaf children result in a lack of information obtained, including information on dental and oral health. Lack of information on how to maintain dental and oral health in deaf children will form a wrong behavior that can affect dental and oral health [13–15].

Difficulty speaking is an obstacle that occurs in deaf children. Sign language is a way of communicating by deaf children. One of the difficulties that occur by communicating with sign language is how deaf children communicate, socialize, make friends and talk in daily interactions with fellow deaf children. In developing language and speaking skills, deaf children require special services to minimize the impact caused by the deafness he experienced. Social adjustment for deaf people is solely to adjust themselves to the surrounding environment so that they can interact well in their social environment [16–18].

### II. METHOD AND MATERIAL

The type of research used in this research is descriptive, which is an assessment carried out to describe or phenomena that occur in society. With cross sectional method [19]. This research was conducted at SLB Negeri Purworejo, Cangkreng Lor, Cangkreng, Purworejo, Central Java. The research sample was 40 students from 5th grade elementary school to 12th grade high school students. Sampling technique with saturated sampling technique.

Knowledge of dental and oral health in deaf students is measured using a questionnaire that includes good and correct brushing, good and bad food for dental health, knowledge of dental caries and its causes, and good and bad habits for teeth. This assessment is measured by 20 statements with alternative answers, namely true and false, a score of 1 for correct answers and 0 for incorrect answers. The scale used is the ordinal scale. The criteria for dental and oral health knowledge on the deaf have a value in the good category, moderate category, and poor category. The stages of carrying out the research start from licensing, preparation of research tools and materials.

### III. RESULT AND DISCUSSION

**Table 1. Frequency distribution of respondent characteristics**

Respondent characteristics	n	%
<b>Gender</b>		
Male	17	42.0
Female	23	58.0
Total	40	100
<b>Age</b>		
13-15 year	14	35.0
16-19 year	7	17.0
20-22 year	19	48.0
Total	40	100
<b>Parental Education</b>		
Primary school	13	32.0
Junior high school	9	23.0
Senior high school	18	45.0
Total	40	100

Table 1 shows that the frequency distribution based on the age group of deaf students from all respondents was dominated by the age of 20-22 years, namely 19 respondents (48%), female sex 23 respondents (53%) and parental education, namely high school 19 respondents (45%).

**Table 2. Frequency distribution of dental and oral health knowledge based on respondent age**

Age	Dental and oral health knowledge							
	Good		Moderate		Poor		Total	%
	n	%	n	%	n	%		
13-15 year	5	35.7	2	14.3	7	50.0	14	100

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16-19 year	5	71.4	0	0.0	2	28.6	7	100
20-22 year	11	57.9	2	10.5	6	31.6	19	100
Total	21	52.5	4	10.0	15	37.5	40	100

Table 3 shows that the criteria for dental health knowledge in deaf students at SLB Negeri Purworejo with 40 respondents are known to be at the age of 16-19 years, namely the criteria for good knowledge with a result of 71.4%. Age School children have the role of cadres of dental health workers or doctor cadres elementary school small teeth play a very important role in changing dental health behavior in equal elementary school groups, by being given encouragement and motivation in maintaining good dental health. The information obtained by deaf children with increasing age, the comprehension power and mindset will develop and the knowledge gained will be better. Knowledge is influenced by education level, the amount of information obtained, environmental conditions, experience, age and economic status of a person. Deaf students who have good reading comprehension will affect the results of good knowledge. People's interpretation of what they read will vary according to their level of experience. Errors in understanding reading material can cause communication to not work properly [20–22].

**Table 3. Frequency distribution of dental and oral health knowledge based on respondent gender**

Gender	Dental and oral health knowledge							
	Good		Moderate		Poor		Total	%
	n	%	n	%	n	%		
Male	11	64.7	3	17.6	3	17.6	17	100
Female	10	43.5	1	4.3	12	52.2	23	100
Total	21	52.5	4	10.0	15	37.5	40	100

Table 2. Shows that the results of the cross tabulation between the level of knowledge of dental and oral health in deaf students by gender showed that the majority were male with a good knowledge level with a result of 64.7%. Deaf male ask more questions and are active when they don't understand the questions. Deaf adolescent girls lack a sense of security shown by not being free from fear and tend to be less free from doubt. Deaf adolescent girls are also selfless and quite tolerant because they realize it is difficult to communicate and society rarely involves deaf young girls in conversation so that deaf young girls tend to be silent. This results in male deaf students having better knowledge than female deaf students because they have a sense of hesitation and fear because it is difficult to communicate.

**Table 4. Frequency distribution of dental and oral health knowledge based on respondent parental education**

Parental education	Dental and oral health knowledge							
	Good		Moderate		Poor		Total	%
	n	%	n	%	n	%		
Primary school	6	46.2	2	15.4	5	38.5	13	100
Junior high school	4	44.4	0	0.0	5	55.6	9	
Senior high school	11	61.1	2	11.1	5	27.8	18	100
Total	21	52.5	4	10.0	15	37.5	40	100

Table 4 shows that the results of cross tabulation between the level of knowledge of dental and oral health in deaf students with the last education of parents showed that the most recent education of parents was high school with a good level of knowledge with a result of 61.1%. Parental education greatly affects children's knowledge, the higher the education of parents, the child's behavior will be directed and knowledge will be good. The level of education of good parents will affect the size of student learning outcomes. With a good level of parental education, learning outcomes will also be good. Parents are the closest people to children. Parental education will shape and influence the mindset of the child's personality and lifestyle. Parents who teach children from

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childhood to adulthood will create a certain mindset in the child. The patterns of thought and patterns of life that exist are both good and bad. The importance of the educational background of parents in educating children will increasingly be able to help the learning process and success of children, besides that highly educated parents will also be different in directing and guiding their children. The higher the level of education of a person, the higher the possibility of having knowledge, including knowledge of dental and oral hygiene [23–25].

### VI. CONCLUSIONS

Based on the results of the study, it can be concluded that the level of knowledge based on the age of 16-19 years with good criteria is 71.4%, has good knowledge on good and correct brushing knowledge. Knowledge level based on male gender with criteria good at 64.7%, have good knowledge of good and correct brushing knowledge. The level of knowledge based on the last education of high school parents with good criteria is 52.5%, has good knowledge of dental caries knowledge and its causes.

### ACKNOWLEDGMENT

This study was done by self- funding from the authors. The authors thank to all partisipants and research assistan.

### CONFLICT OF INTEREST

The author declared that don't have conflict of interest

### ETHICAL CLEARANCE

This research has received a certificate of ethical approval from the ethics commission of the Yogyakarta Health Polytechnic with No. e-KEPK/POLKESYO/0041/I/2022.

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## Chinese Written Sources about the Relations of the Central Asia's People and China in VI-X Cent



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**ABSTRACT:** The article examines information about the relations between the peoples of Central Asia and China in the VII-X centuries on Chinese written sources. The works of the Sui Dynasty, Tang Dynasty and the Wu-dai era are mainly taken, but in addition to them, information from other chronicles that were created later is also given. When working on the article, was used the chronological method of compiling a list of sources. It is also possible to change the order in cases where the sources of the type of information complement each other. Each essay begins with the title and its translation from the Chinese language. Next, information about the author, the time of compilation and other data is given. Information about the relations between the peoples of Central Asia and China is transmitted in chronological order. One of the fundamental concepts of historical science is the "historical source". In the literal sense, the word "source" means a spring, a key, in the figurative sense-that which gives rise to something, serves as the basis for something. Indeed, every study of topics and problems of the distant or recent past begins with the identification, study and use of historical sources and is based on them.

**KEYWORDS:** Central Asia, China, Sui, Tang, Wu dai, sources, writings, relationships, fundamental concepts.

### INTRODUCTION

Today, the mutual interest between the countries of Central Asia and China is steadily growing. If one of China's interests is to create a raw materials appendix in the countries of Central Asia, then the latter has it in the development of the One Belt, One Road project. This approach will allow China to strengthen the influence over the policy of "raw materials in exchange for finished products". The countries of Central Asia will accelerate the development of transport connectivity, which has lagged behind due to continuous globalization. However, it cannot be assumed that such relationships arose precisely today and did not affect historical ties in any way. Due to this, new questions and historical theories will arise in the future, which will lead to research works. The best search for answers to historical questions begins with primary sources. However, the process of work is long and difficult, especially if you have no idea where exactly the facts are.

The purpose of the article is to simplify the task of searching for materials on Chinese written sources for researchers studying the historical relationship between the peoples of Central Asia and China in the 7th-10th centuries.

### LITERATURE REVIEW

The degree of study of the relationship between the peoples of Central Asia and China mainly dates back to the second half of the 20th century. Soviet scientists such as V.V. Bartold, L.R. Kyzlasov, N.V. Kuner, A.G. Malyavkin, G.P. Suprunenko, S.L. Tikhvinsky, Yu.A. Zuev and foreign ones such as I. Ecsedy, S. Mackkeras, E. G. Pulleyblank. However, the works of these scientists are more of a historiographic nature based on the work of past pioneer scientists N.Y. Bichurin and S.E. Julien.

Among the scientific works, one can also single out A.G. Malyavkina, V.F. Smolin, Liu Mao-Tsai, P. Pelliot and Abe Takeo, who worked to a greater extent with written sources and have an overwhelming amount of information about the relationship between the peoples of Central Asia and China. However, these works were aimed at studying specifically one or several peoples from many others.

The novelty of the work lies in the listing of Chinese written sources with a brief overview of the work and a description of the contents. However, the main emphasis was placed on information about the relationship between the peoples of Central Asia and China. The article indicates the exact location of the information and briefly talks about these facts. In addition, information

## Chinese Written Sources about the Relations of the Central Asia's People and China in VI-X Cent

about genres and types of compositions is transmitted. Chinese written sources were selected, which contain information about the periods of the Sui, Tang and Wu dai dynasties.

The Chinese official historical written works: daily chronicles, records of deeds and decrees of emperors are one of the main sources on the history of relations between the peoples of Central Asia and China (*Bernshtram* 1950: 33). In addition to the separate chapters specially designated for this in the dynastic chronicles, some information is also found in the tractates on astronomy, mathematics, music, administrative structure, laws, geography, in the biographies of famous statesmen and military leaders (*Kühner* 1961: 40). As noted by the famous Russian orientalist V.V.Bartold<sup>1</sup>, the history of the peoples of Central Asia is also well reflected in the Chinese written sources. And even today, despite significant advances in archaeological research in Central Asia in the 20th century, we agree with the opinion of the distinguished scientist that archaeological data cannot help us fully restore the general outline of political events and convey the state of mind of the era, and the inscriptions on the tombstones that belong to the Eastern Turki<sup>2</sup>, contain rather scant information (*Ganiev* 2010: 273).

The Turki are one of the peoples of Central Asia and the written information of Chinese authors is extremely important for the study of the history of the Eastern Turki (*Ganiev* 2010: 273). Thanks to the information from the Chinese sources, it is possible not only to study a number of little-studied issues on the history of the peoples of Central Asia, but also to develop new issues, including such as trade and diplomatic relations, cultural interactions between nomads and sedentary peoples, study of the main trends in evolution medieval links, development of a general concept of interactions, reassessment of the role of nomadic peoples in foreign policy.

The article focuses on the written sources, bearing in mind the high level of written source creation in China compared to the most of the medieval countries of the world, the importance of its monuments for historical reconstructions, as well as its close relationship with development of the philosophical and socio-political thought (*Smolin* 1987: 3).

### THE MAIN RESULTS AND FINDINGS

We begin the list of Chinese written sources with the works "Sui Shu" (隋书 "History of the [dynasty] Sui"), which describes the events of the Sui dynasty. "Sui shu" consists of 85 juan and is divided into 2 parts: the first part covers 629-636, it is devoted to imperial annals and biographies; the second part, on imperial letters, refers to 641-656. (*Tikhvinsky* 2014: 236). The author of this work is Wei Zheng<sup>3</sup>, but there is information that there were other authors who helped him in this matter (*Qu Lin Dong* 2012: 6). The composition was composed in the genre of "zheng shi" (正史 "official (dynastic) history"). Information about the origin and customs of the Eastern Turks correspond to the content of "Zhou shu". This indicates that either the source completely borrowed the text from "Zhou shu", or the same sources were used in the compilation of Sui shu (*Liu Mau-Tsai* 2006: 96).

Information about the relationship between the peoples of Central Asia and China is in the juans dedicated to the biography and annals of the Sui emperors.

For example, the juan "Zhi juan san" "志 卷三 (third entry)", the section "Li yi san" "礼仪三 (third entry on the rules of decency)" refers to the Donghu tribes and Western Turks who sent envoys with tribute to Emperor Wen di<sup>4</sup> with a request to conclude an alliance.

However, not all requests were accepted. For example, the juan "Zhi juan qi" "志 卷七 (seventh entry)", section "Li yi qi" "礼仪七 (seventh entry on the rules of decency)" says that the Turks came to offer military assistance against the rebels. However, Emperor Gaozu did not accept their proposal.

Despite this, the Sui court in most cases was more inclined to cooperate with the Turkic Khaganate. For example, the juan "Zhi juan shi" "志 卷十 (tenth record)", the section "Yinyue xia" "音乐下 (Music, second part)" tells about the arrival of the elders of the Turkic tribes to Emperor Yangdi with various tributes to their local products. They asked the emperor to marry their sons to Chinese princesses. Yang Di did not give a definite answer, but boasted, ordering a performance with songs in honor of the guests.

Information about economic relations also takes place in Sui Shu. For example, the juan "Lezhuan, juan yi" (列传 卷一 "biography, first volume"), section "Houfei" (后妃 "first bundle") refers to the trade and diplomatic relations between the Sui Dynasty and the Turkic Khaganate. Also, in this section there is information about several ambassadors poisoned to settle relations.

Many Turkic people did not personally meet with the emperors, but they kept constant correspondence with them. In the juan "Lezhuan, juan yi" (列传 卷二 "biography, first volume"), section "Li Mu zi hun Mu Xiongzi xun Xundi Chong Chong Zi min" (

<sup>1</sup> V.V. Bartold – the Soviet orientalist, academician who lived in the late 19th and early 20th centuries.

<sup>2</sup> Eastern Turki are a people of nomadic ancient Turks. In 603, the state was founded after the collapse of the Turkic Kaganate.

<sup>3</sup> Wei Zheng – the statesman, scholar-writer, historian of the Tang dynasty (580-643).

<sup>4</sup> Wen di – the Chinese emperor, founder of the Song dynasty (581-604).

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李穆子浑 穆兄子询 询弟崇 崇子敏 “Li Mu zi hun Mu Xiongzi xun Xundi Chong Chong Zi min (names)”) says about such exchanges of letters.

At the end of the reign of the Sui dynasty, the issues of the vassalage of the Sui dynasty in relation to the Turkic Kaganate were even considered. This is described in the *juan* “Lezhuan, *juan wu*” (列传·卷五 “biography, fifth volume”) in the section “*yiwen*” (译文 “translation”).

If at the beginning of the relationship, the Sui emperors did not give an unequivocal answer to the requests for marriage from the Turkic khagans to the Sui princesses, then in the end they willingly agreed. For example, the *juan* “Lezhuan, *juan liu*” (列传·卷六 biography, sixth volume) in the section “*Yiwen gao jiong*” (译文高颉 “translations about Gao jun”) tells about the arrival of Turkic ambassadors with requests for marriages.

The next piece of history is “*Da Tang Chuangye Qijuzhu*” (大唐創業起居注 “The Great Tang Dynasty Founding Diary”), which consists of three parts, each dedicated to a certain year. The author of the book, Wen Daya<sup>5</sup>, began writing the work in 618 and finished it in 626 (*Li Ji Ping* 1990: 56). The compositions were written in the genre of “*shishu*” (史书 “historical literature, also translated as a history textbook”). The work describes the events associated with Li Yuan<sup>6</sup> and the founding of the state, i.e. events between 615 and 618. Here, in detail, the relationship between the Tang empire and the Turks is reported (*Malyavkin* 1998: 32).

“*Da Tang Chuangye Qijuzhu*” is considered to be very rich in details about the military relations between the Tang Empire and the Turks, because the author served as a military chronicler under Li Yuan and he had access to documents [*Malyavkin*, 1998, p. 32].

Information about the relationship between the peoples of Central Asia and China is shown in the *juan* “*Qiyi qi zhi fayin fan sishiba ri*” (起义旗至发引凡四十八日 “Forty-eight days since the rebellion flag was raised”) in the form of diplomatic correspondence [between Shibir khagan<sup>7</sup> and Li Yuan], negotiations for an alliance [through the ambassadors Liu Wing<sup>8</sup> Jing and Gudulu Delei<sup>9</sup>], in descriptions of the exchange of gifts with the khagan.

At the end of 618, Li Yuan's military strategy changes and this is reflected in foreign policy. For example, in the *juan* “*Qishi zheng zhi jizhen ri fan yibai bashisan ri*” (起摄政至即真日凡一百八十三日 “One hundred and eighty-three days from the day of regency to the truth”), information is given about the sudden death of Shibir khagan and the coming to the power of Chulo Khagan as an excuse to start new trade relations in order to gain time for the accumulation of power against the Eastern Turkic Khaganate. [*Liu Mau-Tsai*, 2006, s. 110].

Many sources were devoted to a specific period. If one historian spoke of one thing, his colleague on the other side argued the opposite. Therefore, Du You<sup>10</sup> considered it necessary to write a comprehensive historical book “*Tong dian*” (通典 “The Code of General Institutions of State Administration” (*Malyavkin* 1989: 34)). The book covers historical material from 2717 BC. (ie, from the “Yellow Emperor” – Huang Di) – until 756 AD. (ie, before the Emperor Li Longji<sup>11</sup>) (*Couling* 1917: 73). Completed in 801, the work includes part of Liu Zhi's<sup>12</sup> undying political tractate. The writings include the genre “*zhengshu*” (政书 “political book, book of the ministry”).

“*Tong dian*” consists of 200 volumes and information about the relationship between the peoples of Central Asia and China is from 171 to 200. They contain information about population growth due to migrants from the Central Asian regions [*Malyavkin*, 1989, p. 34].

Many of the facts from the Tang Dynasty were not considered accurate enough because social experiments and analyzes were not carried out. One of the works differing in the reliability of historical facts “*Tang Huiyao*” (唐会要 “Consolidated Review of the Tang State”) (*Malyavkin* 1989: 362). Wang Pu<sup>13</sup> compiled previous works and presented it to Emperor Tai zu<sup>14</sup> in 961. The collection contains 100 volumes and 514 *juans* and covers the events of the period from 779 to Wu-dai<sup>15</sup>. Some information was borrowed from “*Tong dian*” and “*Ju Tang shu*”. In addition, it contains data from 846, which had already been met in the works of

<sup>5</sup> Wen Dai was the historian, thinker, and minister of the state of the Tang Dynasty (572-629).

<sup>6</sup> Li Yuan – the Chinese emperor, founder of the Tang dynasty (r. 618-626).

<sup>7</sup> Shibir khagan – the second Khagan of the Eastern Turkic Khaganate (609-619).

<sup>8</sup> Liu Wing – Ambassador, statesman of the Tang Dynasty.

<sup>9</sup> Gudulu Delei – Ambassador, statesman of the Eastern Turkic Khaganate.

<sup>10</sup> Du Yu – the Historian and Prime Minister of the Tang Dynasty (735-812).

<sup>11</sup> Li Longji – the 9th Emperor of the Tang Dynasty (r. 712-756).

<sup>12</sup> Liu Zhi – the Historian of the Tang Dynasty, author of the political book “*Zheng Dian*” 政典 (Foundational Source for Affairs Management)

<sup>13</sup> Wang Pu – the historian, chief adviser to the Later Zhou dynasty (876-905).

<sup>14</sup> Tai Zu is the founder of the Song dynasty (r. 960-976).

<sup>15</sup> Wu dai (907-960) is the name of a period in the history of China of five successive dynasties.

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other historians (*Liu Mau-Tsai* 2006: 115). The composition was composed in the genre of "shi shu" (史书 "historical literature, also translated as a history textbook"). However, the structures are characterized as "huiyao", a type of historical writing that describes the institutional aspect of the dynasty.

We find information about the relationship between the peoples of Central Asia and China in the 32nd and 34th *juan*. For example, there is information about the music of the peoples of the Western, Southern and Northern regions in the sections "Xi rong wu gong le" (西戎五國樂 "Music of the Western Turkic peoples") "Nanman zhu guo le" (南蠻諸國樂 "Music Southern Peoples") "Bei di sanguo le" (北狄三國樂 "Music of the three Northern states Di") [Tang huiyao (Shang, xia ce), 1978, E. 4876]. In the 72nd *juan* there is information about the trade of Tibetan horses in the section "Zhu fan ma yin" (諸蕃馬印 "All about Tibetan horses"). There is information on prices, quantities and demand for horses. In the 94th *Juan* there is information about the relationship between the tribes of the northern Turks in the section "Bei tujue" (北突厥 "Northern Turks"), Western Turks in the section ("Xi tujue" 西突厥), the Turks-shato "Shatuo tujue" (沙陀突厥 "Turki-shato") and Tagone<sup>16</sup> in the section "Tu yu hun" (吐谷渾 "Togon"). In the 100th *juan*, the information is given about trade and ambassadorial relations, which continued with various states: Gaochan<sup>17</sup> in the section "Gaochang" (高昌 "Gaochan") (*Borovkova* 1992: 79), Qidan<sup>18</sup> in the "Qidan" section (契丹 "Qidan"), Shiwei<sup>19</sup> in the "Shiwei" section (室韋 "Shiwei"), Tiele<sup>20</sup> in the "Tiele" section (鐵勒 "Tiele"), Xueyantuo<sup>21</sup> in the "Xueyantuo" section 薛延陀 "Xueyantuo"), Tufan<sup>22</sup> in the section "Tufan" (吐蕃 "Tubo"), Uyghurs in the section "Huihe" (迴紇 "Uygur"), tanguts<sup>23</sup> in the section "Dang" (黨 "Tanguts"), Tokharistan<sup>24</sup> in the section "Tuhuolu" (吐火羅國 "Taharistan"), Jibin<sup>25</sup> in the "Jibinguo" section (罽賓國 "Jibin"), Kamchatka in the "Liuguiguo" section (流鬼國 "Land of Wandering Ghosts"), Shigo in the "Shiguo" section (史國 "Shakhrisabz"<sup>26</sup>), Bosi in the section "Bosi" (波斯國 "Persia"), Tian<sup>27</sup> in the section "Tianguo" (天國 "India"), Gelulu<sup>28</sup> in the section "Gelolu" (葛羅祿 "Gelulu") and Dashi in the section "Dashiguo" (大食國 "Arabia"). It also provides general information on the regions where these peoples live and what role they play in China's foreign policy (*Ganiev* 2010: 276).

After the fall of the Tang dynasty, China was divided between the Hou Liang<sup>29</sup>, Hou Tang,<sup>30</sup> Hou Jin<sup>31</sup>, Hou Han<sup>32</sup> and Hou Zhou<sup>33</sup> dynasties (*Couling* 1917: 98.). During the period of unrest and internecine wars, the history of China was poorly covered in terms of official confirmed data. Wang Pu continued his research and wrote the book "Wu dai huiyao" (五代會要 "Consolidated Review of the "Five Dynasties" period") and finished work in 961 (*Ganiev* 2010: 276).

The book reports that the five kingdoms divided northern and central China between themselves, while the other parts were in the possession of ten smaller independent states. This composition was also written in the "shi shu" genre and compiled according to the "huiyao" type.

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<sup>16</sup> Tagone (284-670) is the Tibetan name for the state of Tuyuyhun.

<sup>17</sup> Gaochang (440-640) an ancient military colony founded by the Hunnic rulers which turned into Buddhism center.

<sup>18</sup> Kidanes (907-1125) – the tribes of the Mongolian group, in ancient times roaming the territory of modern Inner Mongolia and the Mongolian People's Republic.

<sup>19</sup> Shiwei (544-847) – the ancient Mongolian tribes (nomads) who lived in eastern Mongolia, parts of Inner Mongolia and northern Manchuria (up to the Sea of Okhotsk).

<sup>20</sup> Tiele (546-840) – the tribal confederation of Turkic ethnic groups living in Central Asia. Also called Tholos.

<sup>21</sup> Xueyantuo (605-646) – the ancient Turkic people, one of the largest of the fifteen Uighur tribes.

<sup>22</sup> Tufan (633-842) – the dynasty that ruled in the territory of modern Tibet.

<sup>23</sup> Tangutes (982-1227) – the people of the Tibeto-Burmese group who created the state of Xi Xia in northern China in 1038.

<sup>24</sup> Takharistan is the name of the historical and cultural region on the territory of the southern part of Tajikistan, the southern part of Uzbekistan and the northern part of Afghanistan.

<sup>25</sup> Jibin (115-758) is the name of the state that arose near the Kabul River, Afghanistan.

<sup>26</sup> Shakhrisabz is the ancient state on the territory of Uzbekistan.

<sup>27</sup> Tian – the ancient Asian kingdom on the territory of modern India, the limits and boundaries of which have changed significantly at different times.

<sup>28</sup> Gelulu (644-1211) – the Turkic tribe, consisting of 3 clans; rose in the VIII century. after the collapse of the Turkic Khaganate.

<sup>29</sup> Hou Liang (907-923) – Late Liang dynasty, the first of the five dynasties of the "Five Dynasties and Ten Kingdoms" era in China. Founded by Zhu Wen,

<sup>30</sup> Hou Tang (923-937) – Late Tang dynasty, the second of the five dynasties of the "Five Dynasties and Ten Kingdoms" era in China. Founded by Li Cunxu.

<sup>31</sup> Hou Jin (936-947) – Late Jin dynasty, the third of the five dynasties of the "Five Dynasties and Ten Kingdoms" era in China. Founded by Shi Jingtang.

<sup>32</sup> Hou Han (947-950) – Late Han Dynasty, the fourth of the five dynasties of the Five Dynasties and Ten Kingdoms era in China. Founded by Liu Zhiyuan.

<sup>33</sup> Hou Zhou (951-960) – Late Zhou dynasty, the fifth of the five dynasties of the "Five Dynasties and Ten Kingdoms" era in China.

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"Wu dai huiyao" consists of 30 *juan*, which are numbered consecutively and called "Wu dai fang yao" (五代防要 "Desire to protect the Five Dynasties"). Each chapter contains information about the relationship between the peoples of Central Asia and China (Kradin 2014: 128).

For example, in references to the external threat from 907 to 960. Information is always given about the Khitan raids on the territory of China. All five dynasties sent tribute through ambassadors in the form of several thousand rolls of silk. Also, in the sections on the Hou Jin dynasty, it is said that they officially considered themselves vassals of the Khitan and annually sent 30 thousand rolls of silk materials in tribute.

In addition to official writings, there are also works that were considered private for a long time, but after a while they were officially recognized. One of such works is "Jiu Wu dai shi" (旧五代史 "Old Chronicle of the Five Dynasty period") and "Xin Wu dai shi" (新五代史 "New Chronicle of the Five Dynasty"). Both works were composed in the "zheng shi" genre. "Ju Wu dai shi" contains the most information about the emergence of states and protection from external neighbors (Liu Mau-Tsai 2006: 120). The author of the book, Xue Juzheng<sup>34</sup>, completed the work in 973-974. It consists of 150 *juans* and describes the period from 907-960. (Kuehner 1961: 14).

Information about the relationship between the peoples of Central Asia and China is in *juans* dedicated to the five dynasties of the Wu Dai period.

For example, the *juan* "Juan sanshier (Tang shu)" (卷三十二 (唐书) "The 32nd volume of the Later Tang Dynasty") in the section "Zhuangzong Ji Liu" (庄宗纪六 "Sixth record of the ancestor") refers to the Turkic ambassadors, who arrived at the court of the Late Tang Dynasty with days of local products.

After that, it is reported that relations between the late Tang dynasty and various Turkic tribes became warm. For example, in the *juan* "Juan sanshijiu (tang shu)" (卷三十九 (唐书) "Volume 39 of the Later Tang Dynasty"), section "Ming zong ji wu" (明宗纪五 "Emperor Ming zong, fifth record") data on invitations to the court of the Turkic elders already from the Late Tang dynasty.

However, the Turkic tribes had an active foreign policy not only from the Late Tang dynasty. For example, in the *juan* "Juan bashi (Jin shu)" (卷八十 (晋书) "80th volume on the Jin dynasty"), section "Gao zu ji liu" (高祖纪六 "The sixth entry on Gao zu") contains information about sending Turkic ambassadors to the court of the Hou Jin dynasty.

Another work, "Xin Wu dai shi" (新五代史 "The New History of the Five Dynasties"), was also considered private. The author of the book, Ouyang Xiu<sup>35</sup>, corrected the shortcomings in the text and reduced it to 75 *juans*. Both works were officially recognized in 1077 (Flug 1959: 56).

Information about the relationship between the peoples of Central Asia, the data in both sources is very rich, since the dynasties of the Wu dai period tried to maintain their sovereignty by gathering as many allies as possible. [Liu Mau-Tsai, 2006, s. 121]. Also, if in "Jiu Wu dai" shi there is more information about the Turkic tribes, then "Xin Wu dai shi" paid equal attention to the rest of the peoples of Central Asia.

For example, in the *juan* "Liang benji dier" (梁本纪第二 "the second record of the Later Lian dynasty"), it is said that Khitan envoys were sent to the court (you need to know where).

In relation to the Uighurs, an active foreign policy was also conducted. For example, the *juan* "Tang benji di wu" (唐本纪第五 "fifth record of the Later Tang Dynasty") refers to the dispatch of Uyghur envoys to the court of the Later Tang Dynasty.

Each of these books was very voluminous and informative, in connection with which it became necessary to create an encyclopedia "Cefu yuan gui" (册府元龟 "Collection of books of the big turtle"), the materials of which are presented in various thematic headings (Flug 1959: 60). The composition was assigned the genre "lei shu" (类书 "subject reference book, encyclopedia").

The commission of historiographers headed by Wang Qin<sup>36</sup> worked on the compilation of the encyclopedia consisting of 1000 *juans* in 1005-1013 from 1047 BC to 960 AD and (Couling 1917: 154). It extensively covers the history of relations between China and the peoples of the Khitan, Turks and Shato<sup>37</sup>.

For example, in the *juan* "Sanshiqi, Diwan bu" (卷三十七, 帝王部 "volume-37, department of the monarch"), section "Songde" (颂德 "virtue"), it is said that Turkic ambassadors were sent to the Sui court with gifts in the form of thoroughbred horses.

<sup>34</sup> Xue Juzheng - historian, statesman of the Song Dynasty (912-981).

<sup>35</sup> Ouyang Xiu is a Chinese statesman, historiographer, essayist and poet of the Song Dynasty (1007-1072).

<sup>36</sup> Wang Qin - Chief Minister of the Northern Song State (962-1025).

<sup>37</sup> Shato-Turks (600-907) are the Turkic nomadic people, descendants of the Central Asian Huns.



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Also in *juan* "Ibailiu shi si Diwan bu" (卷一百六 四, 帝王部 "volume-164, department of the monarch") section "Zhao huai dier" (招怀第二 "call for a hug, part two") speaks of sending Turkic ambassadors to various emperors from the Tang Dynasty with the days for the purpose of settling relations.

Messages about Khitan ambassadors sent to conclude trade and diplomatic relations with the Tang Dynasty are in the *juan* "Ba, Diwan Bu" (卷八, 帝王部 "Volume-8, Department of the Monarch"), section "Chuangye disi" (创业第四 Entrepreneurship, Part Four).

If the previous peoples had more equal diplomatic relations, then the Shato Turks were a little dependent on the Tang dynasty. For example, in the *juan* "Yibai Qishi, Diwan Bu" (卷一百七十 帝王部 "Volume-170, Department of the Monarch") 帝王部, the section "Lai Yuan" (来远 "to go far") refers to the Shato Turks whose Fan Xi Zhao<sup>38</sup> settled in Yanzhou by order of the emperor of the Tang Dynasty after a crushing defeat by the Tibetans. It is also said that for their bravery, the emperor allowed the founding of the Yinshanfu region and appointed their leader Zhuye Zhiyi as commander in this area.

During the Song Dynasty, the study of history was again continued. During the period of the South Song state, the official and historian Sima Guang wrote his main essay – the work on the history of China called "Zizhi tong jian" (资治通鉴 "Universal mirror, helping the government") (Crespigny 1973: 35). Covers eleven periods of Chinese history, including the Sui Dynasty, Tang Dynasty, and Five Dynasties (403 BC to 960 AD), with the total history of sixteen dynasties. The 7294-volume chronicle contains about three million hieroglyphs and is written in the style of an edifying and instructive textbook (Bo 2001: 501). With the support of Emperor Shenzong<sup>39</sup>, Sima Guang created a group of famous scholars of the time, such as Liu Bang<sup>40</sup>, Liu Shu<sup>41</sup>, Fan Zui<sup>42</sup>, and others, each of whom was responsible for writing the respective chapters. Information about the relationship between the peoples of Central Asia and China in the 7th-10th centuries is given in the sections on some peoples (Yap 2009: 187).

One of such peoples is the Turks or various tribal unions of the Turks. For example, in the seventh *juan* "Sui ji" (隋纪 "Record of Sui"), it is said that a rebellion was raised with the aim of a coup in the country during the reign of Emperor Yan Di<sup>43</sup>. Liu Wu Zhou<sup>44</sup> sent ambassadors to the Turkic Khaganate, asking for vassalage and assistance against the rebels (Crespigny 1973: 30). Information about the arrival of many Chinese ambassadors from different kingdoms and states to the Shibir Kagan in order to attract the Kagan to their side begins with the first *juan* "Tang Ji" (唐纪 "Record of Tang"). The growing power of the Turkic Khaganate is reported, examples of the subjugation of the Khitan and Turfans are given (Bo 2001: 503). The same information is given in the third *juan* "Tang ji" (唐纪 "Record of Tang"), which refers to the attacks of the Shibir Kagan on the Tang possessions in the western border region. They also meet about Liu Wu-Zhou, who helped organize the recruitment of troops from the inhabitants into the Turkic army. It is also said about the Turfans, who, after a long exchange of ambassadors, nevertheless began to pay tribute to the Western Turkic Khaganate. Further, there is a description of the struggle of the Western Turks with the Northern, information is given about the arrival of the ambassadors of the Western Turks in Chang'an<sup>45</sup> with a request for assistance against the Northern ones (Ji 2003: 29). There is information about the petition of the hand of the Chinese princesses by the Turkic tribes. Information about the marriage contracts of Il-khagan<sup>46</sup> is in the fifth *juan* "Tang ji" (唐纪 "Records of Tang"). The Kagan of the Western Turkic Khaganate Tun-Jabguhan<sup>47</sup> also sent ambassadors to ask the hand of the Chinese princess. This is reported in the seventh *juan* Tang Ji (唐纪 Records of Tang) (Yap 2009: 188). The information about the state of Karashar<sup>48</sup> in the thirteenth *juan* "Tang ji" (唐纪 "Records of Tang") says that they were subordinate to the Western Turkic Khaganate and that only the marriage union between the Karashar princess with the younger brother of Chulikhhan<sup>49</sup> improved the situation and allowed trade and ambassadorial relations to be revived.

<sup>38</sup> Fan Xi Zhao - Jiedushi (commander) of Yanzhou (years unknown)

<sup>39</sup> Shen zong - the sixth Chinese emperor of the Song dynasty (r. 1067-1085).

<sup>40</sup> Liu Bang is the famous historian of the Song Dynasty period (1022-1088).

<sup>41</sup> Liu Shu – the historian, head of Sichuan province (1032-1078).

<sup>42</sup> Fan Zui is the historian, poet, scholar and writer of the Song Dynasty period (1041-1098).

<sup>43</sup> Yan Di – the second emperor of the Chinese Sui dynasty (r. 605-617).

<sup>44</sup> Liu Wu Zhou – the Chinese commander, staged a mutiny and went over to the side of the Turkic Khaganate (r. 617-620).

<sup>45</sup> Chang'an (206 BC-1234 AD) is a now nonexistent town in China, the ancient capital of several Chinese states. It was the destination of trade caravans that went along the Great Silk Road to China.

<sup>46</sup> Il Kagan is the founder of the Turkic Khaganate (r. 682-693).

<sup>47</sup> Jabguhan is the fifth khagan of the western Turkic khaganate (city of pr. 618 - 630).

<sup>48</sup> Karashar (75-719) – the ancient Buddhist city-state of Karashar (which means "black city").

<sup>49</sup> Chulikhhan – the high-ranking official of the Western Turkic Khaganate.



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In the fourteenth *juan* "Tang Ji" (唐纪 "Records of Tang"), it is reported about the Shibir Khagan<sup>50</sup>, who declared himself the great khagan and expressed a desire to continue relations with the Tang court. In the twentieth *juan* "Tang Ji" (唐纪 "Records of Tang"), information about negotiations with Muohon is reflected, who sent ambassadors with gifts in the form of thoroughbred horses, and in return asked for a Tang princess as his wife.

And in the thirtieth *juan*, "Tang ji" (唐纪 "Records of Tang"), it is said about after by the name of Fu, who offered to submit to the Tang court (Ji 2003: 30). There is also a lot of information about the Uighurs. For example, in the fortieth, forty-first, forty-fourth, forty-ninth *juan* "Tang ji" (唐纪 "Records of Tang"), full information is given, facts are given about the emergence of the Uighur state, about their trade and ambassadorial relations with the Tang court (Yap 2009: 188). The main commodities for sale were horses, which were priced at forty *lians*<sup>51</sup> in the market. Trade and ambassadorial relations were maintained by constant gifts sent to the palace to the emperor. Further information is supplemented by facts about a thousand ambassadors who were sent to the palace. These ambassadors were allowed to trade with China, but demanded to wear only national clothes, organize exhibitions about their cultural values and not marry Chinese women (Benn 2002: 65). The Uyghurs, seeing the interest from the Tang court in cultural peculiarities, send many Uyghur women to the court. At the end, information is given about the reasons for the rupture of warm relations and how both sides collected intelligence materials about the area.

In the essay, in addition to information about the Turkic and Uighur peoples, there is information about relationships with other peoples.

Sima Guang compiled "Zizhi tong jian" within the framework of strict academic standards and even compiled a separate work Kao Yi (考义 Research). This is a kind of a guide to numerous sources and reasons for their preference. In 1084, both works were completed (Crespigny 1973: 27).

During the Qing Dynasty, the collection of complete vaults was also resumed. The works of "Gujin tushu jicheng" 古今图书集成 ("Complete collection of books of antiquity and modernity" or "Complete collection of ancient and modern books") was written in the traditional Leishu<sup>52</sup> genre, including the events of the 7th-10th centuries. (Liu Mau-Tsai 2006: 93). It is the first national encyclopedia of China that has survived to this day in full, and the largest of the paper ones currently existing on Earth. The main text contains 10,000 *juans* and about 160 million hieroglyphs (Couling 1917: 157). In 1701, Chen Menglei<sup>53</sup>, by order of the Kangxi<sup>54</sup> Emperor, began compiling a large encyclopedia. In 1726, the work was completed, the emperor approved it and wrote a preface. In 1728, 64 sets of an encyclopedia were printed under the title "Qingding Gujin Tushu Jicheng" (钦定古今图书集成 "The highest established complete collection of books of antiquity and modernity" (Ibid).

In contrast to the Yongle<sup>55</sup> phonetic system, "Gujin Tushu Jicheng" is built on the principle of rubricating and is divided into six collections: Celestial bodies; Earth; Judgments about peoples; Natural science; Humanitarian sciences; Board affairs (Ibid).

Information about the relationship between the peoples of Central Asia and China is in the *juan* "Fangyu Huibian" (方輿汇编 "Composing about the Earth") in the section "Bianyi dian" (边裔典 "Border laws"), which reports on trade and ties in China with India and the Kingdom of Khotan<sup>56</sup> VII-X centuries. In the *juan* "Ming lun huibian" (明伦汇编 "Judgments about people") in the section "Zong ren fu" (宗人府 "Ministry of Court Affairs") there is information comparing the envoys of the Central Asian region of the Tang and Ming<sup>57</sup> epochs. In the *juan* "Li xue huibian" (理学汇编 "Humanities") in the section "Jingji dian" (经籍典 "Canonical literature") there is information about the historical geography of the Central Asian region (Wang Yin 1987: 54).

## CONCLUSION

In conclusion, we can say that these Chinese written sources relating to the history of the VII-X centuries were translated by already well-known scientists. However, many scientists who have worked with these written sources have studied them in relation to places related to the history of certain peoples of Central Asia. Few people have worked exclusively in the field of relations between the peoples of Central Asia and China. Therefore, it has become quite imaginative for us to collect already studied or not studied information about relationships for researchers in order to speed up their research. Also, the sinologists

<sup>50</sup> Shibir Khagan is the second khagan of the Eastern Turkic Khaganate (r. 609-619).

<sup>51</sup> Lian – in the source it is stated as a banknote of the Tang Dynasty period.

<sup>52</sup> Leishu – the genre that implied an Encyclopedia of 100 sections. Contains excerpts from many works, arranged under specific sections or topics.

<sup>53</sup> Chen Menglei is the historian and mentor of Yinjing, Crown Prince of the Ming Dynasty (1543-1605).

<sup>54</sup> Kangxi is the fourth representative of the Manchu Qing dynasty (r. 1661-1723).

<sup>55</sup> Yongle is the largest non-electronic encyclopedia in the history of mankind. Created by order of the Chinese Emperor Yongle.

<sup>56</sup> Khotan (66-1001) was the state on the Great Silk Road, located on the southern edge of the Taklamakan Desert in the Khotan oasis.

<sup>57</sup> Ming (1368-1644) – the dynasty that ruled in China.

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and orientalists listed in the article convey to the researcher a not very clear picture of the place of the information in written sources. since today there are many versions of editions of these works, it is difficult to determine what data is given and where they are. In the article, it is prudent to find the location in a clearer way, despite the publications.

As for the article itself, not all-important sources are collected here. The most important works "Ju Tang Shu" and "Xin Tang Shu" are missing, which tell in more detail about the history of the Tang Dynasty. since there is a lot of information, the volume of the article does not allow us to expand to a monograph, and therefore these works were published in the form of another separate article.

We hope our work will accelerate the work of other researchers studying the relationship between the peoples of Central Asia and China, which is the main goal.

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## Theoretical-Conceptual Framework of the Methodology for the Development of Language Competence in the Teaching of English as a Foreign Language at the Pre-University Level



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**ABSTRACT:** In the last five years, the Dominican educational system has undergone a series of transformations, as a result of the implementation by the Ministry of Education (MINERD) of a process of revision and update of the curricular bases, with a view to the implementation of a new curricular design by competencies. These reformulations seek, in short, the achievement of the goals set around the improvement of educational quality demanded by society and the "right to full and comprehensive human development of all citizens. The general objective of the study is to develop a methodology with the integration of technology for the development of linguistic competence in the learning process of the English language, as a foreign language at the pre-university level of the Dominican educational system, and thus positively influence in the fulfillment of the objectives foreseen in the curricular design (linguistic level B2)

For the fulfillment of the outlined objectives, the various scientific methods of theoretical, empirical and statistical-mathematical research are used. For data collection, two questionnaires were used for teachers to publicize the methodologies that are implemented for the development of linguistic skills in the teaching of English as a foreign language at pre-university levels, generating a scientific contribution for their contribution and perfect it.

The results obtained from the research indicate a group satisfaction index by teachers of 0.9, thanks to the strategies and their impact on the development of linguistic skills as a foreign language, taking advantage of the influence of families. Also, a favorable score was obtained in the activity plan for teacher training. On the other hand, the application of focus group techniques in which the methodological conceptions and the plan to train teachers are considered. Finally, recommendations are made for the strengthening of these activities and at the same time, collaborate to continue with the effectiveness of the strategies in linguistic competences.

**KEYWORDS:** Linguistic skills, foreign language, English teaching.

### INTRODUCTION

Linguistic competence is essential for human development, as it enables people belonging to a community to understand each other through various linguistic and non-linguistic systems. This competition allows the expression of ideas, emotions, feelings, cultural and artistic values. It is essential for the construction of personal and collective identity and for the formation of a worldview that allows interpreting and acting in the world. In addition, it is a fundamental strategy for the organization and construction of thought. In this sense, the development of linguistic aspects (both oral and written production and comprehension) is within this great competence.

Language is the instrument of thought and learning. Through communicative competence (oral expression and comprehension, written expression and comprehension) we receive information, process it and express our thoughts. Therefore, communicative competence has a decisive influence on the quality and precision of the information we receive, in turn, this information is the raw material for the elaboration of our thoughts. It is not possible to have clear thoughts from diffuse information.

Linguistic competence becomes a reality when users are able to understand and understand each other both orally and in writing. In this regard, the Common European Framework of Reference for Languages states that "... when a foreign language is learned, linguistic and cultural competence in each language is modified by knowledge of the other language and contributes to

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creating an awareness, some skills, some intercultural capacities. They allow the individual to develop a richer and more complex personality, and improve the capacity for subsequent language learning and openness to new cultural experiences" (Council of Europe, 2002) Education in the Dominican Republic is regulated by the Ministry of Education, according to the General Law of Education 66-97, which guarantees the right of all the inhabitants of the Dominican Republic to education.

In the curricular design of the pre-university level, the English language is one of the nine subjects taught in public schools, in such a way that learning the English language from an early age (5th grade of primary school) is part of the purpose of said design. Dominican schools begin the first contact with the English language at the primary level. Specifically, most students are between 9 and 10 years old, which translates into a certain delay in coming into contact with this language.

According to what was published on February 11, 2013 by the Ministry of Education of the Dominican Republic entitled: "Identification of advances in the scientific and literary disciplines associated with the area of Foreign Languages that must be taken into account for the revision and updating of the curriculum ", it is stated that learning a foreign language responds to a fundamental need in the formation of the citizen of these times, since it develops the communicative competence of the students so that they can understand and express themselves efficiently, orally and in writing, with members of other societies in different contexts. In the same way, respect and appreciation of one's own cultural identity and that of other societies, as well as plurality, both in the local environment and in the global environment, are encouraged. Learning a foreign language contributes to the personal development of students because:

- Facilitates the search and processing of information.
- Offers a more efficient use of Information and Communication Technologies.
- Expands the cultural universe of the individual, by enabling greater exchanges of artistic, scientific, historical and technological Productions that humanity has been building.
- Facilitates access to more and provides opportunities in the educational, labor and professional areas.
- Promotes the development of linguistic and metalinguistic awareness, the formation of concepts, logical reasoning, creativity, Skills.

All these reasons create the perfect environment for the development of language skills to be of vital importance not only for students, but for all Dominican citizens. The methodological and curricular renewal of learning a foreign language begins by recognizing the needs of our time that is the key to understanding education in competencies: a know-how that resizes educational work.

The development of this competence is a process that occurs gradually during school life. The present study is based on the reality that graduates of the pre-university level of the academic modality of the Dominican educational system present low performance in the development of linguistic competences of the English language as a foreign language. According to what is stated in the Study on the reality of the English Language Teaching-Learning Program of the MINERD at the secondary level, from 2008 to 2012, it explains that: "The deficiencies in the teaching of English in the public schools of the Dominican Republic are perfectly salvageable, if greater support is given to the teachers that we have in the system, and they are provided with ongoing sustained training oriented to specific purposes for two or three years, both in the development of effective pedagogical skills, as well as in the development of a greater and better command of their language skills" (Professional Training Systems, 2016). Therefore, this study seeks to determine the conditions, factors, causes and variables that improve the development of this competence. Starting in 1995, through Ordinance No. 1-95 dated August 28, 1995, a new curriculum was established for initial, basic, secondary, special and adult education. In this scheme, basic education comprised eight years divided into two cycles of four years each: the first cycle, from 1st. to 4th grade, and the second cycle, from 5th. To 8th degree. It is in the second cycle of the basic level, in compliance with article 19 of the ordinance, where the subject Foreign Languages is assigned four class hours per week in each of the following grades: 5th, 6th, 7th. And 8th.

As for secondary education, it was comprised of four years, divided into two cycles of two years each. Articles 23 and 24 of Ordinance No. 1-95 established the workload for the area of Foreign Languages - French, where the first cycle was assigned two class hours per week, and in the second cycle, in the general modality, four hours were allotted, which was a significant step forward in learning and mastering French as a second foreign language. Undoubtedly, Ordinance No. 1-95 stamps a range of importance on the French language, since the established academic load guaranteed at least eight years of teaching this language in public schools and private centers.

Today more than ever it is essential for all public school graduates to have a B2 level in the English language, since it is one of the most advanced levels and describes a series of skills and knowledge that the student must have to reach said level. The English language is the language of the world today. It is in the era of globalization, the great international language, a "lingua franca" that



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has had repercussions in all non-Anglo-Saxon countries, including the Dominican Republic and that directly affects the various professional fields such as: health, industry, and education. Globalization, the internet, social networks and the possibility that our children will enjoy greater and better opportunities in the future than we do, are factors that are influencing us as parents to be more interested in giving them the possibility of speaking another language.

The author of this research coincides with the annual report Horizon Report (Report, NMC Horizon, 2017) where it is highlighted that the learning process resurfaces with the appearance of two technologies that have transformed the communication landscape in societies penetrated by ICT: The Moos (MOOC, acronym in English for Massive Online Open Course translated into Spanish as Massive and Open Online Courses) Google Classroom and the integration of computer applications (APPS) to the process of learning a foreign language.

The possibilities of connecting from anywhere and developing any of the components of the linguistic competence of the English language are becoming increasingly accessible to any student. Cell phones, for example, have revolutionized the era of communications, providing today not only the functionality of communication between people, but also include features such as Internet access, data transmission, teleconferences, etc. All these facilities have been used in recent times to be applicable in education, so that people can be in constant learning wherever they are.

According to the Dominican Institute of Telecommunications (Índotel), it was highlighted that in 2017 internet accounts grew by 26% and the use of the Internet in the Dominican Republic reaches 70% connectivity, which implies, according to studies, an impact of 3% in the growth of the economy for every 10% of connectivity. 50% of the students of the pre-university level of the Dominican schools own or have within their reach any mobile device that could be used in a pedagogical way and not as a learning distraction. 70% of public educational centers have a computer lab with technological tools, however, they are not used satisfactorily. The English language as a foreign language was included in Dominican schools as of 1950 through Ordinance No. 842-50, dated September 28, 1950. It was taught in the third and fourth grades of high school with a load of three hours. weekly class. Later, starting in 1970 and by means of Ordinance No. 1-70, three class hours per week are established from first to third grade of high school and four class hours in fourth grade of high school, in all modalities. This was established in articles 9 and 16 of the aforementioned ordinance. Later, in 1986, by means of Ordinance No. 1-86, the teaching of French was also included from the seventh grade of primary school, currently the first grade of secondary school, which was maintained until the year 1995 when the educational reform started from the year 1992.

In correspondence with the problem raised, and with the aim of achieving a positive impact on the development of the linguistic competence of the English language, the following is identified as a Scientific Problem of this research: How to contribute to the development of the linguistic competence of the English language in the pre-university level in such a way as to achieve adequate fulfillment of the objectives foreseen in the curricular design (linguistic level B2) of the same?

The object of the research is the teaching-learning process of the English language at the pre-university level and as a field of action the development of the linguistic competence of the English language with the integration of technology.

General Objective: To develop a methodology with the integration of technology for the development of linguistic competence in the learning process of the English language, as a foreign language at the pre-university level of the Dominican educational system, and thus positively influence the fulfillment of those of objectives foreseen in the curricular design (linguistic level B2).

### **Specific objectives**

1. Analyze the theoretical foundations that support the elaboration of the methodology to contribute to the development of Linguistic competence in the process of learning English as a foreign language at the pre-university level, with an action-based Approach, with the integration of ICT.
2. Make a diagnosis of the problem to know the real situation of the graduates of the Liceo Morayma Veloz de Báez educational Center, pre-university level, and academic modality, used as a case study.
3. Design a methodology with integration to technologies based on the linguistic competences of the Common European Framework of References for Languages.
4. Assess the proposed methodology.

To fulfill the objectives set, theoretical, empirical and statistical-mathematical scientific research methods are used, among which the following stand out:

### **Theoretical methods**

1. The systemic approach, to study the problem and the object, taking into account its components and the interrelationships, interconnections and links that are established between them. It also made it possible to organize the structure of the investigation, giving it the character of a system.



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2. Analysis - synthesis: It was applied throughout the investigative process to reach the multifaceted knowledge of the educational system, detail the essential elements that make it up, as well as the links and networks between them and the most general characteristics of the pre-university educational system of the Republic. Dominican.

3. Induction - deduction: It was used from the compilation of the empirical material to obtain generalizing conclusions, which together with the theoretical study allowed the elaboration and foundation of the proposal and its schematic representation

4. Deductive hypothetical: It allowed to elaborate the hypothesis for the solution of the negative aspects and weaknesses, which facilitated the projection and forecast of the expected results.

### **Empirical**

1. Participant observation: It was used in the exploratory phase, framing the problem in a general way and assessing the most Outstanding effects that characterize the real state of the object to be investigated. It was also applied throughout the Investigative phase, as well as to compare the conditions and characteristics of the partial and total results during the conduct Of the investigation and its consequent analysis.

2. Survey: It was implemented in the diagnostic stage, to obtain information about the opinions on the fundamental aspects of The use of technology in the teaching of the English language.

3. In-depth interview: It was also applied in the diagnostic stage to complement the information from the survey, which would Make it possible to have information related to the opinions of personalities linked to the educational process and their criteria About the use of educational technology.

4. Documentary analysis: It allowed the study of the most recent publications on educational technology and on the best practices In the fulfillment of these purposes.

5. Experimental: It was applied in its quasi-experimental variant to verify in practice the effectiveness of the proposed Methodology.

6. Osgood Scale: To find out the teachers' assessment of the strategy and plan of activities for teacher training

7. Consultation with experts: The Delphi method was applied to find out the opinions of professors and experienced personalities About the strategy, in particular the validity, quality, dimensions and feasibility of applying the proposed strategy.

8. The Focus Group technique was used to validate the relevance and impact achieved with the application of the strategy.

The novelty of the work is given by the conception and foundation of a methodology with the integration of technology that contributes to the development of the linguistic competence of the English language, as a foreign language at the pre-university level, which favors the development of linguistic competences.

Theoretical contribution: foundation of the methodology, which integrates elements of the action-based approach and task-based learning in advanced technological environments.

Practical contribution: A procedure for the implementation of the methodology designed with integration to technology in the conditions of the development of linguistic competences in the learning of the English language at the pre-university level.

Methodological Contribution: Procedures, methods and techniques, applied to the pedagogical structure of the methodology, constitute the Dominican educational process due to its novelty and timeliness adjusted and contextualized to the current demands of international education under the UNESCO principles in which it is denoted the quality of education as a fundamental factor, so the results obtained can be applied for future research.

## **THEORETICAL-CONCEPTUAL FRAMEWORK OF THE METHODOLOGY FOR THE DEVELOPMENT OF LANGUAGE COMPETENCE IN THE TEACHING OF ENGLISH AS A FOREIGN LANGUAGE AT THE PRE-UNIVERSITY LEVEL**

Communication occupies about 80% of the total time of human beings. This time is distributed to a greater extent in oral skills (listening and speaking) and to a lesser extent in written skills (reading and writing). This phenomenon provokes the need to reconceptualize and innovate in terms of teaching methodologies and instructional design theories, since the most recognized theories in these areas have been modeled mostly in educational contexts focused on the learning of disciplinary content.

Since 1995, the Ministry of Education has made great efforts to promote the development of language skills in schools, incorporating a bilingual monitor for each educational region into the schools, who is in direct contact with the good classroom practices of teachers.

One of the functions of pre-university schools in the Dominican Republic is to promote the development of students' linguistic competence in the English language, so that they become competent speakers. A competent speaker is one who manages both to produce and interpret statements appropriate to the situation in which he/she participates, who can use language as a tool to achieve different purposes and knows how to adapt his/her language to the situation.

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Already for the year 2000, the first didactic guide for the teaching of the English language supported by technology was proposed, consisting of four parts: the first two dedicated to the development of the basic vocabulary that the teacher requires and the last two parts are dedicated to the development of Didactic strategies for teaching the English language.

At the beginning of 2005, the design of the curricular update begins and a new conception for the teaching of English is incorporated and the language resource centers are created. It is proposed to deploy a learning strategy adjusted to the Common European Framework of Reference (CEFR) for languages: learning, teaching and evaluation.

The development of English language skills as a foreign language has expanded from the teaching of discrete grammatical structures throughout life. This chapter conceptualizes and reaches conclusions regarding advanced teaching-learning theories and methods in the field of curricular design and the didactics of foreign language learning and the technologies that can favor a better development of defined linguistic competence as a field of research action.

The development of English language skills as a foreign language has expanded from the teaching of discrete grammatical structures throughout life. This chapter conceptualizes and reaches conclusions regarding advanced teaching-learning theories and methods in the field of curricular design and the didactics of foreign language learning and the technologies that can favor a better development of defined linguistic competence as a field of research action.

### **EVOLUTION OF LANGUAGE LEARNING AND ITS RELATIONSHIP WITH TECHNOLOGICAL DEVELOPMENT**

Current educational trends focus mainly on the learner, student or apprentice, and it is considered that this should be the protagonist of their own growth, which is supported by constructivist theories that emphasize the fundamental role of the student in the construction of their knowledge.

These constructivist theories are based on the idea that the individual is not a simple product of the environment or the result of their internal dispositions, but their own construction that is produced day by day as a result of the interaction of these factors (Ausubel, Novak, & Hanessian, 1983); (Baquero, 1996). That is why a quality education cannot be carried out without the active participation of the student in the educational project.

Faced with a changing society in which social and educational systems seem to be evolving day after day, in which there is talk of a crisis of thought and cultural impostures, where we see the consolidation of dominant political-social globalizing trends, which have accentuated abysmal differences between wealth and poverty, it becomes imperative to seek ways to mitigate these contrasts.

Technological advances that are increasingly embedded in teaching have led to the categorization of education, perhaps because they become facilitators and generators of autonomous learning or because they point to another path towards meaningful education; The truth is that since the appearance of the Internet, the information generated, dispersed at first, is reorganized over time and becomes a participant, now indispensable, in teaching.

A great growth of research that guides Web 3.0 towards the search for a more intelligent Internet, based on what is known as the Semantic Web (SemWeb): "making knowledge more accessible to computer programs", seeking to obtain relevant answers to the questions. It is sought that the Web platform becomes at the same time a development platform: more intelligent, more personalized, more contextualized and therefore more interrelated with education.

It is known that "the current information society, characterized by the widespread use of computer technologies in all human activities and by a strong trend towards economic and cultural globalization" (Domingo, 2019), leads to a new culture that supposes new ways of seeing and understanding the world, the use of new machines and instruments and the implementation of new values and norms of social behavior.

It is necessary to find a balance between the expectations, formulated in the minimum content to transmit and learn and the basic social behaviors expected of the participants in the educational process, and the differentiated demands and goals, exposed in the personal characteristics that must be had taking into account the capacity and pace of each participant, and the behaviors that should be developed gradually.

Among the objectives of current Dominican education is that related to the formation, training and preparation of citizens for life from a Social Constructivist perspective, as well as the achievement and graduation of professionals capable of facing the challenges and transformations that are manifested today in the different branches of science and who are in charge of solving the problems that arise in the sphere of production and services.

To achieve this objective, it is necessary to face an essential problem that lies in the preparation of boys and girls based on the performance of their work as future professionals, for which it is necessary to appropriate a host of technical-professional skills that They will allow us to face the quality required for the production process, having as a precedent an undergraduate training in tune with current transformations and that is materially evidenced in the conception of quality and scientifically justified solutions.

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The author of this research agrees with this approach and considers that the use of multimedia in the educational teaching process, based on establishing different technological modalities for the planned content, improves student concentration, is motivating and contributes favorably to the understanding of content in pre-university education.

These systems face the challenge of responding to what is essential and to the interaction of any human communicative situation. Today multimedia can mean many things, depending on the context and the type of specialist who defines it.

To promote learning, schools must personalize teaching, offer support and recovery to students who need it, encourage the less gifted with exercises and gradual evaluations that allow a slower but reasoned progress, and that motivates them to give the best of themselves, while encouraging the most gifted with stimulating jobs and opportunities to demonstrate their own abilities, and in this the use of technological resources is fundamental from an early age.

According to Ortega (2017), the introduction of ICTs in teaching cannot be done as if they were an external instrument detached from the didactic system of the subject, embracing its function as a means and integrating them into the didactic system: objectives-contents-methods-means, this it is a more complex system.

An encouraging pedagogical future is appreciated as long as these technological incentives really become tools that contribute to the common good; without losing sight, first of all, that the fundamental thing in the pedagogical view is to determine if we have digital skills to be able to exercise the teaching function in the 21st century. And, regarding the students, if the activities that we propose really develop digital skills or are they a mere transposition of traditional activities to the new tools; and these are some of the big issues that require constant rethinking (Ortega, 2017).

### **DEVELOPMENT OF LINGUISTIC COMPETENCE AND ITS RELATIONSHIP WITH TECHNOLOGICAL DEVELOPMENT**

In order to carry out the tasks and activities that are required to deal with the communicative situations in which they are involved, students use various skills developed in the course of their previous experience. In turn, participation in communicative events results in further development of the learner's skills, both in immediate use and in long-term use.

All human competencies contribute in one way or another to the communicative capacity of the user and can be considered as aspects of communicative competence. However, it is useful to distinguish between general skills less related to language and language skills proper.

Curiel (2017) highlights that the current information society, characterized by the widespread use of information technologies in social life and by a strong trend towards economic and cultural globalization, leads to a new culture that involves new forms of see and understand the world, the use of new machines and instruments and the implementation of new values and norms of social behavior, although the theory on which the research is based must always be kept in mind, which is carried out in the educational field, especially when the recipients are children and adolescents.

Each individual must develop a prior reasoning that adequately identifies the most effective type of communication (who is the recipient, the communicative intention, how to express oneself, among others). Therefore, communication will begin as the response to a innate need that will become learned and become part of one of the most important skills of every human being.

According to Cañas & Chacón (2015) the neuroscientific orientation now taken to the educational field, demands a great challenge for the teacher in the sense of broadening the understanding of the learning processes, not only from the cognitivism or socio-psychological orientation but also from its anatomical action; conceived from deep analysis, reflections and contrasts.

In this society of mobility of cultures and access to knowledge, the English language becomes a primary tool to build a representation of the world; in a basic instrument for the construction of knowledge, to carry out learning, for the optimal management of new technologies and for the achievement of full social and cultural integration. Likewise, and as a consequence of the role it plays in the construction of knowledge, language is closely linked to thought processes and the mastery of linguistic skills, such as, for example, cognitive skills, motor skills or skills related to planning and control of the learning activity itself.

Ortega (2016) states that a survey conducted by the Society for Human Resource Management (SHRM) in 2014, on the gap between economic conditions and the skills in demand, found that the 2,583 respondents cited the thought critical/problem solving (40%), professionalism/ethical work conduct (38%), leadership (34%) and written communications (27%) as the top four skills employees fail at. The survey also stated that you can have the best processes and the best technology, but if your people are not able to communicate them, if they do not effectively demonstrate that they can work as a team, have critical thinking and emotional intelligence, they will not help your business be successful. The experts surveyed also agree that technical skills can be taught much more easily than linguistic skills. Also, he comments that non-cognitive or socio-affective skills are transcendental in today's society.

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The Ministry of National Education (2016), shows the benefits of mastering a second language, after having reached a certain level of cognitive development in a first language, this makes the individual develop a higher degree of metalinguistic awareness and an increase in ability to appreciate the arbitrary and the conventional in linguistic symbols.

The fundamental purpose is to ensure that they acquire and develop their competence in that code in such a way that they use the foreign language to relate knowledge, to understand and interpret the surrounding reality and to share ideas, feelings and opinions in communication situations in which some patterns of linguistic and social behavior typical of the cultures where the foreign language is spoken.

According to Cruz & Ramírez (2018), communicative competence is understood as the ability of a person to behave effectively and appropriately in a given speech community; this implies respecting a set of rules that includes both those of grammar and the other levels of linguistic description (lexical, phonetic, semantic) as well as the rules of language use, related to the socio-historical and cultural context in which communication takes place.

Another important concept in the opinion of this researcher is that offered by Fernanda (2016) "Communicative competence comprises the skills and knowledge that an individual must have in order to use linguistic and translinguistic systems that are available to them to communicate as a member of a community sociocultural given.

The Common European Framework of Reference for Languages speaks of communicative competences of the language, which include linguistic, sociolinguistic and pragmatic competences, and which -in turn- are integrated into the general competences of the individual, which are the following: knowing (general knowledge of the world, sociocultural knowledge, intercultural awareness); know-how (skills and abilities); knowing how to be (existential competence: related to attitudes, motivations, values, beliefs...); and knowing how to learn.

### **THE CONCEPT OF LINGUISTIC COMPETENCE**

The concept of Linguistic Competence was already used by Chomsky in 1965, defining it as a system of rules that, internalized by the student, make up his verbal knowledge (expression) and allow him to understand an infinite number of linguistic statements (comprehension), referring to knowing how to use the grammatical rules of the language. On the other hand, Pragmatic Competence is defined as the ability that the learner acquires to know how to use a language properly, leading him to know the non-linguistic procedures: the needs, the intentions, the purposes, among others, referring to knowing how to use functions in communicative situations (García, 2018).

Linguistic competence includes lexical, phonological and syntactic knowledge and skills, and other dimensions of the language as a system, regardless of the sociolinguistic value of its variants and the pragmatic functions of its realizations. For effective communication in the English language, the satisfactory development of linguistic competence is required, for which the following must be mastered:

- Oral comprehension, which consists of understanding the oral messages received.
- Oral production, which is the verbal expression of thought.
- Written comprehension consists of interpreting a written text
- Written production, which is the representation of words by recognizable graphic signs.

This component, which is considered here from the point of view of the communicative linguistic competence that a specific individual possesses, is related not only to the scope and quality of knowledge (for example, the phonetic distinctions made or the extension and precision of vocabulary), but also with the cognitive organization and the way in which this knowledge is stored (for example, the different associative networks in which the speaker places a lexical element) and with its accessibility (activation, retrieval and availability) (Pérez & Trejo, 2013).

The knowledge may or may not be conscious and easily expressed (for example, once again in relation to mastery of a phonetic system). Its organization and accessibility varies from one individual to another, and also varies within the same individual (for example, for a multilingual person, depending on the inherent varieties of their multilingual competence).

The communicative linguistic competence that the student or user of the language has is put into operation with the performance of different activities of the language that include comprehension, expression, interaction or mediation (specifically, interpreting or translating). Each of these types of activities is made possible in relation to texts in oral or written form, or both. As processes, comprehension and expression (oral and, where appropriate, written) are obviously primary, since both are necessary for interaction (Cervantes Virtual Center, 1999 - 2020).

They are also important in many forms of learning (understanding the content of a course and consulting manuals, reference works and documents). Expression activities play an important role in many academic and professional fields (oral presentations,

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studies and written reports) and are given a certain social value (assessments made of what has been presented in writing or of the fluency in the articulation of oral presentations).

In interaction, at least two individuals participate in an oral or written exchange in which expression and comprehension alternate and may actually overlap in oral communication. Not only can two interlocutors be talking and listening to each other simultaneously; even when speaking time is strictly respected, the listener is usually already predicting the rest of the speaker's message and preparing a response (Centro Virtual Cervantes, 1999 - 2020).

According to Ramírez (2017) a foreign language is one that is different from the mother tongue, in the case of the Dominican Republic, since 1995 public schools have officially taught two foreign languages, adult users generally acquire a foreign language if learns it consciously, whether in a school, in the case of children, the earlier they are exposed to contact with the foreign language, the better their learning will be, which is manifested in the development of linguistic skills.

Many studies have highlighted the value of natural exposure through study abroad or other very particular extra-curricular experiences of sociolinguistic variation (Ramírez, 2017)

The Dominican educational society and the school itself require that knowledge be managed through the process of learning the English language. It is necessary for the school to contribute to strengthening the teaching of the English language, especially in the following aspects:

- Correct articulation, so that the pronunciation of sounds is clear.
- Intonation appropriate to the nature of the speech.
- Expression with voice audible to all listeners.
- Fluency in the presentation of ideas.
- Appropriate use of gestures and mime.
- Relevant and timely participation.
- Capacity for persuasion.
- Clear expression of ideas (Palomino, 2014).

### **RELATIONSHIP TECHNOLOGY AND TEACHING-LEARNING OF FOREIGN LANGUAGES**

The English language is no longer just a necessity, it has become the international language, indispensable for diplomatic, scientific, political, and educational affairs. Today, there are many causes and very diverse reasons why English has become an international language. In fact, knowledge of it is almost an indispensable condition for professional success. Added to all this is the great boom in the use and development of technology in the learning process (Miranda, Montejo, & Morales, 2019).

Currently there are many benefits that the digital age offers to the process of learning English as a foreign language. The digital age is a driver of the quality of the educational process, and allows the overcoming of space-time barriers, greater communication and interaction between teachers and students, active participation in the process of collective construction of knowledge and development of skills. With them, both the student body and the teaching staff of the teaching and learning programs have the possibility of greater interaction with students and faculty of other programs, institutions and places, both national and international. This provides the opportunity to build knowledge with the use of updated content and teaching material, as well as access to an incalculable amount of free teaching resources both in face-to-face and online modalities.

ICTs, and especially educational applications, are the innovation of the moment and allow teachers and students to make decisive changes in the daily tasks of the classroom and in their teaching-learning process. The APPS favor schools that do not have a library or educational material. These technologies allow us to enter a new world full of easily accessible information for teachers and students. In the same way, they facilitate the learning environment, which adapts to new strategies that allow creative and fun cognitive development in the traditional areas of the curriculum.

The challenge that the new society poses to the teacher is not reduced to a scientific-didactic update on a series of contents of formal education, nor is it limited to school spaces, but rather they have to take part in the non-formal education of their students, promoting school-society interrelationships. The concept of teacher has undergone a profound change with ICT, since it goes from being a mere transmitter of knowledge to being a guide. The student also changes, and goes from being a passive subject to adopting an active role.

Learning occurs through interpersonal interaction, based on tasks and problem solving to exchange experience and knowledge while the content emerges from that collective interaction.

The social nature of language learning in virtual worlds makes Dogma an appropriate method for using the ideas, reactions and impressions derived from social interaction as teaching material, which is why the Dogma principles are:

1. Teacher-student and student-student interactivity as a fundamental way of learning.



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2. The commitment (Engagement) established between students that increases when creating the didactic materials under the teacher's guidance.
3. The dialogical principle contributes to social learning, students interact, build knowledge and develop their skills.
4. The scaffolding (Scaffolded conversations) occurs in pleasant, family, collaborative and cooperative conversations, mutual help In the construction of knowledge and the development of skills is fundamental.
5. The emergence of language and grammar occurs during learning with a different view than other theories on language Acquisition.
6. Learning opportunities (Affordances) and student identity (Voice) consists of optimizing learning opportunities and addressing The language that emerges from the exchange of knowledge, belief and experience.
7. Empowerment, relevance and critical thinking implies carrying out learning activities without textbooks, but with relevant materials that stimulate learning with a critical sense to discover their cultural and ideological premises.

From these principles emerge the three fundamental guidelines of Dogma:

Conversation-centered teaching that is based on conversational exchange through interaction and transaction, where the emphasis is more on the content than on the syntactic aspect so that the student focuses on the meaning of his speech. That is, teaching is based on conversation and learning is the result of interaction, real communication.

Free teaching of published materials focuses teaching on students, cooperative-collaborative learning and mutual help so that students are the authors of the materials that are used. Emergence supports learning as a process where language emerges in activities that lead to collaborative-cooperative communication so that students discover the linguistic forms they need and use them. It is important to review and highlight the linguistic forms used to stimulate the emergence of language and the development of content during the learning process.

Dogma restores the principles of communicative teaching by being compatible with reflective practice and humanizing the classroom through dialogic critical pedagogy, and shares the principles of task-based learning with the same philosophy, although using different methods. The tendency is to use the language naturally in communicative tasks and for knowledge to be built cooperatively and collaboratively.

### **TANDEM**

The Tandem method has been treated by different authors, according to Álvarez, et al. (2007), Tandem is a method used by two people, natives of different languages to learn from each other, it is an open learning method between two people of different languages mother mothers who collaborate and help each other to learn their respective languages through the exchange of personal and professional experiences.

Tandem is an autonomous learning method and is based on real communication between native speakers, each user is a source of linguistic, social and cultural information on the language that their interlocutor is studying (González, 2012).

Tandem is characterized by:

- True communication in an act of authentic interaction between real and native people. The learning environment is natural, with almost no external control. Error inhibitions are reduced, learning is relaxed, and achievement is increased.
- Learning in real practice, in personal contact with natives and their cultural, social and professional environment. Each one is a Linguistic and extralinguistic model, with its taboos and way of expressing emotion, praising and accepting praise. These aspects Become familiar in the interaction with the native speaker of the language being studied.
- Reciprocity and mutual support because each one is responsible for the learning of the other and strives to help him. Success Lies in the confidence to request, give and receive help, together they decide what mistakes to correct, when and how often to Do it.

The use of Tandem requires a distribution of time in equal parts, it implies deciding the time to be used so that there are mutual benefits and learning without limitations in an open and fluid environment. The corrections are made in the language that is being used and without hindering communication, it is recommended to correct the most frequent errors that affect comprehension, not to look for words in the dictionary or use a third language. The frequency of the meetings is important, they must be planned according to objectives and schedule. The meetings must be systematic, scheduled and lasting over time, one hour a week is a good option.

### **TASK BASED LANGUAGE LEARNING (ALBT)**

Task-based language learning is a method of interest addressed in numerous scientific publications. In a general sense, Zaldívar (2016) considers that task-based language learning (task-based instruction and problem solving) is a method that facilitates the



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understanding and production of language in social interaction. Tasks should be communicative and reflective, focusing on meaning without downplaying form. The teacher's job is to lead the student to perform the task by focusing their attention on the information or content and using the linguistic elements of the personal record of it. Error correction should be done at the end of the task.

The tasks available on the Web are varied in their form, they have the introduction of the subject, the objectives and the explanation of how to carry them out. These tasks include the following:

1. Tasks to list information and fill in the blanks. When the information is analyzed and the graphs, tables and diagrams are completed, the exchange and conversation between the participants is generated (List).
2. Tasks to organize information in a logical-chronological way, order data, categorize data into groups, extract-recycle information And compose texts or dialogues (Order and Classify).
3. Tasks to compare points of view, connect specific points and find similarities or differences when describing images or situations (Compare).
4. Logical reasoning tasks to solve communicative problems (Problem Solving).
5. Tasks to solve a communicative problem by exchanging ideas and experiences (Sharing personal experiences).
6. Tasks to work on projects under the guidance of the teacher (Projects) (Zaldívar, 2016).

According to Zaldívar (2016), this method is characterized by:

1. the lack of information in the tasks to develop significant communicative competence by solving communicative needs and problems and internalizing the language as a result of the inner psychic process through the use of the target language.
2. The understanding and production of language focused on the meaning and content of the message such that creative and Conscious learning is stimulated during the construction of knowledge with logical thinking and the participants' own strategies. Learning tasks should be about routine and professional activities so that students understand and communicate by concentrating on the content of the message rather than the form. For this, it is necessary to guide the objective precisely, negotiate with the students how to carry out the tasks and what means to use, in this way continuous learning and active participation is achieved.

On the other hand, the tasks must be real so that communicative competence is exercised and developed in open situations, reflecting what is done in daily and professional life (Zaldívar, 2016).

### **GUIDED DISCOVERY LEARNING**

Guided discovery language learning (ALDG) is a method of interest reflected in different scientific publications. ALDG is a self-regulatory activity in problem solving that requires hypothesis testing as the logical center of discovery. It could be said that it is a constructivist learning theory that consists of the self-taught acquisition of knowledge. The content is not presented in its entirety to motivate interest in discovery, it is necessary to avoid the simple reception of the content to stimulate autonomous learning with the search and manipulation of information.

The ALDG is a method that guides the student to build their knowledge autonomously according to their learning style and pace. The design of the task must guarantee that the student progresses satisfactorily and assimilates the information. It is a non-passive learning method, the student discovers the concepts and their relationships, reorders them and adapts them to their cognitive scheme with investigative skills based on the inductive method and problem solving (Zaldívar, 2016).

This method requires adequate guides and materials to stimulate observation, comparison and analysis. The students discover the communicative functions and the linguistic forms necessary to carry out the learning tasks.

The ALDG helps to eliminate the limitations derived from mechanistic learning and stimulates the confirmation of intuitive assumptions; enhances metacognitive strategies and learning to learn to develop skills, cognitive strategies and communicative competence; lastly, this method raises self-esteem and security in learning, eliminating the psychological barriers that affect language acquisition.

The application of the ALDG has increased the methodological techniques and a balance has been achieved between the teaching of aspects of the language and the development of communicative competence. The student establishes significant links from what she knows to build knowledge and apply it in new contexts, deduces how the rules of the language work and learns from her own mistakes.

To correctly apply this learning method, students must be guided to use their skills and find the necessary norms and rules of the language to solve the learning tasks; delve into the way to acquire the content of the language with active methods; and prioritize the development of investigative skills.

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Also, the way in which ICTs are used in training is a form of guided discovery learning because strategies are developed to solve tasks and build knowledge.

The author of this research considers that the ALDG is used to guide the student to learn independently. This requires patience and effort from the teacher to assist and help students with materials and guides that stimulate the effort of discovery. The teacher must stimulate the development of habits of inquiry and study, dialogue, creativity, tolerance, critical capacity to analyze the contents in the socialization spaces where the solved tasks are shown, errors are critically analyzed and learning is done them (Zaldívar, 2016).

When conducting the ALDG, keep in mind that language works in real life and is learned in interpersonal interaction. This means that students must interact and exchange their experiences and personal and professional knowledge, after studying and working with the teaching materials.

The methodology for the development of oral expression in the EV3D must assume three of the methods used for language learning in virtual worlds because this environment has:

1. Spaces for social learning where students establish relationships of collaboration, cooperation and mutual help as they work in pairs, trios and teams and communicate synchronously and asynchronously. In this way they carry out virtual activities in real time and build their knowledge, Dogma.
2. Spaces with resources and learning activities based on tasks that the student studies to discover the linguistic elements that she needs to fulfill the communicative functions, ALDG.
3. Learning activities to transmit experiences on production and exchange knowledge on topics of the specialty, ALBT (Zaldívar, 2016).

The methodology for the development of oral expression in the EV3D "Learn in 3D" constitutes a novel way to develop oral expression in English. It is based on concepts and principles that stimulate collective intelligence and self-management of knowledge. Students are active actors in their learning and the teacher is the guide-organizer-facilitator (Zaldívar & Martínez, 2016).

The foundation is based on some concepts of the Historical-Cultural Approach, reflected in the didactic methods for language learning in virtual worlds assumed for the implementation of EV3D and the proposed methodology. These concepts are exposed in the following rationale:

- The educational nature of teaching and the active-conscious nature of learning;
- The mediation of consciousness in the regulation of action;
- Learning as a result of historical-social development, and educational conditions;
- The inter-psychological character of psychic processes;
- Teaching as a source of proximal development to acquire knowledge and develop communication skills, and learning as a result of that teaching;
- The scientific nature of the process of teaching foreign languages,
- The objective character to present the contents from the general to the particular.
- The assumed methods (Dogma, Task-Based Learning, Guided Discovery Language Learning) contribute to materialize these concepts in the following way:
- Active and conscious interaction between teachers and students and among the students themselves, such that help, collaboration and cooperation in the learning process are encouraged.
- The commitment of the students with the creation and socialization of the contents as a reflection of an active and conscious learning with an intra-psychological character and its respective inter-psychological influence.
- Learning as a social and dialogical process through which knowledge is built, as a reflection of the social nature of learning.
- Critical thinking when using materials in class and development of real tasks of the profession to stimulate problem solving, as a reflection of teaching as a source of development and learning as a result of teaching.
- Presentation of the content, not in its entirety, such that autonomous learning is stimulated in the self-management of knowledge (Zaldívar, 2016).

The foundation is also based on the characteristics of the educational resources developed and the learning activities designed according to the objectives of the Foreign Language V subject and the benefits of the EV3D and external tools.

In general, the methodology is based on the principle of mutual cooperation in a psychopedagogical environment that stimulates creative, entertaining, conscious and intelligent interaction and cooperation among the participants to advance to

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higher levels of learning according to collective and personal objectives. An appropriate student-student and student-teacher-content relationship is established.

The environment enables the socialization of the result of the independent study-work through the discussion of the course content, the simulation of workshops or seminars on topics of the specialty and the exchange of extra-class tasks. This interaction of the teacher with the students and between the students themselves allows the monitoring, assessment and evaluation of learning (Zaldívar, 2016).

The methodology applies concepts and principles of the communicative approach and three teaching methods used in virtual worlds (Dogma, Task-Based Learning and Guided Discovery Language Learning). The development of oral expression in English is achieved in a favorable learning psychopedagogical environment characterized by:

- Active students responsible for the construction of knowledge in constant cooperation and collaboration.
- A learning group organized in such a way as to establish cooperation and exchange in a favorable environment so that each student advances in their learning and perfects their command of the language.
- A space for the socialization of knowledge and tasks that contributes to the achievement of training objectives and progress in learning.
- The intra-psychological development of the student with the socialization and exchange of individual and collective experiences. Each student contributes what she knows and benefits from the contribution of her classmates.
- A teacher director, organizer and facilitator of the learning process, supported by educational and technological resources to guide independent study-work and achieve training objectives.

Online learning is based on the construction of knowledge through individual and social cognitive interaction. The internalization and transfer of knowledge are achieved at the request of social interaction from the virtual personal context.

These concepts are applied in the EV3D from connected learning to the interoperable virtual world with the course on the Moodle platform. The student builds knowledge from what he knows and in full collaboration with others, performs independent study-work and exchanges the result with the assistance, guidance and control of the teacher. Intelligence is collective and everyone's support is for everyone and constant (Zaldívar, 2016).

According to UNESCO (2008) within the standards of ICT competence, teachers need to be prepared to empower students with the advantages that ICTs bring them. Schools and classrooms, whether face-to-face or virtual, must have teachers who have the necessary ICT skills and resources and who can effectively teach the required subjects, while integrating their concepts and skills into their teaching. Interactive simulations, digital and open educational resources (OER), sophisticated data collection and analysis tools are some of the many resources that allow teachers to offer their students possibilities, previously unimaginable, to assimilate concepts, understand principles and assume theoretical frameworks in the different fields of knowledge.

According to Arteaga (2011) comments that one of the integrations of ICT in the field of education mostly implemented today is in the area of languages with the name of computer-assisted language learning (CALL, for its acronym). in English), as a new method that arises from the concern of professors and researchers to integrate the use of ICT in language teaching-learning processes. On the other hand, he comments that virtual learning allows interactivity and promotes motivation, efficiency and knowledge improvement in a flexible environment. Therefore, the most frequently used technologies at educational levels are computers, e-mail, and the Internet, and their application can be as varied as the circumstances of each institution allow.

With which we can conclude that the teaching-learning of a foreign language must be accompanied by the integration of technology to meet the need for students who have a B1 domain on the scale of the linguistic levels of the English language according to the Common Framework European Reference for Languages.

Morchio (2014) argues that due to the rise of new communication technologies, they have changed... (The) ways of knowing, thinking and learning (of students) and therefore they have to occupy vital space in training trajectories; school and college. Also, he comments that the pedagogical inclusion of technological resources is a difficult goal to achieve. In this sense, many of the pedagogical practices of teachers do not include ICT even when they are trained to implement them in the classroom, use them in their daily lives and the school offers the necessary infrastructure to do so. Thus, on many occasions the classes are organized from a subjectivity totally different from that of the real student, designed for a student who is not in that class.

The child who masters a language will not only be useful to practice in the supposed case of being able to go to another country one day, but "in situ", since the immense possibilities of establishing significant relationships with people from different countries. We have the possibility of interacting through email or chat within the reach of all schoolchildren from the moment they enter school (Parra & Galván, 2014).

## **Theoretical-Conceptual Framework of the Methodology for the Development of Language Competence in the Teaching of English as a Foreign Language at the Pre-University Level**

A series of authors have said that the end of the century and the entry into the new millennium are linked to a process of social, economic and political transformation, which can be said that we are not experiencing one of those periodic conjunctural crises of the capitalist model of development, on the contrary, we are experiencing the appearance of a new mechanism of forms of social, economic and political organization. It is also recognized that knowledge and information would be replacing natural resources and money as an entity in the generation and distribution of power in society. Knowledge would be the main source of power, which has important effects on the internal dynamics of society (Tedesco, 2011).

The depth of the cultural change is so significant that some authors tend to describe this period as a stage of great rupture. These changes are mainly associated with the rise of new information and communication technologies (ICT). These technologies have a significant impact on the set of social relations. The accumulation of information, the speed of transmission, the overcoming of spatial limitations, the simultaneous use of multiple media (image, sound, text) are, among others, the elements and factors that explain the enormous fertility of change presented by these new technologies. Its use forces to modify basic concepts such as those of time and space. The very notion of reality begins to be rethought, based on the possibilities of building virtual realities that pose unprecedented problems and questions of an epistemological nature, the analysis of which is just beginning (Tedesco, 2011). The knowledge society supposes new social, political and economic conditions that redefine the value system on which modernity was based and presents new challenges for educational organizations.

For Tedesco (2011) in a world where information and knowledge accumulate and circulate through increasingly sophisticated and powerful technological means, the role of the school must be defined by its ability to prepare for the conscious, critical, asset of the devices that accumulate information and knowledge. The main challenge of educational transformation is to manage the complexity of these processes and recognize the multiple dimension and the need to work with different and simultaneous sequences.

Rofle (2018) points out that the teacher does not teach his class in a glass bell, but rather develops his professional activity in an educational context determined by variables of time and space. Precisely the classroom reflects the changes experienced in society, which have impacted pedagogical subjects in different ways, which makes them approach (in the case of this communication) the English language from different subjectivities. This situation often leads to a decoupling in the classroom: in various instances, teachers implement didactic configurations that do not appeal to the media subjectivities of their students, a situation that does not contribute to their learning. This is equivalent to saying that the English teacher teaches a class for a student who is not present in the classroom.

ICTs have been naturalized in everyday life: cell phones, tablets, Skype, iPod, podcast, DVD, digital television, twitter, WhatsApp, text messages, tablets, cell phones, apps. It is difficult to find a member of society who does not use these resources to a lesser or greater degree. So if the classroom reflects the society in which we live, it is to be expected that ICTs have a leading role or at least exist in English classes at school. (Rofle, 2018)

This technology is based on a synchronous (instantaneous interaction between teachers and students) and asynchronous (intermittent interaction, deferred in time) work method, and offers a series of advantages, such as greater student motivation, the promotion of the individual process learning, immediate feedback and non-linear access to information.

### **ASSESSMENT OF LANGUAGE PROFICIENCY LEVELS ACCORDING TO THE EUROPEAN FRAMEWORK OF REFERENCE FOR LANGUAGES**

The Common European Framework of Reference provides a common basis for the development of language programs, curricular guidelines, exams, manuals, etc., throughout Europe. It describes in an integrative way what language students have to learn to do in order to use a language to communicate, as well as the knowledge and skills they have to develop in order to act effectively. The description also includes the cultural context in which the language is situated. The Framework of Reference also defines levels of proficiency in the language that allow checking the progress of students in each phase of learning and throughout their lives.

The Framework of Reference is intended to overcome the barriers produced by the different European educational systems that limit communication between professionals working in the field of modern languages. By offering a common basis for the explicit description of objectives, content and methodology, the Reference Framework favors the transparency of courses, programs and qualifications, thus promoting international cooperation in the field of modern languages. . The presentation of objective criteria that describe language proficiency will facilitate the mutual recognition of qualifications obtained in different learning contexts and, consequently, will contribute to mobility in Europe.

The Framework includes the description of 'partial' qualifications, which are appropriate only where a narrower knowledge of the language is required (for example, for listening rather than speaking), or where a limited number is available of time for

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learning a third or fourth language and perhaps more useful results can be achieved by aiming, for example, at recognition rather than retrieval skills. Giving formal recognition to these abilities will contribute to the promotion of bilingualism through the learning of a greater variety of European languages. (Cervantes, 2002).

### **THE VERTICAL DIMENSION TO THE REFERENCE FRAMEWORK, ALLOWS DESCRIBING OR DRAWING THE PROFILE OF THE LEARNING SPACE, ALBEIT IN A SIMPLE WAY, WHICH IS USEFUL FOR SEVERAL REASONS**

The development of definitions of the student's command of the language, related to the categories used in the Framework of Reference, can help specify what is expected to be appropriate at different levels of achievement based on those categories. This, in turn, can contribute to the development of transparent and realistic specifications regarding the overall learning objectives.

Learning that takes place over a period needs to be organized into units that take progression into account and can provide continuity. Curricula and materials need to be interlinked, and a tiered framework can help this process.

The learning efforts related to these objectives and these units must also be located in this vertical dimension of progress, that is, they must be evaluated in relation to the achievement in the domain of the language. Having language proficiency specifications contributes to this process.

Such assessment should take into account incidental learning, experience outside the classroom, and the type of collateral enrichment described above. In this regard, it may be useful to have a set of language proficiency specifications that goes beyond the scope of a particular study programme.

Having a common set of language proficiency specifications makes it possible to compare objectives, levels, materials, tests and achievement levels in different systems and situations.

A framework that includes both the horizontal and vertical dimensions makes it possible to define partial objectives and recognize unequal profiles and partial competencies.

A framework of levels and categories that facilitates the description of objectives for specific purposes can help inspectors. Such a framework can make it possible to assess whether students are working at an appropriate level in different areas; it can also inspire decisions about whether action in these areas represents an appropriate model for the learning phase, as well as suggest immediate and longer-term goals for effective language proficiency and personal development.

Finally, in their learning trajectory, language learners pass through various educational sectors and institutions that offer language services, and the existence of a common set of levels can facilitate collaboration between these sectors. With the increase in personal mobility, it is increasingly common for students to change education systems at the end of their studies or even in an intermediate stage, so having the possibility of having a common scale that describes their achievement becomes on a matter of increasing interest.

When considering the vertical dimension of the Framework, it should not be forgotten that the language learning process is continuous and individual. Not even two users of the same language, whether they are native speakers or foreign students, have exactly the same skills or develop them in the same way. Any attempt to establish levels of proficiency in the language is to some extent arbitrary, as it is in any area of knowledge or skill.

However, for practical reasons it is useful to establish a classification of defined levels that segment the learning process to respond to the needs of curriculum design, exams, etc. Their number and magnitude will generally depend on how a particular educational system is organized and for what purposes the scales are established. It is possible to establish procedures and criteria to carry out the grading and to formulate the descriptors used in the characterization of successive levels of language proficiency.

Also remember that levels reflect only a vertical dimension. Therefore, they can only explain to a limited extent the fact that language learning involves both horizontal and vertical progress whereby learners acquire the mastery to engage in a wider range of communicative activities.

Progress is not simply about moving up a vertical ladder. There is no logical and concrete requirement for a student to go through all the lower levels of a subscale. She may have collateral progress (from a parallel category) by extending her acting abilities rather than increasing her command of the language in the same category. Conversely, with the expression "deepen our knowledge", it is recognized that we may once feel the need to support such pragmatic improvements by looking back to "the basics" or " (ie lower level skills) in an area where we have moved laterally.

No existing scale or system of levels can claim to be linear in this sense. Taking into account the series of content descriptions made by the Council of Europe, although the Platform level (Waystage) is located halfway to the Threshold level on a scale of levels, and the latter is halfway to the Advanced level (Vantage), experience with current scales suggests that many students will take more than twice as long to reach Threshold from Platform than it will take to reach Platform; then, it is likely that it takes



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more than twice as long to reach Advanced from Threshold as it took to reach Threshold from Platform, even though the levels appear equidistant on the scale.

This is so due to the necessary expansion of the set of activities, skills and linguistic elements that it entails. This practical fact is reflected in the frequent representation that is made of a scale of levels in the form of a diagram that resembles a cornet, a three-dimensional cone that widens upwards. When using any level scale, extreme caution must be exercised when calculating the average time needed to achieve specific objectives (Cervantes Virtual Center, 1999 - 2020).

### CONCLUSIONS

After an analysis of the state of the art regarding the thematic object of study, it can be affirmed that:

Developing the linguistic level of the English language at level B2 of the Common Framework of Reference for Languages is essential for the success of learning English as a foreign language at the pre-university level, but they require an appropriate methodology that allows integrating pedagogical and technological components, in order to obtain the expected results with this synergy.

There are several tools, frameworks, computer applications and methodological indications that can be part of a technological infrastructure to develop English language skills in pre-university education.

A methodology to develop language skills in pre-university education must take into account the generic characteristics that the tools that take part in the teaching-learning process must present and a group of criteria that support the technological selection. It must also have elements that support the centralization of security in applications that consume educational computing resources. In correspondence with the demands of the sociocultural context and constitutes one of the social needs to be satisfied today, so the proposed methodology must correspond to these demands.

### RECOMMENDATIONS

- Implement certain methodologies for the development of pedagogical and technological components to increase linguistic competence in the formation of English as a non-native language.
- Establish the tools, computer applications to create a technological infrastructure that develops language skills in educational institutions.
- Apply the necessary elements for the security of computer resources during their use, which are currently required.

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## **Hardware, Hard Time: Academic Challenges and Coping Mechanism of Marginalized Senior High School Students during Distance Learning**



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**ABSTRACT:** This study determined the academic challenges and coping mechanisms of marginalized senior high school students in distance learning, during the second semester of School Year 2021-2022. It was conducted at Porais National High School in the Division of San Jose City. The respondents were six marginalized senior high school students. An interview was conducted in gathering data. The gathered data were presented, and these were scrutinized based on the research questions. The respondents identified lack of internet connectivity and lack of immediate guidance of teachers as their main challenge in distance learning. To seek help and ask for neighbors to be connected to the internet (if there's any) were the identified coping mechanisms of students.

**KEYWORDS:** Distance learning, Marginalized, Senior High School, Academic Challenges, Coping Mechanism.

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### **INTRODUCTION**

The COVID-19 pandemic brought challenges in economic, social and political aspect of a country across the globe. Education, among others is one of the most affected sectors. According to UNESCO Learning Portal (2020), a total of 1.52 billion students were absent from school or other relevant educational institutions, representing 87 percent of the global student population. COVID-19's suddenness, ambiguity, and volatility forced the educational system to react quickly to the new learning landscape. During the initial COVID-19 boom in March 2020, just weeks before the end of the academic year, the Philippines has discontinued in-person instruction for its entire cohort of 24.9 million public school students, according to UNESCO. "No vaccine, no classrooms", was an order issued by President Rodrigo Duterte, delaying the beginning of the new school year until October. The Department of Education (DepEd), through its secretary, Leonor M. Briones, said that the education must continue. Education undersecretary Diosdado San Antonio continued, "[Education secretary Leonor Briones] always reminds us that schooling continued even through military sieges, volcano eruptions, earthquakes, typhoons, and floods." In line with this statement, the Department of Education crafted DepEd Order no. 18, series of 2020 entitled Policy Guidelines for the Provision of Learning Resources in the Implementation of the Basic Education Learning Continuity Plan. This DepEd Order, has been used as the basis for the continuation of the program amidst the pandemic. DepEd formulated different learning modalities suitable for the students. Online, modular, digital learning were some of the learning modalities introduced by the Department of Education.

Indeed, education continued, but this continuation also paved way on many challenges to the students. This study aimed to know the academic challenges and coping mechanism of marginalized senior high school students.

### **OBJECTIVES OF THE STUDY**

This study aimed to know the experience of marginalized senior high school students during distance learning. This research specifically addressed the following issues:

1. How do marginalized senior high school students described their academic difficulties during the transition period?
2. What mechanism do they employ to cope up with the academic challenges during the transition period?

### **MATERIALS AND METHODS**

The study used the phenomenological approach to explore experience of marginalized senior high school students. Phenomenology examines the organization of a variety of experiences, including language activity as well as bodily awareness, embodied action, and social interaction. These experiences include perception, thinking, memory, imagination, emotion, desire,

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and volition (Smith, 2016). So, it is concerned with how people understand, perceive and make use of different phenomena. The focus is also more on the individual and how he or she experiences it, with limited interest to the social environment (Pilerot & Hedman, 2009)

The researcher created interview questions to aid him in gathering all of the participants' experiences and viewpoints on the topic. Their categories were used to split the questionnaire.

The researcher interviewed six (6) marginalized senior high school students enrolled in Porais National High School. Narrative approach was applied. The interview was conducted at the participants' most convenient time.

All of the interviews were taped on a digital voice recorder and then transferred to the researcher's computer. The information is kept on a password-protected computer in a secured home office.

Data analysis entailed reading verbatim detailed transcripts. The analysis was supported by quotes from the conversations. The subsequent sections of this chapter present the findings of raw data analysis.

Moustakas's (1994) psychological or transcendental phenomenology was used minimally on the interpretations of the researcher and more on a description of the experiences of participants. Moustakas concentrated on one of Husserl's ideas, epoch (or 26 bracketing), in which researchers try to put their past experiences aside to approach the phenomenon they are studying from a new perspective. The steps, as demonstrated by Moustakas, involved selecting a phenomenon to examine, bracketing out one's experiences, and gathering information from several people who had encountered the event. The data was then broken down into key quotes or assertions by the researcher, who subsequently organized the quotes into themes. After that, the study created a textual description of the participants' experiences (what they went through), a structural description of their experiences (how they went through it in terms of the circumstances, situations, or context), and a combination of the textual and structural descriptions to convey the experience's overall feeling.

## **RESULTS AND DISCUSSION**

### **Academic Challenges of Marginalized Students**

All the participants identified challenges that hinder them in achieving their full potential as students in distance learning especially, online classes. The respondents identified different challenges that hinder them from learning through online modality. First challenge encountered by the respondents, especially those who belong to marginalized sector is lack of internet connectivity, this also include the lack of cellular load. Since most of the respondents are living in rural area, internet connectivity is their main concern because internet line was not available and due to geographic location of their houses, cellular signal is not strong. This study is confirmed by Cabual & Cabual (2022) which explained that noise/environmental distractions, technical issues, and slow internet connections were the topmost challenges encountered by the students. This is also similar to the study of Klawitter (2022) saying that distractions everywhere, staying motivated, technical issues, some students being left behind and diminished social aspects are the top five challenges faced by students in online learning. However, the result was negated by the study conducted Barrot, Llenares & del Rosario (2021) which they explained that it was the related learning environment at home and not the technical issue, which the greatest problem in online learning. This only means that students' online learning problems differed in form and magnitude.

Moreover, last identified challenge by the respondents in online learning is lack of the guidance of teachers. Some respondents said that absence of their teacher made it harder for them to learn. Although teachers are present in online classes, it was the technical issues that made harder for the students. Due to their geographical location, signals are not that strong. During online classes, students are being disconnected which lead to being absent in online class, having said that, the intervention is for them to answer activities in module. Without the guidance of the teacher, it is hard for them to learn. This claim is supported by the study of Challenges of Distance Learning for Students (2021), they emphasized that one of the challenges for the students in distance learning is lack of instant communication. Communication is very important in a teaching-learning process as it is the way for the students to interact with their teachers and also important for teachers to ask if the students have questions or not. This communication is hinder because of technical issues. Similarly, the study of Klawitter (2021) emphasizes that one of the top five challenges in online learning is technical issues.

### **Coping Mechanism of Marginalized Students**

Majority of the respondents displayed a tremendous amount of positivity despite the challenges they identified. They employed different coping mechanism to overcome these challenges and they are successful in overcoming it. On their identified challenge, lack of guidance of teachers due to technical issues, their coping mechanism employed was to seek help. Majority of the respondents said that they are asking for help to their parents or friends. This shows positivity to the respondents because they

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recognize their challenges and they are not shy to ask help with other people. On the second identified challenge, which is the lack of internet connectivity. One of the respondent coping mechanisms in this identified challenge is that she asked her neighbor to connect her to the internet which shows tremendous positivity. This shows that the respondent is resourceful enough to find a way in addressing her problems and it shows that the respondent will do everything to achieve the respondent's dream.

These claims or results is agreed by the study conducted by Nyatsanza & Mtezo (2013). The study explained that seeking social support is one of the top eight coping mechanisms employed by the students when dealing with their problems. This is also similar to the study conducted by Kar, Kar, & Kar (2021), which explained that expressing to other people by telling their problems is one of their coping mechanisms.

### CONCLUSION AND RECOMMENDATION

The conclusions that were reached considering the findings were as follows:

1. Online classes are stressful and not everyone's cup of tea. Online classes give challenges to the students in learning as well as in achieving their dreams. This study identified all the challenges of respondents in online learning that can be addressed by the authority.

2. All of the respondents employed coping mechanism that helped them overcome the identified challenges especially in their academic life amidst the pandemic

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## The Effect of Non-Financial Factors on Firm Value with Tax Aggressiveness as Moderating



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**ABSTRACT:** There are still many problems with company value in Indonesia. This study aims to analyze the effect of non-financial factors on firm value. In addition, this study also examines tax aggressiveness as moderating the influence of non-financial factors on firm value. The sample used in this study is a real estate company listed on the Indonesia Stock Exchange for the period 2018 – 2020. The analytical method used is multiple linear regression, including classical assumption test, coefficient of determination test, hypothesis testing and moderate regression analysis. Statistical tool used by using Statistical Product and Service Solution Version 23.

the audit committee has a positive and significant effect on firm value. Meanwhile, the independent commissioner and family ownership variables have no significant effect on firm value. Moderation test proves that tax aggressiveness cannot moderate the effect of independent commissioners, audit committees and family ownership on firm value.

**KEYWORDS:** non-financial, firm value, tax aggressiveness.

### INTRODUCTION

In today's economic growth, competition between companies is getting tougher, companies are required to be able to change themselves to be stronger and have a competitive advantage in their industry. In implementing the strategy to achieve competitive advantage, the company must face many obstacles, one of which is in terms of funding. Issuance of shares is the most effective way to obtain funds, the more shares invested in the company, the greater the value of shares which is a reflection of the value of the company.

High company value is always a desire for company owners, because companies that have a high level of company value are considered to be able to prosper shareholders and this can attract investors to invest in the company. The rise and fall of the value of the company can be seen from its share price, the higher the stock price of a company, the higher the value of the company and vice versa, the lower the stock price, the lower the value of the company (Hutomo et al., 2020).

The performance of stocks in the property sector was the weakest among other stocks on the Indonesia Stock Exchange. Based on data from the Indonesia Stock Exchange, the Property & Real Estate sector index performance was the worst by sector with a correction of 14.91% until trading. Head of Equity Trading MNC Sekuritas Medan Frankie Wijoyo Prasetyo said the sluggish performance of the property and real estate sectors did not only occur this year, but was indeed in the middle of a downtrend for at least the past 5 years. According to him, this started with an indication of a potential property bubble in Indonesia about 5 years earlier. At that time property prices rose dramatically, making developers continue to build properties and sell them at premium prices. Not yet had time to rise, the pandemic also hit the property and real estate sectors. Policies such as large-scale social restrictions (PSBB), for example, suppress the performance of issuers that have recurring income business lines from their rental properties, such as malls and offices (bisnisindonesia.id).

In this study, the value of the company is measured using price to book value (PBV), which is the ratio of the share price to the book value of the company. This ratio is used because with this ratio it can be seen whether the stock price level is overvalued or undervalued from the book value, so that it can assess the high or low value of the company as reflected in the stock price (Ayu & Suarjaya, 2017).

Many researchers have researched the firm value of the company. Firm value is output from investor reaction in market share (Triani & Tarmidi, 2019). Melinda & Wardhani (2020), examined the environmental, social and governance index (ESG index) on firm value in 22 countries in Asia. Temiz, (2021) found that the value of the company in Turkey will increase if the company

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makes high corporate disclosures. Zamzamir et al. (2021) examining firm value in companies listed on the Malaysian stock exchange found that hedging and managerial ownership have an effect on firm value. If we look at some of the previous studies that have been found, it can be concluded that there are non-financial factors that affect firm value (Melinda & Wardhani, 2020; Temiz, 2021; Zamzamir et al., 2021).

An example of research on firm value in Indonesia, Ibrahim et al. (2020) found that firm value is influenced by the firm's level of leverage. In addition, Hutomo et al., (2020) found that firm value is influenced by the level of firm liquidity. Seeing from previous research that firm value can be influenced by financial factors (Hutomo et al., 2020; Ibrahim, 2020). Firm value can also be influenced by non-financial factors. Non-financial factors are several factors related to non-monetary.

The non-financial factors that will be examined in this study are independent commissioners, audit committees and family ownership. Independent commissioners play an important role in the implementation of Good Corporate Governance, such as ensuring the company's strategy, supervising managers in managing the company, requiring the implementation of accountability, and providing guidance in managing the company (Handriani, 2020). Bhat et al.,(2018) in their research results that independent commissioners have a significant positive effect on firm value on the Pakistan stock exchange. According to Pernamasari & Mu'minin (2019) that independent commissioner has a positive effect on firm value. This research was supported by Ing Malelak et al., (2020). The results of this study contradict (Handriani, 2020; Hasanah et al., 2019) that independent commissioners have no effect on firm value.

The audit committee plays an important role in the value of the company. The responsibility of the audit committee is to provide assurance that the company has complied with applicable laws and regulations as well as to exercise effective control over conflicts of interest that will harm the company and reduce the value of the company (Rashid et al., 2018). Agyemang-Mintah & Schadewitz (2018) examines the effect of audit committees on firm value in Nigeria. This research is supported by Risa & Sati (2021) and Rashid et al., (2018), but contradicts the results of Handriani's (2020) research which explains that the audit committee has no effect on firm value.

Another non-financial factor is family ownership. According to Muntahanah et al., (2021), company ownership in Indonesia is generally concentrated in a group of individuals, families, or ownership through other companies. This condition is especially found in national companies where family ownership controls the public company. Family ownership has almost complete control over the company with business groups owned by the family. Mai & Hamid (2021) have research results that family ownership has a negative and significant effect on firm value. This research is supported by the results of Muntahanah et al. (2021). Demsetz & Lehn, (2009) also support this negative relationship, suggesting that families can pursue personal gains from money control. Juwita (2019) and Ing Malelak et al., (2020) have different results, namely family ownership has a negative effect on firm value.

This study focuses on non-financial factors that affect firm value. In addition, this study uses tax aggressiveness as a moderating variable. In this study, a moderating variable was added because of the inconsistency of research results between independent variables in the form of non-financial factors on firm value. The purpose of this study was to determine the financial and non-financial factors on firm value. In addition, it also sees the effect of tax aggressiveness as a moderating variable which is expected to strengthen the relationship between financial and non-financial factors on firm value.

## **LITERATURE**

### **Effect of Independent Commissioners on Firm Value**

The Independent Commissioner aims to balance decision making, especially in the context of protecting minority shareholders and other related parties. The increase in the number of independent commissioners indicates that the independent board of commissioners performs a good supervisory and coordinating function within the company (Hasanah et al., 2019). The results of research conducted by Ing Malelak et al., (2020) and Handriani, (2020) explain that independent commissioners have a positive and significant effect on firm value. The higher the composition of independent commissioners in the company, the board of commissioners can play a more effective role in supervising and providing advice to the board of directors, thereby increasing the value of the company. Based on this description, the proposed hypothesis is:

H1: Independent commissioners have a positive and significant effect on firm value

### **Influence of the Audit Committee on Company Value**

The audit committee is a group of people elected from the company's board of commissioners who are responsible for assisting the auditors in maintaining their independence from management. The audit committee provides insight into accounting issues, financial reporting and explanations, internal control systems as well as independent auditors in a company. Thus, the audit committee has a very important and strategic role in terms of maintaining the credibility of the financial reporting process which

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is very much needed to create investor confidence which has an impact on company value. Research from Agyemang-Mintah & Schadewitz (2018) states that the audit committee has a positive effect on firm value. This research is supported by Risa & Sati (2021) and Rashid et al., (2018). Based on this description, the proposed hypothesis is as follows:

H2: The audit committee has a positive and significant effect on firm value

### Effect of Family Ownership on Company Value

Family ownership has a negative impact on the company's market valuation. This study shows that family firms have lower financial performance than non-family firms (Muntanah et al., 2021). Demsetz & Lehn (2009) state that families can pursue personal gain from money control. According to the theory of competitive advantage, the presence of family ownership can reduce agency costs and improve company performance, while family ownership will destroy the value creation of the company from the perspective of personal gain (Mai & Hamid, 2021). Based on the description above, the proposed hypothesis is:

H3: Family ownership has a negative and significant effect on firm value.

### Tax aggressiveness weakens the influence of independent commissioners on firm value

Independent commissioners are parties who are not affiliated with the controlling shareholder, other members of the board of directors and commissioners. The presence of the board of commissioners can improve supervision of the performance of the board of directors, where the increasing number of independent commissioners, the supervision of the management will be more stringent. The high level of tax aggressiveness in the company can create a negative view for investors because it will lead to the assumption that there will be tax risks in the future (Prastiwi & Walidah, 2020). With the tax aggressiveness will have a negative effect on the value of the company. On this basis, the proposed hypothesis is:

H4: Tax aggressiveness weakens the positive influence of independent commissioners on firm value.

### Tax Aggressiveness Weakens the influence of the Audit Committee on Company Value

An independent professional working audit committee formed by the board of commissioners thus has the task of assisting and strengthening the function of the board of commissioners or supervisory board in carrying out the oversight function (oversight) on the financial reporting process, risk management, audit implementation and implementation of corporate governance in companies. (Risa & Sati, 2021).

The audit committee can monitor mechanisms that can improve the quality of information for company owners or shareholders and company management (Damayanti & Susanto, 2016). Tax aggressiveness actions taken by company management can have a negative effect on firm value (Septyaningrum, 2020), so that the existence of tax aggressiveness actions can weaken the influence of the audit committee on firm value.

H5: Tax aggressiveness weakens the positive influence of the audit committee on firm value.

### Tax Aggressiveness strengthens the influence of Family Ownership on Company Value

The presence of family ownership can reduce agency costs and improve company performance, while family ownership will destroy the value creation of the company from the perspective of personal gain (Mai & Hamid, 2021). Tax aggressiveness through saving the tax burden paid by the company will benefit family ownership. Based on this, tax aggressiveness will strengthen the effect of tax aggressiveness on firm value. The proposed hypothesis is:

H6: Tax aggressiveness strengthens the negative effect of family ownership on firm value.

## METHOD

In this research, the type of research used is causal research. The independent variables in this study include independent commissioner, audit committee and family ownership. Meanwhile, the dependent variable in this study is firm value. This study also uses tax aggressiveness as a moderating variable.

The sample of this research is 30 companies listed on the IDX in 2017-2019. The sample of this study used a purposive sampling method of 60 company data. The data collection technique used for this research is the data source documentation technique using secondary data, namely company documents in the form of financial reports published on [www.idx.co.id](http://www.idx.co.id) and the respective company websites. Data analysis was performed using quantitative data, which is an analysis of the data required for the data obtained, then analysis is carried out based on statistical methods and the data is put into certain tables using tables to make it easier to analyze. Multiple linear analysis is used to obtain regression coefficients that will determine whether the hypothesis made will be accepted or rejected on the basis of the results of regression analysis using a significance level of 0.05 or 5% and to determine whether there is an influence of the independent variable on the dependent variable. The multiple linear regression equation used in this study is formulated as follows:

$$NP = \alpha + \beta_1KI + \beta_2KA + \beta_2FO + e \dots \dots \dots (i)$$

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$$NP = \alpha + \beta_1KI + \beta_2KA + \beta_3FO + \beta_4KI*TA + \beta_5KA*TA + \beta_6FO*TA + e \dots \dots (ii)$$

This study uses SPSS 25 to determine the results of the study. To test the effect of moderation, a moderating variable interaction test was carried out using moderated regression analysis (MRA), in which the regression equation contains an element of interaction (multiplication of two or more independent variables).

### RESULT AND DISCUSSION

#### Result

##### Statistic Descriptive

The sample of this study amounted to 32 companies. This study used the 2018-2020 research period and the number of samples in the study that matched the research criteria was 96 samples. Of the 32 companies for 3 years used in this study, the following in table 5.1 are descriptive statistics of the variables used in this study. It can be seen that the Liquidity variable (Current Ratio) in this study has a standard deviation value that is greater than the average, except for the variables Leverage, Independent Commissioner, Audit Committee, Family Ownership, Tax Aggressiveness and Company Value. To be more clear can be shown as follows:

**Table 1. Statistic Descriptive**

	Minimum	Maximum	Mean	Std. Deviation
Firm Value	0.0778	4.7348	0.913639	0.8497050
Independent Commissioner	0.1667	0.8000	0.412326	0.1117902
Audit Committee	2	4	3.04	0.353
Family Ownership	0	1	0.45	0.500
Tax Aggressiveness	0.5417	14.8787	9.657416	2.9078749

Source: Primary Data. 2022

In table 1 above, it is known that the variable in the study is firm value which has a minimum value of 0.0778, with a maximum value of 4.7348, the average firm value of 96 observational data is 0.913639 with a standard deviation of 0.8497050. In this study there are as many as 3 independent variables, namely the Independent Commissioner, the Audit Committee and Family Ownership. The Independent Commissioner variable has a minimum value of 0.1667, a maximum value of 0.8000, an average value of 0.412326 with a standard deviation of 0.1117902. The Audit Committee variable has a minimum value of 2, a maximum value of 4, an average value of 3.04 with a standard deviation of 0.353. The Family Authority variable has a minimum value of 0, a maximum value of 1 and an average value of 0.45 with a standard deviation of 0.500. This study uses a moderating variable, namely Tax Aggressiveness which has a minimum value of 0.5417 and a maximum value of 14.8787, the average value of this variable is 9.657416 with a standard deviation of 2.9078749.

#### Coefficient Determination

**Table 2. Coefficient Determinant Test**

Model	Adjusted R Square
Model 1	0,081 → 8,1%
Model 2	0,113 → 11,3%

Source: Primary Data. 2022

Based on table 2 above, it is a test of the coefficient of determination where there are 2 models, namely the research model without a moderating variable and with a moderating variable. From the test results, the value of adjusted R Square model 1 (without moderation) is 8.1%. This means that the independent variables in this study, namely the Independent Commissioner, the Audit Committee and Family Ownership have an effect of 8.1% on the dependent variable (Company Value); while the remaining 91.9% is influenced by factors outside model 1.

The second research model is to examine the effect of the moderating variable, namely Tax Aggressiveness. The value of the adjusted R-square test results when combining moderating variables is 11.3%. It can be concluded that the moderating variable has a strong enough influence on the research model.

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Table 3. F-Test

Model	F-stat.	Significance	Conclusion
Model 1	3.808	0,010	Fit-model
Model 2	3.011	0,010	Fit-model

Source: Primary Data. 2022

Based on the results of the simultaneous significance test of F model 1 (without moderating variables) of 0.010. The results of this test  $<0.05$ , so it can be concluded that simultaneously (simultaneously) all independent variables have a significant influence on the dependent variable. Thus, this regression model is concluded to be a goodness of fit. The results of the F-test significance test for the 2nd model (with moderating variables) is 0.0101. In this case the research model is fit or worthy to be tested.

### Hypotheses Testing

Table 4. Hasil Uji Parsial T-Test dan Moderate Regression Analysis

Variable	Prediction	Coefficient	Std. Error	t-Statistic	Sig.
Constant		-0.1254	0.732	1.889	0.062
Independent Commissioner	+	0.091	0.495	0.919	0.361
Audit Committee	+	0.263	2.446	2.641	0.010
Family Ownership	-	0.125	1.726	1.251	0.214
Independent Commissioner*TA	-	0.076	0.000	0.156	0.877
Audit Committee*TA	-	-0.497	0.295	-0.601	0.549
Family Ownership*TA	+	0.662	0.834	0.851	0.397

Source: Primary Data. 2022

Based on the results of the partial T-Test in table 5.5, it shows that the Independent Commissioner variable has a significance value of 0.361 which means it is greater than 0.05, so it can be concluded that the Independent Commissioner variable has no significant effect on Firm Value (H1 is rejected). The Audit Committee variable with a significance value of 0.010 also shows a value less than 0.05, meaning that the Audit Committee has a significant positive effect on Firm Value (H2 is accepted). The result of the significance value of the Family Ownership variable is 0.214 which is greater than 0.05, so it can be concluded that Family Ownership has no significant effect on Company Value (H3 is rejected).

To test the effect of the moderating variable between Tax Aggressiveness and Independent Commissioner on Company Value, it has a significance value of 0.877 which is greater than 0.05 so it can be concluded that Tax aggressiveness cannot weaken the relationship between Independent Commissioners and Company Value (H4 Rejected). The same result is also shown on the effect of Tax Aggressiveness which weakens the relationship between the Audit Committee and Company Value with a significance value of 0.549 (greater than 0.05) so it can be concluded that H5 is rejected. The 6th hypothesis is rejected because the significance value of the test of the moderating variable of Tax Aggressiveness with Family Ownership is only 0.397 so that it can be concluded that Tax Aggressiveness cannot strengthen the influence of Family Ownership on Firm Value.

## DISCUSSION

### The Influence of Independent Commissioners on Company Value

The Independent Commissioner aims to balance decision making, especially in the context of protecting minority shareholders and other related parties. The increase in the number of independent commissioners indicates that the independent board of commissioners performs a good supervisory and coordinating function within the company (Hasanah et al., 2019). However, based on the results of the study indicate that H1 is rejected, namely the Independent Commissioner has no significant effect on Firm Value. This proves that the role of the Independent Commissioner in the sample companies does not affect the Firm Value. The Independent Commissioner is not a member of management, majority shareholder, official or in other words relates directly or indirectly to the majority shareholder of a company that oversees the management of the company so that it does not greatly affect the condition of the company's value.

The results of this study are in line with the results of research by Handriani (2020) and Hasanah et al., (2019) that independent commissioners have no effect on firm value. However, the results of this study contradict the results of research by Ing Malelak et al., (2020) and Handriani, (2020).

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### **Influence of the Audit Committee on Company Value**

Based on the results of hypothesis testing, it shows that H2 is accepted, that the Audit Committee has a significant positive effect on Firm Value. The audit committee is a group of people elected from the company's board of commissioners who are responsible for assisting the auditors in maintaining their independence from management. The audit committee provides insight into accounting issues, financial reporting and explanations, internal control systems as well as independent auditors in a company. Thus, the audit committee has a very important and strategic role in terms of maintaining the credibility of the financial reporting process which is very much needed to create investor confidence which has an impact on company value.

The results of this study are supported by Agyemang-Mintah & Schadewitz (2018), Risa & Sati (2021) and Rashid et al., (2018) which state that the audit committee has a positive effect on firm value. However, this study contradicts the results of the study but contradicts the results of Handriani's (2020) research.

### **The Effect of Family Ownership on Company Value**

Based on the results of the hypothesis test, it is shown that family ownership does not have a significant effect on firm value (H3 is rejected). These results indicate that family ownership does not necessarily give a negative contribution to company value. The results of this study prove that the company in which there is a family relationship does not affect the firm value of the sample company. In this study, the sample companies proved that proper internal control from the audit committee could control the company in such a way even though there was a family relationship in the company.

The results of this study are in line with Juwita (2019) and Ing Malelak et al., (2020) namely family ownership has no effect on firm value. However, contrary to the results of Muntahanah et al., (2021) and Mai & Hamid (2021).

### **Tax Aggressiveness Weakens the Influence of Independent Commissioners on Company Value**

Based on the results of the moderation test, H4 is rejected, meaning that the Tax Aggressive variable cannot moderate or cannot weaken the influence of the Independent Commissioner on Company Value. The high level of tax aggressiveness in the company can create a negative view for investors because it will lead to the assumption that there will be tax risks in the future (Prastiwi & Walidah, 2020), however, this view will be accommodated if the company implements good governance. Good governance will describe the company carrying out one of the supervisions, for example through the role of an independent commissioner. The Independent Commissioner will supervise and control management actions regarding tax risks in the future.

The results of this study are supported by Firmansyah (2021) who explains that tax aggressiveness has no significant effect on company value. However, the results of this study contradict those of Suprihatin & Olivianda (2021) who explain that tax aggressiveness has an effect on firm value.

### **Tax Aggressiveness Weakens the Effect of the Audit Committee on Company Value**

Based on the results of the moderation test, it shows that H5 is rejected, namely Tax Aggressiveness cannot moderate or cannot weaken the influence of the Audit Committee on Company Value. An independent professional working audit committee formed by the board of commissioners thus has the task of assisting and strengthening the function of the board of commissioners or supervisory board in carrying out the oversight function on the financial reporting process, risk management, audit implementation and implementation of corporate governance. The tax aggressiveness actions taken by the management are proven not to affect the value of the company due to good internal control by the audit committee.

The results of this study are supported by Firmansyah (2021) who explains that tax aggressiveness has no significant effect on company value. However, the results of this study contradict those of Suprihatin & Olivianda (2021) who explain that tax aggressiveness has an effect on firm value.

### **Tax Aggressiveness Weakens the Effect of Family Ownership on Company Value**

Based on the results of the moderation test, it shows that H6 is rejected, namely Tax Aggressiveness cannot moderate or cannot weaken the influence of Family Ownership on Company Value. The presence of family ownership can reduce agency costs and improve company performance, while family ownership will destroy the value creation of the company from the perspective of personal gain (Mai & Hamid, 2021). Tax aggressiveness through saving the tax burden paid by the company is not proven to benefit family ownership. Based on this, tax aggressiveness is not proven to strengthen the effect of tax aggressiveness on firm value

The results of this study are supported by Firmansyah (2021) who explains that tax aggressiveness has no significant effect on company value. However, the results of this study contradict those of Suprihatin & Olivianda (2021) who explain that tax aggressiveness has an effect on firm value.



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### CONCLUSION

Based on the results of the research and discussion in the previous section, it can be concluded that the audit committee has a positive and significant effect on firm value. Meanwhile, the independent commissioner and family ownership variables have no significant effect on firm value. Moderation test proves that tax aggressiveness cannot moderate the effect of independent commissioners, audit committees and family ownership on firm value.

This study still has several shortcomings, including the research period is only three years of observation and the sample used is only limited to real estate companies on the Indonesia Stock Exchange. For further research, it is possible to increase the research period, and to sample other companies. In addition, further research can also use other measurement indicators of tax aggressiveness by using other measurements such as book tax different.

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## The Status of Moroccan High School Students' Environmental Knowledge



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**ABSTRACT:** This paper examines the status of Moroccan high school students' environmental knowledge. It aims to test the level of students' knowledge regarding a range of factual and conceptual knowledge of topics related to local and global environmental issues which high school students are supposed to know. The study adopted a quantitative research design and the research sample was made of 524 female and male students belonging to eight public and private high schools in the city Agadir and the suburbs. The descriptive statistics of the knowledge test's scores revealed that students demonstrated insufficient degrees of environmental knowledge both at the levels of factual and conceptual questions. Meanwhile, the results were also indicative of the absence of positive or negative correlations between students' environmental knowledge and their age, gender, stream, school type and grade. Finally, this paper suggests ways to boost students' environmental knowledge to improve their pro-environmental attitudes and behaviors.

**KEYWORDS:** Environmental education, environmental knowledge, students, Morocco.

### INTRODUCTION

More than any time before, the world cannot overlook the emergent need to reconsider human behavior towards nature and the environment and positively respond to startling challenges such as the issue of natural resources, energies, global warming, climate change, and pollution. Given the generally held fact that schools can be critical in shaping our thoughts and behaviors (Henderson & Tilbury, 2004; Kollmuss & Agyeman, 2002), this study intends to delve into the ways environmental education (EE) knowledge is disseminated among high school students in Morocco. It is true that Morocco, at very high levels, including the 2011 constitution and the officially proclaimed strategies and plans, demonstrates its readiness and determination to provide a healthy and suitable environment for all the citizens. It is also legitimate to admit that both the state and civil society appear to be engaged in several colossal projects whose main aim is to spread EE, sustainability, and green culture on a large scale. However, we need to acknowledge that the Moroccan educational system has mismatched students' environmental needs and educational goals (Agorram et al., 2009; El Batri et al., 2020; El Batri et al., 2019; El Moussaouy et al., 2014; Riouch & Benamar, 2018). This situation germinates from the fact that EE has not taken sufficient space in the educational system, including curriculum design and planning, teacher training, and instructional material. We contend that both the environmental content and the way it is infused in the curricula prove to be inadequate to keep up with the rising requirements of today's learners to make them more aware, knowledgeable, and concerned about the issues of the environment. In this respect, the general tendency in society seems to reveal that people do not show sufficient concern and positive attitudes toward the environment preservation and sustainability. There is still a prevailing refusal to acknowledge how crucial EE is to environment preservation and to consider school as an influential institution to bring about the desired environmental change.

The problem that this study addresses remains socially, economically, culturally, and educationally persistent because the issue of environmental degradation can be seen as lifethreatening to all species. Therefore, doing research in this area is highly needed to contribute to the ongoing systematic course of actions to preserve the environment and natural resources. Likewise, we acknowledge that school and education can sensitize people, especially the young generation, about environmental issues and prepare them to conveniently treat the environment through instilling ways to promote green lifestyles, pro-environmental attitudes, and environment-friendly behaviors (Hungerford & Volk, 1990). In this context, this study attempts to investigate the status of environmental knowledge amongst Moroccan high school students. It aims to scrutinize the extent to which Moroccan high school students are informed about the most important environmental issues in their country and the world. It also looks at the possible correlations between students' demographic variables and the levels of their environmental knowledge. Therefore,

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this investigation of students' environmental knowledge remains central to our understanding of people's attitudes and behaviors towards the environment.

To achieve these objectives this study attempts to answer the following research questions:

1. To what extent are Moroccan high school students knowledgeable about the basic environmental issues and problems?
2. Are there any correlations between Moroccan high students' environmental knowledge and their age, gender, stream, level, and type of school?

Before embarking on the details of this study, it is noteworthy to provide brief definitions of the most important key terms:

**Environmental Education** was defined by UNESCO and IUCN in 1970 as the process of recognizing values and clarifying concepts to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. EE also entails practice in decision-making and self-formulation of a code of behavior about issues concerning environmental quality (p. 11)

According to the world's first intergovernmental conference on EE, which was organized by the United Nations Education, Scientific, and Cultural Organization (UNESCO) in cooperation with the U.N. Environment Program (UNEP) in Tbilisi in 1977, the essential categories of EE objectives are:

**Awareness:** to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems.

**Knowledge:** to help social groups and individuals gain experience and understanding of the environment and its associated problems.

**Attitudes:** to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.

**Skills:** to help social groups and individuals acquire the skills for identifying and solving environmental problems.

**Participation:** to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward the resolution of environmental problems

**Environmental Knowledge** is the ability to understand the different elements of the environment, which means that all types of knowledge relevant to people's lives and the environment can be included in environmental knowledge. Morris (2016) distinguishes between four different elements of environmental knowledge: *know what*, *know why*, *know-how*, and *know who*. Environmental knowledge is, thus, an essential element in promoting people's EE, enhancing their potential contribution to sustainability, and improving their environment friendly behaviors (Vicente-Molina et al. 2013; Michelsen & Fischer, 2017). In this respect, young learners need to be equipped with sufficient elements of EE, in schools and elsewhere, to enrich their environmental knowledge (Otto & Pensini, 2017). Therefore, investigating high school students' degrees of environmental knowledge may help identify the strong and weak sides of the situation to find solutions to improve it. This study, along with similar ones, can help diagnose and treat some afflictions that affect the environment.

## METHODOLOGY

This study adopted a quantitative research design. The aim was to test to what extent Moroccan high school students are knowledgeable about very important environmental issues in Morocco and the world. Based on convenience sampling, the research sample was constituted of 524 male and female students belonging to eight public and private high schools in Agadir and the suburbs. The study used a questionnaire which targeted all the three levels of high school students: 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grades (the common core, the 1<sup>st</sup> year baccalaureate, and the 2<sup>nd</sup> year baccalaureate). Moreover, the study sample attempted to cover the most important high school majors/streams namely sciences, humanities, technology, and professional baccalaureate. To collect data, an environmental knowledge test was elaborated in a Likert scale questionnaire to collect quantitative data about students' levels of environmental knowledge. The test consists of 19 questions, nine of which target students' conceptual knowledge and ten questions test students' factual knowledge. The conceptual and factual questions were adopted from similar questionnaires developed in other studies (Clarke, 1996; Maloney et al., 1975; Richmond & Morgan, 1977). The 19 items of the knowledge test assessed the respondents' factual and conceptual knowledge of topics covering different aspects of the environment and the questions were designed to touch upon a broad perspective of global and local EE issues. The selected questions took into consideration the nature of knowledge that Moroccan high school students learn formally at school or informally via other media in society. The first 14 items (from item 1 to 14) were in the form of five multiple-choice answers, one of which is 'Not Sure' (sequenced from 'a' to 'e'). The other 5 items (from 15 to 19) included three options: 'True', 'False' or 'Not

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Sure'. Only one answer is correct for each item and is assigned *one* point when chosen by the respondents while the incorrect answers are assigned *zero* point. Thus, the total score is 19 points. To analyze the collected data, descriptive statistics were used to determine the *mean*, *mode*, and *standard deviation* of the respondents' answers on the 19-point score test.

### RESULTS

First, we will present the statistical results of the respondents' answers to the environmental knowledge items in percentages. Then, the total statistics of the whole section is displayed, including the Mean, Mode, and Standard Deviations to gain a comprehensive view regarding Moroccan high school students' level of environmental knowledge.

**Table 1. Students' Answers to Environmental Knowledge Test Items**

1. Do you think most air pollution in our cities comes from?				
a. Cars (8%)	b. Jet aircraft (28,4%)	c. Industrial plants (22,3%)	d. Refuse disposal (26,5%)	e. Not sure (14,7%)
2. Do you think mercury has most often been found at unacceptable levels in?				
a. Fruit and vegetables (29,4%)	<b>b. Seafood (11,5%)</b>	c. Beef (15,6%)	d. Drinks (15,6%)	e. Not sure (25,6%)
3. Which one of the following does not reduce pollution by cars?				
a. Properly tuned engines (14,3%)	<b>b. Super grade petrol (13,9%)</b>	c. Low lead petrol (26,7%)	d. Propane (LPG) engines (22,7%)	e. Not sure (22,3%)
4. Do you think ecology is best described as the study of:				
a. The relationship between humans and the environment (31,7%)	<b>b. The relationship between organisms and the environment (28,6%)</b>	c. The environment (20,8%)	d. Recycling of products (9,4%)	e. Not sure (9,5%)
5. Which one of the following does not decompose in sea water:				
a. Garbage (15,5%)	b. Tin cans (11,6%)	<b>c. Plastic bags (37,2%)</b>	d. Chemical fertilizers (17,9%)	e. Not sure (17,7%)
6. Do you think the Greenhouse Effect is best described as				
a. Excess radiation from the sun causing changes in weather patterns including the El Nino effect (17,4%)	b. The destruction of the ozone layer by CFC's atmosphere by build-up of gases, preventing re-radiation and heat loss (20,8%)	c. Thinning of the ozone layer over the polar regions causing serious diseases including cancers (20,8%)	<b>d. the warming of the Earth's atmosphere by build-up of gases, preventing reradiation and heat loss (23,1%)</b>	e. Not sure. (17,9%)
7. Which one of the following do you think is responsible for the build up most of the lead in our atmosphere?				
<b>a. Cars (10,7%)</b>	b. Aircraft (29,8%)	c. Industrial plants (15,1%)	d. Burning refuse (25,4%)	e. Not sure (19,1%)



8. How long do you think DDT (a long-lasting insecticide) takes to deteriorate into harmless chemicals?				
a. It never does (24%)	b. 10-20 months depending on the weather (29,2%)	<b>c. hundreds of years (13,4%)</b>	d. anywhere from several days to several years (22,5%)	e. not sure (10,9%)
9. The main damage to the ozone layer is caused by:				
a. ultra-violet rays (8,8%)	b. Carbon dioxide (23,3%)	<b>c. chlorofluorocarbons (21,8%)</b>	d. nitrogen oxides (13%)	e. not sure (33,2%)
10. Basic chemical materials would be locked up and would not be available for reuse by plants and animals if it were not for the activities of:				
a. decomposer organisms (27,9%)	<b>b. photosynthetic organisms (8,2%)</b>	c. herbivores (5,3%)	d. carnivores (7,3%)	e. not sure (51,3%)
11. Most of the radiation to which people are exposed is due to:				
a. The normal hazards of work (11,8%)	b. TV sets and watches (24,2%)	c. medical sources (e.g., X-rays) (9,7%)	<b>d. natural sources (29,8%)</b>	e. not sure (24,4%)
12. Most of the oxygen found in the earth's atmosphere is the result of:				
a. The slow decomposition of silica (SiO <sub>2</sub> ) in the earth's crust (19,3%)	b. the action of volcanoes (9,9%)	<b>c. the photosynthetic action of plants (18,1%)</b>	d. the splitting of water molecules (H <sub>2</sub> O) in the oceans (11,1%)	e. not sure (41,6%)
13. Which of the following materials is not biodegradable?				
a. Leaves (5%)	b. bread (4,8%)	c. wood (14,9%)	<b>d. glass (54,4%)</b>	e. not sure (21%)
14. Most of the electrical energy used in Morocco is produced by:				
a. Hydro-power stations (39,7%)	<b>b. coal-burning power stations (4%)</b>	c. oil-burning power stations (33,2%)	d. solar power stations (17%)	e. not sure (6,1%)
15. The interaction of environmental, biological, and social factors determines the size of the human population.				
<b>a. True (23,1%)</b>	b. False (32,4%)	c. Don't know (44,5%)		
16. In any environment, one component like water, air or food may limit the type of life which can survive.				
<b>a. True (40,8%)</b>	b. False (16,8%)	c. Don't know (42,4%)		
17. Living things are interdependent on one another and with their environment.				
<b>a. True (76,3%)</b>	b. False (10,1%)	c. Don't know (13,5%)		



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18. Natural resources are equally distributed with respect to land areas and political boundaries.

- a. True (9,9%)    **b. False (56,1%)**    c. Don't know (34%)

19. Wildlife refuges and undisturbed natural areas may be of value in protecting endangered species and perpetuating endangered species and perpetuating gene pools.

- a. True (48,5%)**    b. False (9,2%)    c. Don't know (42,4%)

Table 1 indicates the percentages which represent the students' answers to each environmental knowledge test item. Within the table, each question is followed by multiple choices which suggest possible answers along with their corresponding percentages. The correct answer is highlighted in **bold** letters to distinguish it from the incorrect alternatives.

As shown in Table 1, only 3 items, namely 13, 17 and 18, were correctly answered in a considerable rate which exceeds 50% of the respondents. Items 5 and 13 are intended to test students' factual knowledge about degradable materials by asking them whether plastic and glass are degradable materials or not. It is noticed that 37,2% and 54,4% of the participants managed to find the correct answer to the two questions respectively. This may indicate that students are to some extent knowledgeable about the type of materials which can decompose in nature albeit in an insufficient manner. Items 16, 17, 18 and 19 receive relatively considerable portions of the respondents' correct answers ranging between 40,8% and 76,3%. These items are mostly concerned with testing students' conceptual environmental knowledge. The questions target issues related to the components of the environment, biodiversity, and the geopolitical distribution of natural resources. The percentages suggest that only moderate numbers of students understand a few concepts about the issues mentioned earlier.

Contrariwise, the percentages of the students who could answer the remaining 13 items correctly are apparently very low. Items 1, 2, 3, 7, 8, 9, 10, 11 and 12 which target assessing students' environmental factual knowledge focus mainly on the different types of pollution (air pollution, soil pollution, water pollution), food contamination, ecosystems and cycles, and the components of the environment. The low percentages of correct responses are suggestive of a mediocre level of students' environmental factual knowledge. Likewise, items 4, 6, 14, and 15 which aim to assess students' environmental conceptual knowledge are concerned with defining ecology and greenhouse effect as well as sources of energy in Morocco and the relationship between environment and human population. The results of these items reveal that most of the students lack adequate knowledge of many basic environmental concepts which high school students are supposed to know.

Building on the percentages of the chosen correct answers throughout the items constituting the test, it is generally noticeable that students were not able to demonstrate a sufficient degree of environmental knowledge both at the factual and conceptual levels. In the same line of thought, other more detailed statistics confirm this conclusion.

**Table 2. Total Results of Students' Answers to Environmental Knowledge Test Items**

Valid	524
Missing	0
Mean	5,7061
Mode	6,00
Std. Deviation	2,70002

As Table 2 demonstrates, the Mode 6 as the most recurrent score among the respondents along with the low Mean 5,706 (much lower than the average score 9,5/19 points) and the relatively high SD = 2,700 obviously demonstrate a low level of students' environmental knowledge and prove that more efforts should be invested to promote Moroccan high school students' factual and conceptual environmental knowledge.

To get a lucid view of the situation of Moroccan high school students' environmental knowledge, Figure 1 serves as a visual illustration of the respondents' test scores. It is quite remarkable that only 47 participants (8,76%) managed to pass this test and gain more than the average (9,5/19 points). However, the great majority of the participants (91,24%) failed to reach the average. In this regard, 477 participants seem to lack adequate elements necessary for answering the questions of the proposed environmental factual and conceptual knowledge test.

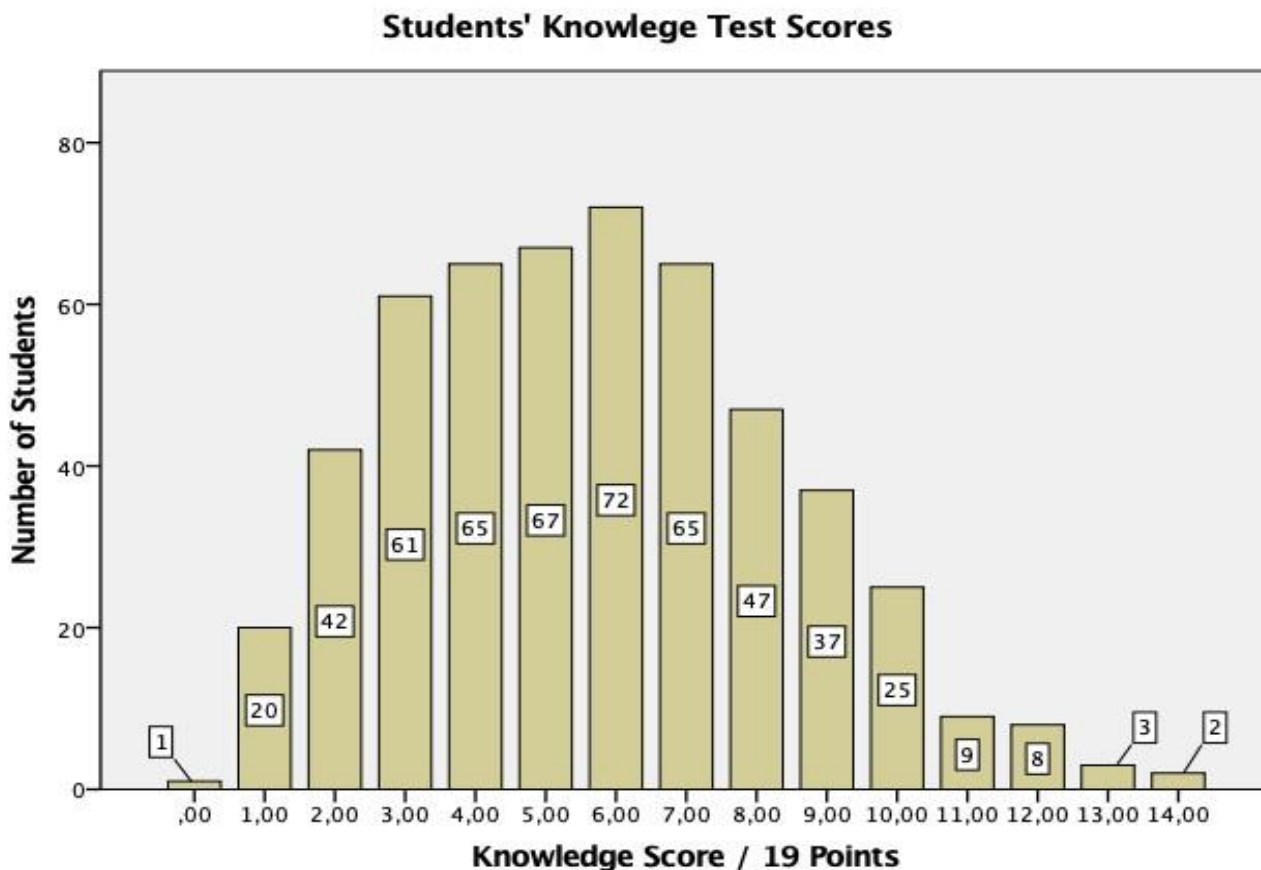


Figure 1. The Distribution of the Respondents According to their EE Knowledge Test Scores

It is evident from the preceding data analysis that Moroccan high school students appear to be deficient in environmental knowledge. Thereafter, students' environmental factual and conceptual knowledge remain below the average since most of the students were unable to answer environmental knowledge test items in a correct way. The upcoming statistics demonstrate the levels of correlations between students' environmental knowledge and their age, gender, stream, level, and type of school.

**Correlations between students' environmental knowledge and their age, gender, stream, level, and type of school.**

As Table 3 demonstrates, there is no significant correlation between the students' environmental knowledge and their stream ( $r = 0.033$ ;  $p \text{ value} = 0.448 > 0.05$ ), age ( $r = 0.017$ ;  $p \text{ value} = 0.702 > 0.05$ ) and gender ( $r = 0.047$ ;  $p \text{ value} = 0.280 > 0.05$ ). Besides, there is a significantly weak correlation between students' environmental knowledge and their school grade ( $r = 0.156$ ;  $p \text{ value} = 0.000 < 0.01$ ) as well as their school type ( $r = 0.202$ ;  $p \text{ value} = 0.000 < 0.01$ ).

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Table 3. Correlations between Students' Environmental Knowledge and their Age, Gender, Stream, Level, and Type of School

		Total mean of students' EE Knowledge	School Grade	Stream	Gender	Age	School Type
Total mean of students' EE attitudes	Pearson Correlation	1	,156**	-,033	-,047	,017	,202**
	Sig. (2- tailed)		,000	,448	,280	,702	,000
	N	524	524	524	524	524	524
School Grade	Pearson Correlation	,156**	1	,282**	,065	,424**	,129**
	Sig. (2- tailed)	,000		,000	,137	,000	,003
	N	524	524	524	524	524	524
Stream	Pearson Correlation	-,033	,282**	1	-,025	,368**	-,484**
	Sig. (2- tailed)	,448	,000		,572	,000	,000
	N	524	524	524	524	524	524
Gender	Pearson Correlation	-,047	,065	-,025	1	,046	,030
	Sig. (2- tailed)	,280	,137	,572		,295	,486
	N	524	524	524	524	524	524
Age	Pearson Correlation	,017	,424**	,368**	,046	1	-,174**
	Sig. (2- tailed)	,702	,000	,000	,295		,000
	N	524	524	524	524	524	524
School Type	Pearson Correlation	,202**	,129**	-,484**	,030	-,174**	1
	Sig. (2- tailed)	,000	,003	,000	,486	,000	
	N	524	524	524	524	524	524

\*\* . Correlation is significant at the 0.01 level (2-tailed).

These results are indicative of the absence of a positive or negative correlation between students' EE knowledge and their age, gender, stream, school type and grade. In other words, the poor level of students' environmental knowledge remains applicable to all their categories of age, gender, stream, school type and grade without any apparent influence of these variables on their EE knowledge.

### DISCUSSION

#### *Students' Environmental Knowledge*

The statistical results of this test revealed a low level of students' environmental knowledge (Mean 5,706 is much lower than the average 9,50 and SD= 2,700 is relatively high). In this respect, nearly half of the participants gave correct answers to the questions

## The Status of Moroccan High School Students' Environmental Knowledge

related to factual knowledge about degradable materials like plastic and glass. Similarly, students showed significant levels of knowledge concerning conceptual information about issues such as the components of the environment, biodiversity, and the geopolitical distribution of natural resources. Overall, the statistics suggested that only moderate numbers of students succeeded in recognizing a few concepts about the environmental issues mentioned earlier. These issues are usually classified as general knowledge that is disseminated via mass media nowadays, and most common people would be familiar with them regardless of their level of education. Thus, the impact of the school curricula and programs on students' environmental knowledge seems to be lacking here.

Conversely, the test scores showed that the levels of Moroccan high school students' factual knowledge about environmental issues like the different types of pollution, food contamination, ecosystems and cycles, and the components of the environment are low to very low. Similarly, the results related to students' environmental conceptual knowledge concerned with the definitions of ecology and greenhouse effect, sources of energy in Morocco, and the relationship between humans and the environment demonstrated an absence of adequate comprehension of many basic concepts. The low scores of the students' environmental knowledge test (91,24% failed to reach the average) are alarming and indicative of the inefficiency of the educational system to teach students basic environmental topics and issues. Environmental knowledge is important in determining the type of EE awareness, attitudes, skill, and participation. The research found a high level of correlation between knowledge and actual commitment (Liere & Dunlap, 1981)

Previous research in environmental knowledge demonstrated that high students' environmental knowledge is limited (Clarke, 1996). The study investigated environmental attitudes and knowledge held by 11<sup>th</sup>-grade students in Queensland in Australia and found that the knowledge scores were judged lower than the available scores at that time. Australian students achieved 50% in the knowledge scores, whereas Moroccan students' scores did not exceed 8,96%, which is suggestive of the huge gap existing between the two countries in terms of students' EE knowledge. In the same way, Kuhlemeier et al. (1999) disclosed that many Dutch "students lacked knowledge regarding environmental topics such as energy usage; soil, air, and water pollution; recycling; agricultural activities; tourism; transportation; and recreation." (p. 10). Another study, which investigated Lebanese secondary school students' environmental knowledge and attitudes (Makki, Abd-El-Khalick, & Boujaoude, 2003), found that students lacked common environmental concepts relevant to their everyday lives. The results in Makki et al.'s (2003) study are consistent with the results in this study. The participants in the two studies scored low in the environmental knowledge test and held moderate levels of pro-environmental attitudes. Students' environmental knowledge test scores were frequently reported low among high school students in different countries regardless of their level of development. In the USA, a survey of high school students' environmental knowledge revealed that the levels of knowledge were disappointing because only one-third of the participants could answer the average of test questions correctly (Gambro & Switzky, 1996). Similarly, Arcury (1990) reported that the participants did not score well in the knowledge test he used in a survey (based on the NEP scale) to measure environmental attitudes and knowledge in Kentucky, USA.

That said, the level of Moroccan high school environmental knowledge resonates with other low levels recorded in numerous studies in different contexts in the world. The statistical results of this thesis indicated a low level of the students' environmental knowledge, but this issue is quite common in other cases with different degrees of course. In this regard, curriculum designers, textbook writers, teachers, and all other educators need to invest extra effort to raise these low levels of environmental knowledge. Raising the level of knowledge could help students adopt more positive environmental attitudes and improve their behavioral actions toward the evergrowing environmental problems and challenges.

### ***Correlations between Students' Environmental Knowledge and their age, gender, stream, school grade, and school type.***

The statistical results indicate that there are no strong positive or negative relationships between the student's low levels of environmental knowledge and their demographic and educational variables (Table 3).

- There is no significant correlation between students' environmental knowledge and their age, gender, and stream
- There is a significant weak correlation between students' environmental knowledge and their school grade and school type

The promotion of students' environmental knowledge is, presumably, essential for raising their positive environmental attitudes and behavior. Students' levels of knowledge are expected to change in accordance with their school grades, streams, and other variables like age and type of school. However, the results of this study indicate that relationships between students' environmental knowledge and their age, gender, stream, school type, and grade are either absent or weak. These levels of correlation suggest that the noticed poor levels of students' knowledge are not related to any of these variables but can be attributed to other external factors, namely the school curricula and other individual and societal factors (Bergman, 2015). Other researchers (Arcury, 1990; Clarke, 1996 & Makki et al., 2003) agreed on the insignificance of the correlation between students' environmental knowledge and their sociodemographic variables. Therefore, it is relevant to underscore the observed research

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result which indicated that both students' environmental attitudes and knowledge are detached from the influence of their age, gender, stream, school grade, and school type.

### CONCLUSION

The scored results of students' environmental knowledge test would contribute to the awakening of the youth's potential abilities and talents to thrive for more sustainable and environmentfriendly lifestyles and mindsets. The observed low levels of environmental knowledge would also trigger more attention to revisit the school curricula for reform and enrichment. Ultimately, researchers and educators are invited to play more prominent roles to grant EE research a proper position in Moroccan academia and the process of education reform. Similarly, designing structured environmental knowledge tests is recommended for future researchers. Such standardized and valid instruments could facilitate the tasks of the researchers and yield reliable results when used in various contexts in Morocco. Teachers are also key factors in instilling EE attitudes and knowledge. Pre-service training and professional development need to address the teachers' EE knowledge and skills to help them plan, perform and assess activities related to the promotion of students' environmental knowledge, awareness, attitudes, skills, and participation. The noticed low levels of students' environmental knowledge and attitudes in this study could be amended by establishing extra-curricular EE programs where different stakeholders may be involved. Such programs are recommended to consider in their planning and execution the global and national plans and strategies of environment protection and improvement. Moroccan high schools can encourage students to participate in innovative projects bearing in mind the state's current policies in clean energies and environment preservation.

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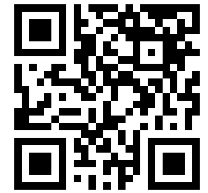
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## The Effect of Information Asymmetry and Debt on Accrual Earnings Management: Firm Size as a Moderating Variable



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**ABSTRACT:** One of the opportunistic manager practices is earnings management. This attitude arises because of the high asymmetry of information between the principal and manager, weak regulation and control. If information asymmetry is high, stakeholders do not have sufficient resources, incentives or access to relevant information to monitor managers' actions. Through the size of the company is expected to see how big the influence of information asymmetry and debt on earnings management actions. This research is included in the third TKT measurement, namely proof-of-concept of important functions and/or characteristics analytically and experimentally. This study aims to examine the impact of the interaction of information asymmetry and debt on earnings management through accrual of working capital with firm size as a moderating variable. This study uses quantitative methods with crosssectional data. This study uses secondary data in the form of financial statements of consumption sector manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2015 to 2021. The results prove that DER has a positive effect on earnings management and company size is able to moderate the effect of DER on earnings management. However, information asymmetry has no effect on earnings management and firm size is not able to moderate the effect of information asymmetry on earnings management.

**KEYWORDS:** Information asymmetry, earnings management, leverage, firm size.

### INTRODUCTION

Every company has a contract with management in which a manager has responsibilities to society and shareholders. Usually the form of accountability is in the form of financial statements. Financial statements describe the company's financial condition, company performance, changes in financial position, and so on. The management provides information on the financial statements which will be assessed and evaluated for their performance (Chen et al, 2005). Judging from its historical development, financial statements have undergone a change in function, namely from the initial function which was only as a form of accountability for managers to capital owners to several functions that are more focused on future interests. However, in reality, not all financial statements are able to describe the actual economic conditions and are not transparent (W. Utami, 2006). Management knows more about the company's economic conditions than investors and management behavior is not always beneficial for capital owners (Jensen & Meckling, 1976).

Jensen & Meckling (1976) reinforce one of the opportunistic managers' practices is to conduct earnings management. This opportunistic attitude arises because of the relatively high information asymmetry between the principal (owner) and manager, weak regulation and control. If information asymmetry is high, stakeholders do not have sufficient resources, incentives or access to relevant information to monitor managers' actions.

(Pernamasari & Sugiyanto, 2022) said the existence of information asymmetry will encourage management to present financial statements that do not reflect actual conditions, especially if this is used as a basis for measuring performance. (Setiany & Wulandari, 2015) in their research proves that investors as principals use financial information. Information asymmetry problems potentially experienced by investors can be overcome with better quality financial information so that investors can make appropriate investment decisions. Investors themselves have various considerations to decide on a stock investment in the capital market. Ardian & Khoiruddin (2014) added that stock price fluctuations are erratic and contain the risk of causing investor uncertainty in determining their investment decisions, such as the company's financial condition contained in the annual report. So to assist investors in making investment decisions, companies need to carry out financial reporting by manipulating earnings.

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Wang & Wang (2017) analyze the effect of asymmetric information trading, namely how stock prices move after investors obtain information about events that occur. The result is that the price-sensitive trader or information seeker gains an advantage in analyzing the stock market in the presence of information asymmetry so that the data reduces losses. However (Ghazali et al, 2015) added that if the earnings information is used by managers to convey superior and useful information they know about the company's performance to shareholders and debt holders, then earnings management may not be harmful to shareholders and the public.

As revealed (Rahimipour, 2017) a relationship can be found between accounting items and managers who have the ability to manipulate them such as discretionary accruals and stock returns. Managers of developing companies have more incentives and motivation for signaling confidential information about the company's future performance through discretionary accruals. As a result, investors will recognize incentives and motivations and will be rewarded for this information reflected on financial statements.

According to Utami (2005) to detect the presence or absence of earnings management, the measurement of accruals is very important to note. Total accruals are the difference between profit and cash flows from operating activities. Total accruals are divided into two parts, namely: (1) the accrual part which is naturally present in the process of preparing financial statements is called normal accruals or non-discretionary accruals, and (2) the accrual part which is manipulation of accounting data is called abnormal accruals or discretionary accruals.

Pradita & Haryanto (2017) examined the relationship of information asymmetry between budget participation and budgetary slack. The result is that asymmetric information is considered capable of mediating the relationship between budget participation and budgetary slack. Information asymmetry occurs when subordinates have more relevant information in the decision-making process related to budgeting, which the superior does not have. Likewise with the results of research (Wijayanto et al, 2007) where there is a significant positive relationship between information asymmetry and earnings management, the higher the information asymmetry, the higher the earnings management so that the existence of earnings management will have an effect on the financial statements used. Likewise with the relationship between debt and earnings management, companies whose assets are financed by debt tend to take action to increase the amount of profit earned due to high interest expenses. The consequence of using leverage according to (Cai & Zhang, 2011) is that if from the use of debt it turns out that the rate of return on assets (return) is greater than the cost of debt, the leverage is profitable and the return on capital using this leverage also increases, on the contrary if the return on assets is less than the cost of debt, then leverage will reduce the rate of return on capital. The results of the study (Y. P. Agustia & Suryani, 2018) managed to obtain evidence that leverage has an effect on earnings management actions.

The relationship between company size and information asymmetry and earnings management is that large companies have a high enough initiative to practice earnings management, because one of the driving factors is that large companies must be able to meet the expectations of shareholders. Likewise, companies whose assets are financed by debt tend to take action to increase the amount of profit earned due to the high interest expense (Mustikawati & Cahyonowati, 2015; Sutapa & Suputra, 2016).

### **LITERATURE REVIEW**

#### **Agency theory**

Agency theory states that there is an agency relationship as a contract between management as an agent with ownership as a principal of the company, a working relationship between the party that gives the authority (principal), namely the shareholder and the party receiving the authority (agent) of the company in the form of cooperation, called the principal nexus of contract providing authority and authority to agents to run the company in the interests of owners and principals, (Jensen & Meckling, 1976). Agents have more information about their capacity, work environment and the company as a whole. This is what results in an information imbalance between the principal and the agent, which is called information asymmetry. This information asymmetry and conflict of interest encourage agents to present untrue information to the principal, especially if the information relates to the agent's performance.

#### **Earning management**

Copeland, 1968 in (Utami, 2005) defines earnings management as "same ability to increase or decrease reported net income at will", this means that earnings management includes management's efforts to maximize or minimize profits including profit equipment in accordance with management wishes. Earnings management is carried out to influence investors' perceptions, especially to influence the decision to buy company shares.

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Zang (2012) said that accrual earnings management tends to be carried out by managers after the fiscal year ends. Some managers may find it very expensive because their company faces intense competition in the industry. Within an industry, companies tend to face varying degrees of competition and, therefore, come under different amounts of pressure when deviating from an optimal business strategy.

In this study, the proxy for earnings management used is the actual specific model, namely the accrual of working capital. The use of working capital accruals is more appropriate as has been studied by (Utami, 2005). Because discretionary accruals are considered more complicated, a proxy for the ratio of working capital accruals to sales is used. The reason is because earnings management mostly occurs in sales accounts. Working capital accrual data can be obtained directly from the operating activity cash flow statement, so that investors can directly obtain the data without performing complex calculations.

### **Information Asymmetry**

The perspective of information asymmetry implies that managers try to reduce information asymmetry in order to maximize the value of the company in an opportunistic way. Imbalance of information from both owners and managers of the company can lead to information asymmetry, which in accordance with agency theory, the existence of information asymmetry can provide benefits for managers in maximizing their personal benefits. (W. Utami, 2005) revealed that the higher the information asymmetry, the greater the bid-ask spread, in this case the disclosure of financial statements is expected to reduce information asymmetry so that the bid-ask spread also decreases.

When information asymmetry arises, disclosure decisions made by managers can affect stock prices because information asymmetry between more informed investors and less informed investors raises transaction costs and reduces the expected liquidity in the market for company shares (Komalasari, 2000). Nuryatno et al, 2019).

### **Debt**

Debt policy can be represented through leverage ratios. The leverage ratio describes the source of operating funds used by the company. The leverage ratio also shows the risks faced by the company. The greater the risk faced by the company, the uncertainty to generate future profits will also increase (D. Agustia, 2013). The consequence of using leverage according to (Cai & Zhang, 2011) is that if from the use of debt it turns out that the rate of return on assets (return) is greater than the cost of debt, the leverage is profitable and the return on capital using this leverage also increases, on the contrary if the return on on assets is less than the cost of debt, then leverage will reduce the rate of return on capital.

### **Company Size**

Company size is the scale of the company seen from the total assets of the company at the end of the year. However, total sales can also be used to measure the size of the company. Companies with large sizes have greater and wider access to sources of funding from outside, so that obtaining loans will be easier because it is said that companies with large sizes have a greater chance of winning the competition between surviving in the industry (Nariastiti & Ratnadi, 2014).

### **Method analysis and model design**

The population of this research is the consumption sub-sector manufacturing companies on the Indonesia Stock Exchange, with the observation year 2015-2021. Sampling in this study used a purposive sampling technique, where purposive sampling is a sampling technique of data sources with certain considerations. The number of manufacturing companies listed on the IDX until 2021 is 140 companies.

### **Dependent Variable**

The dependent variable or the dependent variable is the variable that is influenced or which is the result of the independent variable (Sugiyono, 2013). The dependent variable used in this study is earnings management. Earnings Management, proxied based on the ratio of working capital accruals to sales (W. Utami, 2005). In this study, the proxy for earnings management used is the actual specific model, namely the accrual of working capital. The use of working capital accruals is more appropriate as has been studied by (Utami, 2005). Because discretionary accruals are considered more complicated, a proxy for the ratio of working capital accruals to sales is used. The reason is because earnings management mostly occurs in sales accounts. Working capital accruals data can be obtained directly from the operating activity cash flow statement, so that investors can directly obtain the data without performing complex calculations.

Earnings management (EM) = Working capital accruals (t) / Sales period (t) Accrual of working capital =  $\Delta AL -$

$\Delta HL - \Delta Cash$  Information:

$\Delta AL$  = Change in current assets in period t

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$\Delta HL$  = Change in current liabilities in period t

$\Delta Cash$  = Change in cash and cash equivalents in period t

Working capital accruals data can be obtained directly from the operating activity cash flow statement, so that investors can directly obtain the data without performing complex calculations.

### Independent Variable

Independent variables or independent variables are variables that affect or are the cause of changes or the emergence of the dependent variable (the dependent variable) (Sugiyono, 2013). The independent variables used in this study are information asymmetry and debt.

- a. Information asymmetry ( $A_i$ ). Information asymmetry in this study was measured using the relative bid ask spread. (Rahmawati & Handayani, 2017) calculates the relative bid-ask spread as follows:

$$SPREAD_{it} = (\text{askit} - \text{bidit}) / ((\text{askit} + \text{bidit})/2) \times 100$$

Note:  $SPREAD_{it}$  = Relative bid-ask spread of company i on day t

$ASK_{it}$  = The highest ask (bargain) price of company i's shares on day t

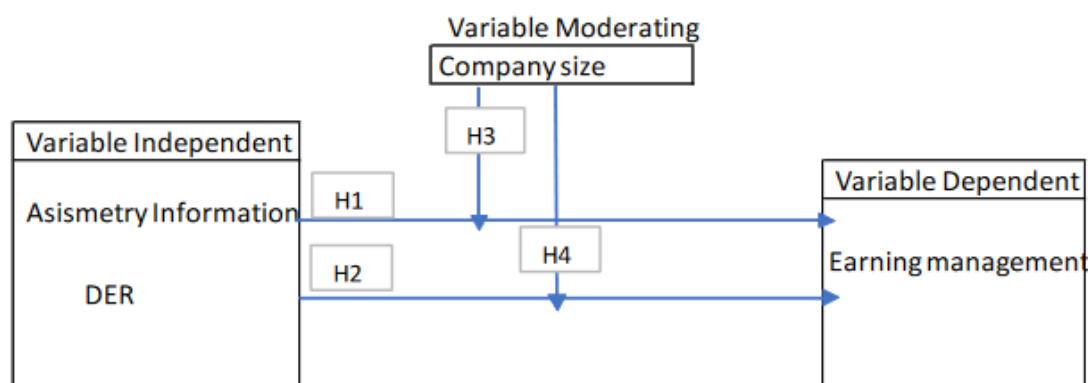
$BID_{it}$  = The lowest bid (ask) price for company i shares on day t

- b. Debt. In this study is to use the variable Leverage. A low leverage ratio indicates that the company has a good financial position because the company is able to cover all of its short and long term debts when the company is liquidated. In this study, the leverage ratio (LEV) is calculated by comparing total liabilities with total equity.  $DER = \text{Total liabilities} / \text{total equity}$

### Moderating Variables

The moderating variable in this study is the firm size variable. In this study, the size of the company here uses total assets, namely:

$$\text{Size} = \ln(\text{Total assets})$$



To test the framework above, using SPSS.22 analysis tool to test the feasibility of the model, F test and t test. There are several ways to test regression with moderating variables and one of them is Moderated Regression Analysis (MRA). Moderated Regression Analysis (MRA) or interaction test is a special application of linear multiple regression where the regression equation contains interaction elements (multiplication of two or more independent variables), (Lie, 2009). The multiple linear regression equation in this study is as follows:

$$EM = \alpha + \beta_1 A_i + \beta_2 DER + \beta_3 A_i * \text{size} + \beta_4 DER * \text{size} + \epsilon$$

Information:

EM: Earning Management

$A_i$ : Asimetry Information

DER: Debt to equity ratio

Size: Company Asset

# The Effect of Information Asymmetry and Debt on Accrual Earnings Management: Firm Size as a Moderating Variable

## RESULT AND DISCUSSION

**Descriptive Test Results Table 1 Descriptive Test Results Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
asimetriinformasi	154	1.2371	116.7260	20.868458	15.3420699
leverage ukuran perusahaan	154	1.0000	382.4800	65.639430	66.6261416
manajemen laba	154	6.1999	26.7131	14.343118	3.1542065
Valid N (listwise)	154	-5.0131	13.1140	.052559	1.1791646

In table 1 the results of the descriptive test can be described as follows:

1. Information asymmetry. Information asymmetry in consumption industry companies obtained a minimum value of 1.23 belonging to Pt Darya-Varia Laboratoria Tbk in 2020 and a maximum value of 116.72 belonging to Pt Merk Tbk in 2020. On average the value of information asymmetry in companies in this sector is 20.86, where the higher the information asymmetry, the greater the bid-ask spread, in this case the disclosure of financial statements is expected to reduce information asymmetry so that the bid-ask spread also decreases.
2. Leverage. In this study, the measurement of leverage using the DER proxy is how much the company's capital is financed by debt or how much the company's debt affects its capital management. In the table above, the minimum DER value of 1 belongs to Pt HM Sampoerna Tbk in 2020 and 2021, while the maximum DER value of 382.4 belongs to PT. Pyridam Farma Tbk in 2021. On average, the DER value for consumption sector companies is 65.63, which means that from 100 percent of the capital/equity owned by the company, on average, 65.63 percent is financed by debt.
3. Company size. In this study, the measurement of company size uses the total asset value. The minimum asset value of 6.19 or 492 billion belongs to PT Chitose Internasional Tbk in 2021. While the maximum asset value of 26.71 or 3.9 trillion belongs to PT Chitose Internasional Tbk in 2016.
4. Earnings management. In this study, the measurement of earnings management uses accrual of working capital. Earnings management is an attempt by company managers to intervene or influence the information in the financial statements. The earnings management proxy used in this study is the actual specific model, namely the accrual of working capital. In the table above, the minimum value of -5.01 belongs to Pt Unilever Tbk and the maximum value of 13.11 belongs to Pt Unilever Tbk. On average, manufacturing companies in the consumption sector have a value of 0.05, this means that the management has 0.9% in influencing the company's operations. The smaller the accrual value, the smaller the management action in influencing the company's operations.

### Normality test result

In this study, the One-Sample Kolmogorov-Smirnov Test was used to test for normality.

**Table 2. Normality Test Results**

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		140
Normal Parameters <sup>a,b</sup>	Mean	.0000000
	Std. Deviation	1.40882244
Most Extreme Differences	Absolute	.081
	Positive	.081
	Negative	-.071
Test Statistic		.081
Asymp. Sig. (2-tailed)		.191 <sup>c</sup>

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

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Based on the results of the normality test above, the Sig (2-tailed) value through the OneSample Kolmogorov-Smirnov Test was obtained, which was 0.068 or > 0.05. So it can be said that these data are normal and can be continued to the next test.

### Model Fit Test

**Table 3. Model Conformity Test Results**

Model	Coefficients <sup>a</sup>				
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-.696	.344		-2.024	.045
Asimetry information	.248	.092	.538	2.677	.008
DER	.005	.050	.016	.106	.916
Size	.022	.011	.220	2.005	.047
Moderating 1	-.001	.000	-.753	-3.777	.000
Moderating 2	1.525E-5	.000	.032	.206	.837

a. Dependent Variable: Earning Management

Uji F = 0.005

R Square = 0.117

DW = 1.950

Source: spss data processing

Based on table 3 the results of the model suitability test, the regression function can be made as follows:

$$\text{MnjProfit} = -0.696 + 0.248\text{Ai} + 0.005\text{DER} + 0.022\text{Size} - 0.001\text{Ai}*\text{size} + 1.52\text{DER}*\text{size}$$

If there are no factors that influence earnings management in consumption sector companies in Indonesia during the year of observation, it is -0.696 or <1. If there is a 1% increase in the information asymmetry variable, it will increase the earnings management value by 0.248. If there is an increase of 1% of the DER variable, it will increase the value of earnings management by 0.005. If there is an increase of 1% of the company size variable, it will increase the value of earnings management by 0.022. If there is an increase of 1% of the moderating variable between size and information asymmetry, it will reduce the value of earnings management by 0.001. If there is an increase of 1% of the moderating variable between size and DER, it will increase the value of earnings management by 1.52.

If look at table 3, it can be seen that the F test value is below 0.05, so it can be said that this model is fit, simultaneously all independent variables have an influence on the dependent variable. If look at the Rsquare value of 0.117, it can be said that the independent variable is able to influence 11.7% on the dependent variable and the remaining 88.3% is influenced by other variables outside this study.

If look at the t-test by paying attention to the significant coefficient values in table 3, it can be said that the information asymmetry variable has no effect on earnings management, while DER and firm size have a positive effect on earnings management. The moderating variable between firm size and information asymmetry has no effect on earnings management, so it is also called a Potential Moderating Variable or this variable does not interact with the predictor variable and does not have a significant relationship with the dependent variable. While the moderating between company size and DER has an effect on earnings management, including the type of quasi-moderation (pseudomoderation). Quasi moderation is a variable that moderates the relationship between the predictor variable and the dependent variable where the pseudo moderating variable interacts with the predictor variable as well as the predictor variable.

## DISCUSSION

### a. The effect of information asymmetry on earnings management.

In the results of table 3 it can be said that information asymmetry has no effect on earnings management. It can be said that information asymmetry is not a factor that is highly considered in earnings management actions carried out by the company's management. This is because in addition to good company growth, there is also the possibility of errors in previous financial reporting that are not in accordance with qualitative rules. This result is in line with the results (Barus & Setiawati,



## **The Effect of Information Asymmetry and Debt on Accrual Earnings Management: Firm Size as a Moderating Variable**

2015; Patriandari & Fitriana, 2019) saying that information asymmetry has no effect on earnings management because it is possible that the market does not react to earnings announcements made by companies that carry out earnings management, because the earnings information reflects earnings management. the company's performance is estimated to be bad and the company is rated negatively.

### **b. Effect of DER on earnings management**

Table 3 shows that DER has a positive effect on earnings management. This means that the higher the debt, the higher the accrual value, which can be said to carry out earnings management actions. Companies that have a high DER ratio, company managers tend to use accounting methods that can increase revenues or profits. Companies with high DER ratios will also have difficulty in obtaining additional funds from creditors and even companies are threatened with violating debt agreements. So that management tends to carry out earnings management, to gain trust so that investors and creditors want to invest their funds or lend funds to companies. Agency theory (Jensen & Meckling, 1976) says agents have more information about self-capacity, work environment and the company as a whole, this is what can make management take earnings management actions. This result is in line with (Y. P. Agustia & Suryani, 2018) successfully obtaining evidence that leverage has an effect on earnings management actions.

### **c. Firm size in moderating the effect of information asymmetry on earnings management**

Table 3 shows that firm size has a positive effect on earnings management, but is unable to moderate the effect of information asymmetry on earnings management. It can be said that companies that have larger assets have a broader and more complex structure of stakeholders in their management. However, even though the company has large assets, information asymmetry is not a factor that is highly considered by management in earnings management actions. Management will be much more careful in managing the company and conveying this information in the financial statements. Financial statements still produce the same information when tested again using the same method. This result is not in line with research (Mustikawati & Cahyonowati, 2015) which says that large companies will cause information asymmetry gaps, which lead to earnings management actions.

### **d. Firm size in moderating the effect of DER on earnings management**

Table 3 shows that firm size has a positive effect on earnings management, and firm size is also able to moderate the effect of DER on earnings management. The moderating relationship is pseudo moderation (Quasi Moderator), where the predictor and dependent variables interact with each other. It can be said that companies that have large assets tend to have their capital/equity come from debt. Companies that have more assets/capital financed by debt tend to take action to increase the amount of profit. This increase in the amount of profit can be manipulated by management with earnings management actions. This result is in accordance with (Sutapa & Suputra, 2016) where large companies have a high enough initiative to practice earnings management, because one of the driving factors is that large companies must be able to meet the expectations of shareholders.

## **CONCLUSION**

This research can be drawn a conclusion, namely:

1. Information asymmetry has no effect on earnings management. It can be said that information asymmetry is not a factor that is highly considered in earnings management actions carried out by the company's management.
2. DER has a positive effect on earnings management. It can be said that the higher the company's debt, the higher the accrual value which can be said to carry out earnings management actions.
3. Firm size is not able to moderate the effect of information asymmetry on earnings management. It can be said that companies that have larger assets have a broader and more complex structure of stakeholders in their management.
4. Firm size is able to moderate the effect of DER on earnings management. It can be said that companies that have large assets tend to have their capital/equity come from debt. Companies that have more assets/capital financed by debt tend to take action to increase the amount of profit.

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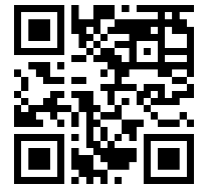
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## Quality of Public Service One-Stop Administration System Southeast Sulawesi Province



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**ABSTRACT:** Government organizations have a strategic position in providing quality public services. The quality of public services plays a central role in the happiness of citizens, sustainability, and growth of communities, regions, and nations. Public service is the essence of a democratic system that reflects the quality of a democratic system theoretically and strives as much as possible to provide quality public services. This study aims to analyze the quality of public services for the One-Stop Administration of the Southeast Sulawesi Province, which lasted for three months, from October to December 2021. The population of this study was all civil servants at the Office of the One-Roof Administration of Southeast Sulawesi Province totaling 125 people. The research sample was 56 people using a questionnaire which was then analyzed descriptively. The results of the study show that the quality of public services is in the "good" category, meaning that employees provide services to the community with easy access, speed of provision, responsiveness, service communication, and cost-effectiveness.

**KEYWORDS:** Public Service, Administration, Southeast Sulawesi.

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### I. INTRODUCTION

The provision of quality public services plays a central role in the sustainable happiness of citizens. In addition, public services are the essence of a democratic system that reflects the quality of a democratic system. Theoretically, nothing is more important for the government than trying as much as possible to provide quality public services. The idea shows that the government should adopt and implement quality public service policies to increase the happiness of citizens and strengthen democracy. The ideal idea of public service is that officials who occupy positions of public authority place the interests of the entire community in the direction of the entire public decision process and put aside their personal or group interests when making public decisions.

Public services flow from civil virtues in the form of shared values and the collective interests of citizens. The whole process and content of public services should be based on awareness to realize collective virtues in society. The provision of quality services is not easy, especially in a diverse society, even though the government has formulated and adopted public service policies that are considered representative of the majority of the interests of the community, and has even allocated a decent amount of budget, but the implementation is often not as easy as imagined. Even in developing countries, officials are still more dominant than the provision of services desired by citizens.

Currently, many government leaders in developing countries can only provide lip service to the demands of citizens regarding their vital needs and do not make any improvements to achieve quality public services. This condition is largely sourced from internal government factors which continue to be the basis of demands for public service reform in developing countries. Poor public service in developing countries is characterized by personal or partisan nature, convolutedness, informal charging of fees, and complicated filing requirements.

The government organization that carries out the public service mandate is the One-Stop Administrative System Office which is a technical implementing unit for the Regional Revenue Agency of Southeast Sulawesi Province which optimizes receipts for Motor Vehicle Taxes, Transfer Fees for Motor Vehicles, and other types of revenues through intensification, extensification, and raids. Vehicle. This background is a reference in determining the quality of public services. This research is very important because the One-Stop Administration System of Southeast Sulawesi Province as a public institution is obliged to provide quality public services.

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### II. THEORETICAL REVIEW

Government organizations are large organizations that serve and accommodate all levels of society with applicable laws and regulations. Therefore, government organizations must have reliable and productive human resources by trying to improve the performance of employees (Kusumastuti, 2019;Paré & Maloumby-Baka, 2015). Performance is the result of work that can be achieved by employees or groups of employees in an organization, by their respective authorities and responsibilities to achieve organizational goals (Janenova & Kim, 2016;Fredriksson, 2020). Good performance is influenced by two things, namely management information systems and good public services (Afifudin et al. 2020;Yu et al. 2022).

Organizational performance is often not optimal due to several reasons, namely, lack of support for qualified human resources, promotion of inappropriate positions, not looking at the level or level of employee education, and work experience, so that employees are motivated to improve their performance, but instead, work worries and tends to leave work (Andayani & Pujiyanti, 2020). Employees who have the ability and professional attitude at work are very likely to be able to achieve the expected work results and the higher the employee's work performance, the higher the work performance (Pramularso, 2020).

The larger an organization, the more data that must be processed and the wider the information network to be managed. Data processing has become an important part of the Management Information System which will affect every activity of the organization (Kurniawan & Prabawati, 2021). The data that is processed into information will be used in making decisions, supporting routine tasks, evaluations, and the need to compete. Every organization today needs knowledgeable employees (Linelejan, 2021). Employees who have good knowledge in their fields will facilitate the achievement of organizational goals. For that, it takes a strong spirit and desire from within oneself to improve the quality of oneself to produce good performance results (Maysara & Asari, 2021).

The government as a public servant continues to strive to create positive perceptions by continuously increasing community satisfaction related to the various services that can be provided (Putra et al. 2021). Community satisfaction is strived to continue to increase by providing the best quality service and continuing to encourage employee performance to be more optimal in carrying out their duties (Soselissa & Puturuhu, 2021). The satisfaction felt by the community is one of the performance measures that can be used by government agencies in carrying out their duties and obligations (Amir & Hikma, 2022). Various public perceptions will emerge automatically after the community interacts directly in fulfilling various interests related to government agencies. Facing this, government agencies as public servants of course try hard so that the perceptions that arise are positive or can provide satisfaction to the community (Hasbudin et al. 2022).

Existing services should be by several general service principles, namely, simplicity where service procedures are uncomplicated, easy to understand, and easy to implement, as well as other principles, namely timeliness, and accuracy, which means according to a predetermined service time, and the results of the service true and correct (Hikmah, 2022;Juanda et al. 2022;Muslim, 2022). An overview of the satisfaction received by the community in government agencies including the quality of services provided (Siregar, 2022). Quality that is managed properly can make a positive contribution to the realization of customer satisfaction and loyalty (Suhaeman et al. 2022;Sulaeman et al. 2022). In this case, the quality of service provided is in the form of optimal fulfillment of community needs by existing standards and procedures provided by the government and of course for employees as well as part of carrying out tasks whose work implementation is based on applicable regulations and policies (Phusavat & Anussornnitarn, 2009;Styrin & Zhulin, 2011;Kohlborn et al. 2013).

Community satisfaction can also be influenced by the performance of the relevant employees. Employee performance is a benchmark for what has been done as an executor in government agency activities. Employees who have a good understanding of their duties and are responsive to meeting the needs of the community are certainly very supportive of the success of their agencies in providing services to the community. Performance is a result of a job where there is a strong relationship where one of them is customer satisfaction, in addition to performance it also has strategic organizational goals and contributes to the economy. Efforts made by the government in increasing community satisfaction include providing convenience services in the form of One-Stop Integrated Services.

### III. RESEARCH METHODS

This research is located at the Office of the One-Roof Administrative System of Southeast Sulawesi Province, which is the technical implementation unit of the Regional Revenue Agency of Southeast Sulawesi Province. The reason for choosing the location is because of the gap in the quality of public services which is thought to occur due to the lack of work motivation factors for employees at that location. The research was carried out for three months, from October to December 2021. The population of this study was all civil servants at the One Roof Administration System Office of Southeast Sulawesi Province totaling 125 people with a research sample of 56 people using questionnaires.



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This study uses a quantitative approach where this research departs from theories that are translated into hypotheses that can be tested based on data collected from the field and then formulate generalizations on the conclusions of the findings in the research population. The research strategy applied is an explanatory survey in which the researcher uses empirical data on the motivation and quality of public services based on data from research respondents collected using a questionnaire. The questionnaire was closed using a Likert scale with five levels, as follows: Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. The research instrument (questionnaire) is first tested for validity to ensure the acquisition of accurate and reliable data. The data obtained are processed and analyzed to produce information that supports concluding. The first stage is data selection to ensure consistency. In the second stage, the data that has been selected is tabulated and then recorded in the form of a table according to the analysis format, then the descriptive analysis is carried out.

### IV. RESULTS AND DISCUSSION

This research model includes the quality of public services as the dependent variable which is predicted to be influenced by the work motivation of the employees of the One-Stop One-Stop Administration System of the Regional Revenue Agency of Southeast Sulawesi Province. The quality of public services in this research model is the privilege of service processes and products provided by public service employees/officers as measured by ease of access, speed of provision, responsiveness to customer needs, service communication, and cost-effectiveness, where the dimensions of service quality are broken down into seven items. Tabulation of respondents' answer scores based on the results of processed questionnaires and statistical calculations of the average score of the variable quality of public services are presented in Table 1.

**Table 1. Quality of Public Service Administration System One-Stop Regional Revenue Agency of Southeast Sulawesi Province**

Items	Total Score	Actual	N	Average Score	Actual	Ideal Score	% Actual Score to Ideal Score	Category
1	245		56	4,38		5	87,50%	Very good
2	188		56	3,36		5	67,14%	Medium
3	187		56	3,34		5	66,79%	Medium
4	190		56	3,39		5	67,86%	Medium
5	230		56	4,11		5	82,14%	Good
6	214		56	3,82		5	76,43%	Good
7	204		56	3,64		5	72,86%	Good
<b>Total</b>	<b>1458</b>		<b>392</b>	<b>3,72</b>		<b>5</b>	<b>74,39%</b>	<b>Good</b>

Source: Primary Data Analysis, 2021

Table 1 above shows that there are 7 items of public service quality analyzed, this is by the questionnaire design. Respondents' answer scores for each item of public service quality and their categorization are as follows:

1. The service counter clerk is easy to find during service working hours. The average score of the measurement results is 4.38 or 87.50% of the ideal score, in this case, the ideal score is 5 which can be achieved if all respondents answered strongly agree. With this score, Item 1 is classified as "very good". Being classified as very good means that employees are generally on standby at their respective places of duty so that they are easily found by residents who want service. However, the score achieved for this item has not been maximized because there are employees who are sometimes on duty outside the office so residents have to wait.
2. Officers start service on time. The average score of the measurement results is 3.36 or 67.14% of the ideal score, in this case, the ideal score is 5 which can be achieved if all respondents answered strongly agree. With this score, Item 2 is classified as "medium". Classified as moderate means that employees starting services are sometimes later than the specified working hours. Some employees are still preparing or fixing the files even though there are residents who are already waiting.
3. Officers can complete the stages of service within the specified time limit. The average score of the measurement results is 3.34 or 66.79% of the ideal score, in this case, the ideal score is 5 which can be achieved if all respondents answered strongly agree. With this score, Item 3 is classified as "medium". Classified as moderate means that employees are often unable to complete the stages of service within the specified time limit. For example, STNK service promises to be completed within 3 hours are mostly not kept or are not completed on time, so residents have to wait longer than the target.
4. Officers are responsive to customer/community needs. The average score of the measurement results is 3.39 or 67.86% of the ideal score, in this case, the ideal score is 5 which can be achieved if all respondents answered strongly agree. With this score, Item 4 is classified as "medium". Being classified as moderate means that the respondent's employees admit that in general,



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they have not been sufficiently responsive to the needs of the community/customers who are dealing. The author sees that sometimes there are residents who look confused when they arrive at the service waiting room but the officers are not responsive to meet and ask what they need. Likewise, the author does not see any supporting facilities such as newspapers and drinking water dispensers in the waiting room.

5. Officers provide clear information about the service process. The average score of the measurement results is 4.11 or 82.14% of the ideal score, in this case, the ideal score is 5 which can be achieved if all respondents answered strongly agree. With this score, Item 5 is classified as "good". Classified as good means that service information is presented clearly by each employee in their respective fields of duty. The author sees that sometimes certain counter officers provide explanations about the location of other counters or the presence of other counter officers who are about to be met by residents who deal with them.
6. Officers provide consistent information about the service process. The average score of the measurement results is 3.82 or 76.43% of the ideal score, in this case, the ideal score is 5 which can be achieved if all respondents answered strongly agree. With this score, Item 6 is classified as "good". Classified as good means that employees in providing information to residents who deal always maintain consistency of information, for example, do not differentiate the information provided according to the status of citizens, or do not give different explanations to different people for the same substance.
7. Officers do not charge service fees other than those stipulated in law/regulations. The average score of the measurement results is 3.64 or 72.86% of the ideal score, in this case, the ideal score is 5 which can be achieved if all respondents answered strongly agree. With this score, Item 7 is classified as "good". Classified as good means that the employee on duty does not charge service fees beyond what is stipulated in the law/regulations. Respondents in writing see that all cost components in managing the One-Stop Manunggal Administration System have been stated in writing and informed to residents. However, sometimes there is an additional cost component that is charged to residents for complementary affairs. For example, for matters of friction with the engine number and vehicle frame number, residents bear additional costs but they are not binding to make it easier for those who want to take advantage.

The score of each item as described above, for the 7 items of public service quality, the score obtained from 56 research respondents in total is 1458 or an average of 3.72 where the percentage of the actual score to the ideal score is 74.39% so that the category of service quality level public, in general, is classified as good. The quality of public services is classified as good, meaning that the employees of the One-Stop Administration of the Regional Revenue Agency of Southeast Sulawesi Province have been able to demonstrate the privileges of processes and service products to citizens/customers as measured by ease of access, speed of provision, responsiveness to customer needs, service communication, and effectiveness. cost. Public service officers of the One-Stop Administration of the Regional Revenue Agency of Southeast Sulawesi Province have realized virtues in serving the interests of the community which are observed from the parameters of ease of access, speed of provision, responsiveness to customer needs, service communication, and cost-effectiveness

## V. CONCLUSIONS

The quality of public services for the One-Stop Administration of the Regional Revenue Agency of Southeast Sulawesi Province is in the "good" category. The quality of public services in the good category means that employees providing services to the public have been able to demonstrate the privileges of processes and service products to citizens/customers as measured by ease of access, speed of provision, responsiveness to customer needs, service communication, and cost-effectiveness. However, the score for the quality of public services is also not maximized as expected in the public service literature in general and what is expected by the people of Southeast Sulawesi in particular.

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# Towards an Implicit Model of Curriculum-Embedded Ideological and Political Education for Foreign Language Majors in Chinese Universities: Taking Ecological Civilization Education as an Example



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**ABSTRACT:** Taking “ecological civilization” education as an example, this paper explores an effective model of curriculum-embedded ideological and political education of foreign language majors in Chinese colleges and universities based on the concept of ecological interactive context and ecolinguistic continuum. This paper comprehensively discusses the effectiveness of core values content processing methods for foreign language courses in different contexts from three aspects: “the synergy between ecological civilization education and ecological values”, “the synergy between ecological civilization education and ecological behavior”, and “the synergy between teacher niche and student niche”. Considering the current problems of the curriculum-embedded ideological and political education such as the formalization and the disciplinization of the course content, the influence of explicit and implicit processing of foreign language majors on core values education is investigated to provide a basis for the formulation of relevant policies and theoretical research in colleges and universities.

**KEYWORDS:** ecological interactive context; curriculum-embedded ideological and political education; foreign language teaching; synergy; explicit/implicit learning.

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## 1. THE INTRODUCTION

With the rise of the ecology of education, researchers study education from the perspective of ecology and treat the education system as an ecosystem, which is similar to the metaphor of language ecology that treats the language system as an ecosystem. The research purpose of the ecology of education is to maintain the internal balance of the educational ecosystem, such as the research on the ecological niche of education (Wu, 2020), online open courses (Li *et al.*, 2020), and the exploration of teaching models in the ecological environment of education (Liu, 2013). However, whether education is discussed from the perspective of ecology or not, it lacks multi-level and multi-dimensional studies from the perspective of language-cognition-behavior-environment, and the study of effective teaching models combined with explicit and implicit (conscious/unconscious) is even rarer. The curriculum-embedded ideological and political education or core values education has always been an important part of the education of Chinese colleges and universities. The aim of this article is to provide a new research path, especially for the socialist core values education.

## 2. RESEARCH BACKGROUND

### 2.1 Language and ecological environment research

It is of great value that “the ecological environment is a major political issue bearing on the Party’s mission and purpose, as well as a major social issue bearing on the people’s livelihood” and that “developing the economy as well as protecting the ecological

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environment is for the people's livelihood" (quoted from President Xi's important speech at the National Ecological and Environmental Protection Conference on May 18-19, 2018). China has always paid attention to environmental construction. Here, the environment not only refers to the natural environment but also involves the social and psychological environment. At the same time, it forms the environment of language use, namely, the context. Therefore, language can construct reality in the interaction with the environment (Halliday & Matthiessen, 1999), which has the function of creating a beautiful human environment.

International studies on education from the perspective of ecology are mainly based on ecological game theory (Nisar, 2015), application of the ecological theory (Kong *et al.*, 2021), literature ecology in the background of education (Manan & David, 2014), school bullying (Hong, 2020) and the integration of ecological objectives in campus strategy and spatial planning (Orenstein *et al.*, 2019). Language and context are often separated, and the relationship between language and environment is often isolated. The above problems are concentrated in the views of the external context (Halliday, 1985/1989) and the internal (cognitive) context (Sperber & Wilson, 1986). In this regard, Xiao *et al.* (2018) put forward the concept of ecological context, which was verified in experiments. Ecological context theory draws on ecosophy and the mechanism of interaction between language use and language environment, including natural, social and psychological environment (Stibbe, 2015). It follows the educational ecology law of the overall relevance, dynamic balance, and coevolution (Wu & Zhu, 2000), which believed that the study of context (the environment in which language is used) should deal with the ecological philosophical relations between whole and part, subjective and objective, dynamic and balance. The research on the ecological interaction among context factors is beneficial to the construction of current context, especially in foreign language learning, and to eliminate the differences between traditional context studies. However, the interaction between language and context has not been clarified in detail.

### **2.2 Ecological interactive context**

Based on the current situation of context research, the model of "ecological interactive context" (Xiao, 2017) came into being. It holds that context is a dynamic system of interaction or coordination between subjective and objective factors. The theoretical basis is to follow the law of the unity of opposites of dialectical materialism and unify epistemology, correctly treating the dialectical relationship between experience and reason, subjective and objective, as well as the relationship between context levels. The dialectical study of subjective and objective contextual factors is carried out in an interactive, dynamic, synergistic, and hierarchical manner. In this model, the context is divided into three parts: extralingual context (situational, cultural, social, and geographical environments), intralingual context (pronunciation, vocabulary, grammar, etc.), and cognitive/internal context (interactive knowledge of linguistic context and extralingual context variables, i.e. personal mental representations, such as schema, including formal schema and cultural content schema). Each of the three contexts contains three levels, which expand outward step by step. The upper level restricts the lower level, the outside restricts the inside, and the latter reflects the former. There are phonology, lexical grammar, and textual semantic levels in the intralingual context. Extralingual context includes three layers, viz. material context, contextual context, and cultural context. The cognitive context also includes three layers: information input, formal schema, and content schema.

In the context of ecological interaction, the ecological environment of language includes internal/cognitive context, extralingual context, and intralingual context. The use and survival of language cannot be separated from its ecological environment. The ecological environment co-exists with language, and the former constrains the latter, and the latter chooses the former. In the interaction between language and its external and internal environment, on the one hand, language plays a positive constructive effect on the social and natural environment, and the time scale is often faster and easier. On the other hand, the social environment and natural environment also exert effects on language and the internal environment (cognitive psychology), but such effects are relatively long and complex in the time scale. From the perspective of the ecolinguistic continuum (Xiao, 2021), one end of the language environment can be objective, such as the natural environment; the other end can be subjective, such as the psychological environment. What connects the two ends is based on language symbols, human cognition, etc. Therefore, the ecolinguistic continuum concept has the characteristics of the ecosystem such as integrity and diversity, dynamics and balance, relevance and continuity, coordination and coevolution (Xiao, 2021). We need to treat the core values education in the process of students' growth dialectically. Language plays an important role in this education because it has

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humanistic attributes, especially the role of the discourse of ecological civilization. Role-playing effectively and subtly enables students to construct a healthy physical and mental world in the context of ecological interaction. However, both explicit and implicit attention and processing are necessary for the context of ecological interaction, because human knowledge can be classified into explicit and implicit knowledge. For example, for children with low cognitive levels, their interaction environment is mostly proximal, material, concrete and immediate in the low-level interaction context. Thus, their cognitive processing is mostly implicit (Xiao *et al.*, 2021; Xiao, 2022).

### **2.3 Explicit and implicit learning**

In the process of learning, explicit and implicit knowledge have different influences on learners. The former refers to knowledge that can be systematically described, such as written or oral knowledge, while the latter refers to knowledge that cannot be described, such as the knowledge system in the brain (Bialystok, 1979). Adults and children have different explicit and implicit learning abilities. Since adult learners only have the explicit learning process (Chen and Chen, 2019), explicit knowledge is more conducive to college students' learning. However, through studies on children's language acquisition, it is found that children can master the language well because of their good implicit processing ability, i.e. unconscious and involuntary cognitive activities (Chen & Chen, 2019; Radford, 1997; Robinson, 1997), thus, implicit processing patterns can promote learning outcomes. The core values education of college students should combine explicit knowledge with an implicit processing model. Implicit processing of explicit core values knowledge in foreign language teaching should be the main model of core values education in foreign language courses at present.

## **3. STATUS OF CORE VALUES EDUCATION IN FOREIGN LANGUAGE CURRICULUM IN CHINA**

### **3.1 Core values education of foreign language majors in China**

Based on CNKI (Chinese National Knowledge Infrastructure), this paper uses the method of text mining to clarify the core values construction of foreign language majors. Using "foreign language & core values course" as the search term, and EI, CSSCI, and CSCD as the source categories, we retrieved a total of 60 papers (from 2009 to 2022, up to May/1/2022). The texts were processed by ROSTCM6 text mining software. It is found that the focus of core values teaching in the field of foreign language education is mainly on: 1) the concept, thought, task, and connotation of the teaching; 2) new liberal arts (integrated development); 3) blended teaching (moral education, culture, values); 4) principles and paths (practice); 5) new media (electronic education, integration), etc. There is no "ecological" keyword in the semantic network of "foreign language & core values education", which indicates that the literature focusing on core values education of foreign language majors from the ecological perspective is rare, and provides research space for the explicit and implicit teaching model of core values education and foreign language education from the perspective of ecological interactive context.

### **3.2 Key problems to be solved in core values education**

There are many paradigms based on curriculum theory, which yet lacks research from the perspective of multidimensional and multilevel interaction and collaboration in an ecological context. Curriculum-embedded ideological and political education or core values education in colleges and universities bears the great mission of training qualified builders and reliable successors. In the era of new media with ever-changing internet technology, to innovate the way of core values education in colleges and universities is a difficult problem (Ministry of Education network: focus on core values education in colleges and universities, editor's note). Therefore, the key problem to be solved is to use effective ways to enable students to learn in the osmosis (implicit processing) explicit knowledge, namely the core values content, especially the socialist core values, including prosperity, democracy, civilization, harmony, freedom, equality, justice, legal system, patriotism, dedication, integrity, and friendship.

## **4. TOWARDS AN IMPLICIT MODEL FROM THE PERSPECTIVE OF ECOLOGICAL INTERACTIVE CONTEXT**

Due to the diversity of language and the needs of the times facing international groups, foreign language majors have certain particularity. Then, how to combine curriculum-embedded ideological and political education with foreign language teaching from the perspective of ecological interactive context? President Xi believed that the value orientation of the youth determines the value orientation of the whole society in the future, and the youth is in the period of the formation and establishment of values,



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so it is very important to cultivate values in this period. The 18th National Congress of the Communist Party of China has always emphasized that ecological civilization construction should be highlighted. At the same time, ecological civilization education in colleges and universities has also become an important module of curriculum-embedded ideological and political education, and exploring new ideas and paradigms of ecological civilization education has become an important task in colleges and universities today. In the process of ecological civilization education, the traditional ideological and political education is mainly dominated by teachers' explicit "teaching", because the connotation of ecological civilization needs to be deliberately instilled, which is difficult to mobilize students' learning enthusiasm. Core values education should be combined with students' implicit processing learning methods to arouse students' inner ripples. According to the particularity of foreign language majors, it is necessary to create a new core values teaching method for curriculum-embedded ideological and political education for foreign language majors. There are three ways to contextualize explicit knowledge into implicit processing:

(1) Synergy between ecological civilization education and ecological values of foreign language majors. With the continuous improvement of China's international status and the need for foreign exchange, foreign language majors are required to tell Chinese stories. To tell China's stories well, one should first have the right values of ecological civilization and patriotic enthusiasm and have a thorough understanding of China's culture. For students who do not have these humanistic qualities, it is necessary to strengthen the reserve of relevant knowledge. This explicit learning process is the process of consciously learning the explicit knowledge of ecological civilization and then applying it to professional practice implicitly. Many students who are not familiar with the value system of ecological civilization need to access to and sort out materials so as to absorb appropriate knowledge into their own "China stories-telling". This is the interaction and coordination between external social context and individual internal psychological cognitive context.

(2) Synergy between ecological civilization education and students' ecological behavior. Language and behavior have long been proved to have a certain correlation, and the evolution from language to behavior can be divided into the following steps (Fig. 1): "Auditory-Phonological-Syntactic representations" is a linguistic process, while "Conceptual-Perceptual representations" is a psychological process. "Motor representations" is a behavioral process. Generally speaking, it is a process of language-psychological cognition- behavior.

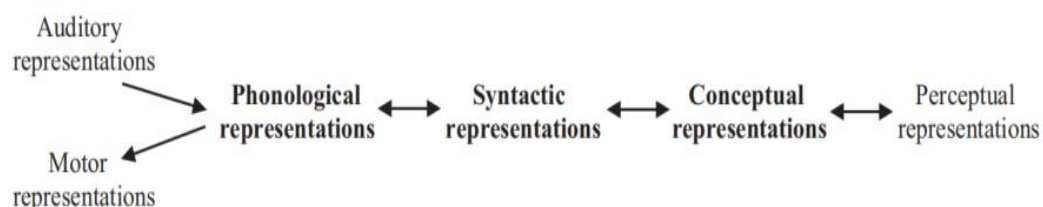


Fig. 1 The path from language to behavior (Jackendoff, 2019)

On the one hand, the purpose of curriculum-embedded ideological and political education for foreign language majors is to make college students love their country and society and have a collective concept, ideal, and morality. To examine whether the education is successful or not is manifested by good social behavior. On the other hand, it is to improve the knowledge and ability of foreign language majors. In addition to the curriculum-embedded ideological and political education mentioned above, college students majoring in foreign languages should also inherit and carry forward the excellent historical and cultural traditions of the Chinese nation and absorb all the excellent achievements of the development of human civilization. Language is the most effective and efficient means to carry out the core values contents, and only in this way can the students tell Chinese stories well. However, how to carry out effective collaborative curriculum-embedded ideological and political education for foreign language majors is very rare. As the literature mentioned above shows, most of the current studies focus on one-way studies and few studies on the effectiveness of combining it with language. Undeniably, the use of ecological discourse in curriculum-embedded ideological and political education is currently neglected by various universities. Exploring the application of ecological discourse skills in different contexts can help find the "obstacles" of the work of education in university courses. Ways and methods should be explored to optimize core values work in colleges and universities according to the above correlation, shape a more appropriate collaborative



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relationship, and enhance the synergistic effect.

(3) Synergy between teacher's niche and student's niche. Grinnell (1917) was one of the first to use the concept of "niche", arguing that niche refers to the microenvironment occupied by a species. Elton (1927) regarded niche as the position and function of a species in a community or ecosystem. In 1957, Hutchinson expanded the niche concept further. According to Hutchinson, an ecological niche describes all the biological and abiotic conditions that a species needs to survive. Based on this, Hutchinson proposed the concept of N-dimensional niche, i.e. every condition that affects an organism and every resource that an organism can use is regarded as a dimension, to define a possible range of an organism. By introducing the concept of niche into the field of education, the educational system is regarded as an ecosystem, and educational factors are regarded as ecological factors, which maintain balance through material conversion and energy flow. To behave as a model, a teacher should make good use of the platform and campus position, advocate socialist core values with their actions, and ignite students' yearning for truth, goodness, and beauty with their knowledge and experience (People's Daily online at

<http://cpc.people.com.cn/n/2014/0910/c64094-25629944.html>). The position of teachers in core values work can be seen. In the past teaching, the teachers always repeat what the book says, which made core values education rigid and formalized and affected the effect of core values teaching. Therefore, teachers and students should find their ecological niche and inherit core values elements from the perspective of the mutual positive influence of ecological elements.

In college foreign language classes, teachers can set up knowledge contests, game interactions, debates, film clips, and role plays related to core values. Literature about core values could also be discussed in class. At the same time, students are required to write some relevant comments after class or follow up after reading. In writing/creation and translation/role-playing, students carry out a lot of cognitive processing after reading and writing with the content and "role-based interaction analysis" (Xiao, 2022), which is expected to produce ecological interaction synergistic effect and thus promote the formation of their core values unconsciously (i.e. implicit processing). Taking the combination of English writing and core value teaching at a double first-class university in southern China as an example, in a study of the different understanding of the ecological philosophy of "justice" and the socialist core values of "justice", the majority of students are from the connotation of the associated to deepen understanding the concept of "justice" in the socialist core values. Participating students are well educated in the ecological environment and hold the value of "ecological justice", namely, human beings should be responsible for nature and protect the natural environment we depend on. Inspired by the harmonious relationship between humans and nature in "ecological justice", students believe that: 1) "social justice" focuses on harmonious relationships between people and society; 2) students should take an attitude against the unfair social order, social phenomenon and social behavior, and take corresponding behavior measures; 3) the social justice is the premise of a harmonious society and national stability, just as "ecological justice" is the premise for one to perform environmental action. For example, a person who is indifferent to the environment can hardly participate in environmental protection activities in daily life, and it is difficult for him to persuade others to care for the environment. Students are inspired to think about the concept of "social justice" from the concept of "ecological justice", which deepens students' learning and experience through implicit processing to manifest the knowledge connotation of the latter.

### 5. CONCLUSION

Interdisciplinary research has been a hot issue advocated by the scientific research field in recent years, and the comprehensive research of natural and social science has become the trend of contemporary scientific development (Kang & Zhao, 2018). The foreign language discipline itself also needs interdisciplinary research (Hu, 2007). From the perspective of ecological interactive context and ecolinguistic continuum, this paper discusses the implicit model of curriculum-embedded ideological and political education for foreign language majors in colleges and universities. It holds that the implicit processing model of explicit knowledge in different levels and dimensions is more effective to help students master the explicit knowledge, which provides the basis for the formulation and research direction of such curriculum-embedded ideological and political education, viz. the core values education for foreign language majors in the future.

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**Fundings:** This research was funded by the Higher Education Teaching Research and Reform/Quality Project of Guangdong (grant number YJG21-29-78) and South China Agricultural University (grant numbers HNJG21018/ZLGC21010), the Science and Technology Development Center of the Ministry of Education, China (Grant number 2021BCI01001), and the University students' Innovation Project, 2018.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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## Pelvic Fluid Collection Post Vaginal Delivery Treated with Ultrasonic Aspiration: A Case Report.



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### ABSTRACT

#### Background

Pelvic fluid collection can complicate a variety of abdominal surgeries and gynecological inflammations; nevertheless, it is considered a rare pathological consequence after normal vaginal delivery. It is characterized by a wall of thick fibrous tissue that delineate an area of pus and necrotic tissues.

#### Case presentation

A 31-year-old Saudi female presented with lower abdominal pain and dysuria 7 days following normal vaginal delivery. Apart from mild lower abdominal tenderness; the physical examination has been otherwise clear. The work-up showed leukocytosis and a high CRP level. The mild pelvic collection was shown on abdominal ultrasonography and the CT scan of the abdomen revealed an enhanced wall pelvic fluid collection measure of about 13\*3.3 cm. The patient received injectable antibiotics, and the fluid was aspirated initially, via a transvaginal route under ultrasound guidance. Days later, further fluid was aspirated with the placement of a catheter inside.

#### Conclusion

Physicians and obstetricians should have a high rate of suspicion for diagnosing Pelvic fluid collection. Injectable antibiotics and fluid aspiration with or without catheter placement are the mainstays for treatment.

**KEYWORDS:** Pelvic fluid collection, fluid aspiration, Saudi Arabia.

### INTRODUCTION

Free pelvic fluid plays an important physiological role in the female reproductive cycle; however, the accumulation of abnormal fluid within this area leads to pathological consequences. Pelvic abscess or other fluid collections following normal vaginal delivery is a rare clinical entity with a progressive presentation and a difficult therapeutic course [1]. It usually occurs following abdominal surgeries, genitourinary surgeries, inflammatory conditions such as appendicitis, Crohn's disease, diverticulitis, and complicated hysterectomy [2, 3, 4]. PFC is basically a wall of thick fibrous tissue that delineate an area of pus and necrotic tissues [5]. In pregnancy Young age group, prolonged labor, premature rupture of membrane and cephalopelvic disproportion are the major risk factors [6]. Lower abdominal pain, fever, and high white cell count after normal vaginal delivery should raise the susceptibility to pelvic fluid collection and necessities further workup [7]. Foul genital bleeding or discharge is another symptom for pelvic abscesses [8]. When PFCs suspected, empirical antibiotics should be started; however, sometimes antibiotics alone are not sufficient in most cases as it fails to reach adequate concentrations within the infected area [9]. Therefore, aspiration and drainage under ultrasound guidance are obligated in numerous cases [10]. Here, we report a rare case of a 31-year-old female who developed Pelvic fluid collection after normal vaginal delivery.

### CASE PRESENTATION

A 31-year-old Saudi female was admitted in the our hospital obstetrics and gynecology department with complaints of lower abdominal pain and mild urinary symptoms (dysuria) 7 days after a normal vaginal birth. The pain was rated as 2-3 according to the numerical rating scale for pain intensity. The condition was not associated with vomiting, diarrhea, chest pain, or cough. Apart from mild lower abdominal tenderness; the physical examination has been unremarkable. Her investigations on admission showed raised C-reactive protein (CRP), 25 mg/L. leukocytosis (19000/mm<sup>3</sup>) and high CRP of 30 and 31 mg/L respectively. Her urine and blood cultures were negative. Post-partum changes in both the uterus and adnexa along with mild pelvic collection (ascites) were shown on abdominal ultrasonography. CT scan of the abdomen revealed an enhanced wall pelvic fluid collection measuring about

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13\*3.3 cm in diameter seen in the vesicouterine region with stranding adjacent fat plan; suggestive of infected collection and abscess. However, the imaging rule out any suspicion of acute appendicitis or Retained products of conception (RPOCS). Intravenous Second generation cephalosporin were prescribed. Based on the above findings, she was referred to the interventional radiology department to aid in fluid drainage and appropriate management. Septated fluid was found in the anterior pelvic compartment during the Pre-procedure ultrasound. Under local anesthetic About 50 ml of serous fluid was aspirated using an 18 G needle under ultrasound guidance; no drain was inserted. Please note, that the post aspiration ultrasound shows almost complete resolution of the fluid, and she was commenced on Piperacillin/Tazobactam) injection on day 3 of admission as her CRP was rising with spikes of high grade fever. One day later, she complained of fever, mild lower abdominal pain, abdominal distention, and bloating. The physical examination was unremarkable, and her WCC was 19.68/mm<sup>3</sup>. On the following days (days 2 and 3 post aspiration), the patient's condition improved, the pain intensity decreased, fever subsided, and CRP declined. On the fourth- day post aspiration, the patient's abdomen was distended, and the CRP spiked to 65.1 mg/ L. Repeated Abdominopelvic ultrasound showed an anterior pelvic collection with separation volume 239ml and small pancreatic cystic lesion measured 0.6cm \*0.45cm. Aspirated fluid culture showed no growth, as a result, Piperacillin/Tazobactam) was discontinued, and she was commenced on an ertapenem injection of 1g once a day. Two days later, an MRI abdomen revealed a loculated large vesicouterine collection of 13 cm which raised suspicion of possible defect in the urinary bladder wall. A voiding cystourethrogram (VCUG) with catheterization was organized after discussion with urologist, however it showed normal urinary bladder without any focal lesions, or leakage of contrast from the bladder. Furthermore, no vesicoureteral reflux was noted on the full bladder or during voiding, and no fistulas formations was seen. In light of these findings; the patient underwent a second aspiration procedure under ultrasound guidance, and an 8 Fr drain was inserted. Importantly, it drained 400 ml of dark serous fluid, which was sent for cytology .The intravenous antibiotic were continued. She started to improve on day 7 and on day 9 her repeat ultrasound showed minimal amount of fluid. She was discharged home on day 10 with follow up in clinic

### DISCUSSION

Pelvic fluid collection is a potentially life-threatening condition if left untreated. Free fluid within the pelvic also called physiological free fluid was firstly reported by Novak et al in 1922 [11]. This fluid tends to play a fundamental role in transporting the ovum [12, 13]. It is most likely encountered during pregnancy and the menstrual cycle as a result of follicular rupture [13]. A high level of estrogen during these periods leads to a raise in the capillary permeability and hence, ovarian fluid exudation [14]. In normal cycle this fluid tends to subside near menstruation [14]. Our patient who was a 31-year-old female developed Pelvic fluid collection 7 days after a normal vaginal delivery without noticeable triggering factors. The absence of any histories of surgeries or inflammatory conditions, in this case, is distinctive; and demands a high rate of suspicion to diagnose such condition. A tubo-ovarian abscess is another common cause of Pelvic fluid collection [15]. It is complicated pelvic inflammatory disease, and presents in similar manner as Pelvic fluid collection; however, the presences of adnexal mass along with offensive vaginal discharge are unique for Tubo-ovarian abscess [16]. In our case, the absence of these manifestations made the diagnosis of Tubo-ovarian abscess unlikely. Day Tania and her colleague reported an interesting case of a 20-year-old female who developed pelvic abscess 20 days following normal vaginal delivery. Her patient presented with abdominal pain and constipation and was diagnosed with a pelvic abscess after a computer tomography scan [1]. MR Toglia and his colleague reported 38 females who developed post-hysterectomy Pelvic fluid collections. They experienced numerous presentations during the trial; nevertheless, they use pelvic examination and transvaginal ultrasound to make the appropriate diagnosis [3]. Interestingly, only one patient was evident prior to the sonography. In addition, the laboratory test particularly the white cell count, ESR, and CRP (inflammatory markers) are extremely helpful in both diagnosis and treatment response [5, 17]. Here, the combination of the clinical presentation of elevated white cell count and inflammatory markers along with the presence of pelvic fluid collections in imaging was highly suggestive of the diagnosis.

Antibiotics are usually the preferred first-line therapy but, medical therapy is usually insufficient in the majority of cases [5, 15]. Drainage of the pelvic fluid is a gold standard technique and usually leads to favorable outcomes. It can be achieved by numerous routes; such as transvaginally or through a percutaneous approach; and is usually under ultrasound guidance [5, 10]. The anterior percutaneous transabdominal approach can ease catheter placement and subsequently, post-procedure care, however, it is limited to certain cases because sometimes the fluid collections are obscure by the effects of bowel, bladder, or uterus. Therefore, transvaginal drainage under ultrasound guidance is preferred. It is usually performed by an interventional radiologist following administration of a foley catheter (or by asking the patient to empty the bladder) as in our case; then, under sterile aseptic conditions and ultrasound guidance; the fluid drainage is performed.[18, 19]. In the case of aspiration only, the whole fluid should be drained to minimize the risk of getting a life-threatening superinfection. After that, the fluids have to be sent for microscopic examination [18, 19]. The decision of making aspiration only or catheter drainage needs an expert operator. If the operator fails to aspirate the entire fluid, or the aspirated fluid contained purulent material; the catheter should be left in place for further

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drainage [15]. Our patient underwent fluid aspiration twice via abdominal route under ultrasound guidance. In the first attempt, the entire fluid was aspirated and no catheter was put in place. The second time, however, the fluid aspirated, and a catheter was put inside for additional drainage. Anuradha Saokar et al concluded in their report that the transvaginal route is generally safe; nevertheless, catheter drainage can be associated with future complications [15]. If the pelvic collections are due to a Tubo-ovarian abscess; broad-spectrum antibiotics are administered with or without the need for surgical intervention. In one clinical trial; Gjelland K et al reported a high success rate of using antibiotics alone to treat Tubo-ovarian abscess; however, in another study, Anuradha Saokar concluded that even patients who received the antibiotics to treat the abscess; later necessitated catheter placement for optimum fluid drainage [20]. Although it is a safe procedure; bleeding and bowel injury can occur. In our case no complications was developed.

### CONCLUSIONS

Pelvic fluid collections following uncomplicated normal vaginal delivery is extremely rare. The development of lower abdominal pain and fever with a high white cell count should raise the susceptibility for pelvic fluid collections and necessitate further workup and imaging. Broad-spectrum antibiotics along with fluid drainage with or without catheter placement lead to favorable outcomes in the majority of cases.

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## Anxiety Soccer Players of Soccer Academy Fajar South Bolaang Mongondow District Following Training during the Covid-19 Pandemic



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**ABSTRACT:** During the Covid-19 pandemic, there was a decline in the attendance of athletes who took part in the training. Athletes always experience anxiety every time they go to soccer practice. Anxiety is indicated by an increasingly fast heart rate, cold sweat, stomach feeling uncomfortable, restless during training, and decreased focus. This study aims to determine the anxiety of Soccer Academy Fajar Selatan football players, South Bolaang Mongondow Regency following training during the Covid-19 pandemic. This research is quantitative descriptive. The population in this study were Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency, Age Group 12-15 years, amounting to 72 athletes who were taken based on total sampling. The instrument in this research is a questionnaire. Data analysis used descriptive percentages. The results showed that the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic was in the "very low" category of 0.00% (0 athletes), "low" 33.33% (24 athletes), "high" by 66.67% (48 athletes), and "very high" by 0.00% (0 athletes). It can be concluded that the anxiety of Soccer Academy Fajar Selatan soccer players in South Bolaang Mongondow Regency following training during the Covid-19 pandemic was in the high category.

**KEYWORDS:** anxiety, training, Covid-19 pandemic.

### INTRODUCTION

The pandemic period has had many impacts on society, including psychological impacts, such as anxiety because the virus can be transmitted from someone who is not in a good or unhealthy condition and is transmitted to people who are healthy (Wheaton et al., 2021); (Stankovska et al., 2020). The pandemic has also had a very significant impact on sports on a global scale, including the cancellation of various sporting events including professional sports leagues around the world, and championships, including the postponement of the 2020 Olympics in Tokyo. In Indonesia, the implementation of The National Sports Week 2020 has also been postponed to 2021. This postponement of course has an impact on all athletes and sportspeople, considering that the implementation of events regularly has an important role in the lives of athletes (Grix et al., 2021); (Oblinger-Peters & Krenn, 2020); (Stambulova et al., 2022); (Taku & Arai, 2020). Cancellation and postponement of sporting events can have an impact on athletes including on their mental health (Şenışık et al., 2021); (Liu, 2020); (Scerri & Grech, 2021); (Jia et al., 2022).

Prevention of transmission measures in the form of strict control of activities in the community, one of which is the soccer practice process at Fajar Selatan Soccer Academy, South Bolaang Mongondow Regency. Soccer is the most popular sport in the world, especially in Indonesia. The training process must continue to be carried out because athletes have a responsibility to practice and maintain their appearance or performance to still produce their best performance. In the implementation process, of course, athletes experience various conditions that affect the training process, both physiological physique and physiologically, especially amid the Covid-19 pandemic, especially anxiety is quite disturbed.

Anxiety is a psychological element that describes the feelings, emotional states that a person has when facing reality or events in his life (Urcos et al., 2020); (Perrotta, 2019). Anxiety often arises when athletes are unsure or afraid to do something related to performance. Anxiety faced by athletes can affect performance on a different scale from each individual athlete. Anxiety is a condition that occurs when the physiological condition of the athlete's body seems to feel depressed. As a result, his heart rate increases excessively (Sobhani et al., 2022); (Côrte et al., 2020). Anxiety is a psychological problem that arises in every individual. The state is often unclear, but the anxiety itself is often felt.

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The significant impact of excessive anxiety can affect the physical condition. When a person experiences anxiety, it will indirectly increase his heart rate. The physical impact of anxiety will cause dizziness, headaches, and others. A physical impact will affect a person's performance; this impact will also affect a person's immunity because anxiety will stimulate an increase in the production of the hormone cortisol in the body. This hormone will further suppress the body's immunity (Chu et al., 2021); (Hinds & Sanchez, 2022).

Soccer athletes during the Covid-19 pandemic experienced difficult times because they could not carry out regular training, and even training facilities were closed due to this pandemic. As a result, many athletes experienced training anxiety for fear of being exposed to this deadly virus. Entering the Adaptation of New Habits or its global language is entering the New Normal period; several activities can already be carried out with health rules or protocols that must be obeyed by people who will carry out activities. The importance of following the health protocol rules that must be implemented during the New Normal is to reduce the spread of the Covid-19 virus—always wearing a mask when outside the house, diligently washing hands, and keeping a distance, are health protocols that must be obeyed by everyone who does activities outside the home (Yulistiana et al., 2022); (Kahar et al., 2020).

The South Fajar Soccer Academy trainer, South Bolaang Mongondow Regency, always requires athletes to wash their hands, check their temperature, and wear masks when leaving for training. The trainer also stated that during the Covid-19 pandemic, there was a decline in the attendance of athletes who took part in the training. Every training is carried out; some athletes will not attend the training. This is because the Soccer Academy Fajar Selatan, Bolaang Mongondow Selatan Regency, appealed to its athletes not to train when their body is not feeling well or sick. The trainer stated that parents have serious concerns when their children take part in training; there are even athletes who are prohibited from participating in training during the Covid-19 pandemic.

### METHOD

This research is quantitative descriptive. Descriptive research design is a research design that aims to describe or describe systematically, factually, and objectively accurately an object of observation that occurs in the present. This study was to determine the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency following training during the Covid-19 pandemic. The population in the study was Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency, Age Group 12-15 years, totaling 72 athletes. The sampling technique is total sampling, meaning that the entire population is taken as a sample. The instrument or tool used is a closed questionnaire. A closed questionnaire is a questionnaire that is presented in such a way that the respondent only needs to give a checklist mark (v) in the appropriate column or place, with a direct questionnaire using a multilevel scale. The stratified scale in this questionnaire uses a modified Likert scale with four answer choices. The anxiety instrument in this study is adapted from the theory (Tangkudung, 2022). instrument grid in Table 1:

**Table 1. Instrument Guidelines**

Variable	Factor	Indicator	Items	
			Favorable	Unfavorable
Anxiety of soccer players attending training during the Covid-19 pandemic	Before Training	Dramatic changes in behavior	2, 4	1, 3, 5
		Physical changes and psychology dramatically	8, 11, 13	9, 10, 12
		<i>Trait Anxiety</i>	15, 16	14, 17, 18
	During Training	Dramatic changes in behavior	20	19
		Physical changes and psychology dramatically	21, 23, 26	22, 24, 25, 27
		<i>State Anxiety</i>	30, 33, 34, 35	28, 29, 31, 32
<b>Total</b>			<b>35</b>	

The instruments in this study have been validated by expert lecturers. Furthermore, before being used for research, this instrument was piloted with 28 athletes. The results of the validity analysis contained 1 to 35 statements on the questionnaire sheet. All of the questions are valid, as evidenced by ( $r$  count >  $r$  table). Based on the results of the reliability test, Cronbach's Alpha value was 0.966 0.70, it can be said that the research instrument has high reliability.

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### FINDING

Descriptive statistical data from the anxiety research of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic, the lowest score (minimum) was 72.00, the highest score (maximum) 111.00, the average (mean) 98, 13, median (median) 99.00, frequently occurring value (mode) 103.00, standard deviation (SD) 8.33. The complete results can be seen in table 2:

**Table 2. Descriptive Statistics of Anxiety Soccer Academy Soccer Players Fajar Selatan South Bolaang Mongondow Regency Attending Training During the Covid-19 Pandemic**

Statistic	
<i>N</i>	72
<i>Mean</i>	91,32
<i>Median</i>	91,50
<i>Mode</i>	94,00
<i>Std, Deviation</i>	6,92
<i>Minimum</i>	72,00
<i>Maximum</i>	105,00

When displayed in the form of an assessment norm, the anxiety of Soccer Academy Fajar Selatan football players in South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic is presented in table 3:

**Table 3. Anxiety Assessment Norms Following Training During the Covid-19 Pandemic**

No	Interval	Category	Frequency	Percentage
1	$114 < X$	Very high	0	0,00%
2	$88 \leq X < 114$	High	48	66,67%
3	$62 < X \leq 88$	Low	24	33,33%
4	$X \leq 62$	Very low	0	0,00%
<b>total</b>			<b>72</b>	<b>100%</b>

Based on table 3 above, shows that the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic is in the "very low" category of 0.00% (0 athletes), "low" of 33.33% (24 athletes), "high" was 66.67% (48 athletes), and "very high" was 0.00% (0 athletes).

### Factors Before Training

A descriptive statistical description of the anxiety of Soccer Academy Fajar Selatan football players, South Bolaang Mongondow Regency following training during the Covid-19 pandemic based on the complete pre-training factor, can be seen in table 4:

**Table 4. Descriptive Statistics Factors Before Training**

Statistic	
<i>N</i>	72
<i>Mean</i>	45,51
<i>Median</i>	46,00
<i>Mode</i>	43,00
<i>Std, Deviation</i>	4,92
<i>Minimum</i>	35,00
<i>Maximum</i>	54,00

When displayed in the form of an assessment norm, the anxiety of Soccer Academy Fajar Selatan football players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on internal factors in table 5:

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**Table 5. Assessment Norms Based on Factors Before Training**

No	Interval	Category	Frequency	Percentage
1	$59 < X$	Very High	0	0,00%
2	$45 \leq X < 59$	High	37	51,39%
3	$31 < X \leq 45$	Low	35	48,61%
4	$X \leq 31$	Very Low	0	0,00%
<b>Total</b>			<b>72</b>	<b>100%</b>

Based on the five above, it shows that the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on factors before training was in the "very low" category of 0.00% (0 athletes), "low" of 48.61% (35 athletes), "high" 51.39% (39 athletes), and "very high" 0.00% (0 athletes).

**Table 6. Anxiety-based Indicators on Pre-Training Factors**

No	Indicator	Mean	Category
1	Perubahan tingkah laku secara dramatis	2,57	Tinggi
2	Perubahan fisik dan psikologi secara dramatis	2,55	Tinggi
3	<i>Trait Anxiety</i>	2,46	Rendah

Based on Table 6 above, shows the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on indicators of dramatic behavioral changes of 2.57 high categories, dramatic physical and psychological changes of 2.55 high category, trait anxiety of 2.46 low category.

### Factor During Training

A descriptive statistical analysis of the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on factors during training in full, can be seen in table 7:

**Table 7. Descriptive Statistical Factors During Training**

Statistic	
<i>N</i>	72
<i>Mean</i>	45,81
<i>Median</i>	46,00
<i>Mode</i>	51,00
<i>Std, Deviation</i>	5,50
<i>Minimum</i>	33,00
<i>Maximum</i>	56,00

When displayed in the form of an assessment norm, the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on internal factors in table 8 below:

**Table 8. Norms of Assessment Based on Factors During Training**

No	Interval	Categori	Frequency	Percentage
1	$72 < X$	Sangat Tinggi	0	0,00%
2	$43 \leq X < 72$	Tinggi	47	65,28%
3	$31 < X \leq 43$	Rendah	25	34,72%
4	$X \leq 31$	Sangat Rendah	0	0,00%
<b>Total</b>			<b>72</b>	<b>100%</b>

Based on table 8 above, shows that the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on factors during training were in the "very low" category

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of 0.00% (0 athletes), "low" of 34.72% (25 athletes), "high" 62.58% (47 athletes), and "very high" 3.64% (2 athletes). The anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on indicators of dramatic changes in behavior, dramatic physical and psychological changes, and state Anxiety is presented in table 9:

**Table 9. Anxiety by Indicator on Factors During Training**

No	Indicator	Mean	Categori
1	Dramatic changes in behavior	3,00	High
2	Dramatic physical and psychological changes	2,86	High
3	State Anxiety	2,47	Low

Based on Table 9 above, shows the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic based on indicators of dramatic behavioral changes of 3.00 in the high category, dramatic physical and psychological changes of 2.86 high categories, state anxiety of 2.47 low category.

### DISCUSSION

The results showed that 66.67% of athletes had high anxiety. Football athletes during the Covid-19 pandemic experienced difficult times because they could not carry out regular training, and even training facilities were closed due to this pandemic. As a result, many athletes experienced training anxiety for fear of being exposed to this very deadly virus. The presence of the Covid-19 virus makes athletes more easily panicked, anxious, worried, and even causes excessive anxiety, especially during soccer practice (Bhattarai et al., 2021); (Reardon et al., 2021); (Woodford & Bussey, 2021).

Anxiety is a psychological element that describes a person's feelings and emotional states when facing reality or events in his life (Lang, 2019). Anxiety often arises when athletes are unsure or afraid to do something related to performance. Anxiety faced by athletes can affect performance on a different scale for each athlete. Anxiety is a condition that occurs when the physiological condition of the athlete's body seems to feel depressed. As a result, his heart rate increases excessively (Sutcliffe & Greenberger, 2020). Anxiety is a psychological problem that arises in every individual. The state is often unclear, but the anxiety itself is often felt.

Furthermore, the results showed that 33,33% of athletes had low anxiety. This is because the prevention of transmission is in the form of strict control of activities in the community, one of which is the soccer practice process at SOCCER ACADEMY Fajar Selatan, South Bolaang Mongondow Regency. Covid-19 has been running for about three years in Indonesia, most people have been vaccinated three times, so it is quite effective in suppressing the transmission of the Covid-19 virus. The anxiety of athletes in the low category is possible because athletes have more confidence in the presence of vaccines that have been received and strict controls carried out by the club. Football is the most popular sport in the world, and Indonesia is no exception. The training process must continue to be carried out because athletes are responsible for practicing and maintaining their appearance or performance to produce their best performance still. In the implementation process, athletes experience various conditions that affect the training process, both psychologically and physiologically.

Anxiety reactions have three components, namely: (1) the emotional component namely the anxiety component related to individual perceptions of the psychological effects of anxiety. (2) Cognitive component, namely the existence of individual concerns about the consequences that may be experienced or negative expectations and assumptions about oneself. If anxiety increases, it will interfere with the individual's ability to think clearly, solve problems and meet environmental demands. (3) Physiological components, namely the body's reaction to the presence of anxiety that arises, can encourage the emergence of movements in certain body parts. The movements that occur are mostly the result of the work of the autonomic nervous system, which controls various muscles and glands of the body (Spielberger, 2019).

Based on research (Marsha & Wijaya, 2021) that the factors that cause anxiety during this pandemic consist of internal and external. Internal factors of anxiety during a pandemic include genetics, less strong adaptation mechanisms such as when wearing a mask, staying at home, keeping a distance, and other changes during a pandemic like this, certain personality types such as anxiety types, weak physical factors (comorbid disease) which becomes the weight of the emergence of anxiety. External anxiety factors during the Covid-19 pandemic include social media information, environmental stigma, food, clothing, finances, work problems, and physical and social activities limitations.



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### **Factor Before Training**

Descriptive statistical anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency following training during the Covid-19 pandemic based on pre-training factors in the high category. The anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency, was participating in training during the Covid-19 pandemic based on indicators of dramatic behavioral changes of 2.57 high categories, physical and psychological changes of 2.55 high categories, trait anxiety of 2,46 low categories.

The significant impact of excessive anxiety can affect physical condition because when a person experiences anxiety, it will indirectly increase his heart rate. In addition to impacting psychology, anxiety's consequences also affect a person's physical condition. This impact will cause dizziness, headaches, and others. A physical impact will affect a person's performance; this impact will also affect a person's immunity because anxiety will stimulate an increase in the production of the hormone cortisol in the body. This hormone will further suppress immunity (Chu et al., 2021); (Hinds & Sanchez, 2022).

The characteristics of anxiety are as follows. (1) Physical reactions, namely sweaty palms, tense muscles, racing heart, flushed cheeks, and dizziness; (2) Behavioral reactions, namely avoiding situations when anxiety can occur, leaving situations when anxiety begins to occur, trying to do things perfectly, or trying to prevent harm; (3) Thought reactions, namely overthinking about danger, thinking that you are unable to solve problems, not attaching importance to available help, worrying, and thinking about bad things; (4) Mood like nervous, irritated, anxious, and panicked.

### **Faktor During Training**

Descriptive statistics on the anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency, was participating in training during the Covid-19 pandemic based on factors in the high category training. The anxiety of Soccer Academy Fajar Selatan soccer players, South Bolaang Mongondow Regency, was participating in training during the Covid-19 pandemic based on indicators of dramatic behavioral changes of 3.00 high category, physical and psychological changes of 2.86 high categories, state anxiety of 2,47 low categories.

Based on the observations at Soccer Academy Fajar Selatan, South Bolaang Mongondow Regency, the training process is still carried out according to the training schedule. Training are also carried out by health protocols such as mandatory wearing masks, maintaining distance, checking body temperature, and washing hands with soap or hand sanitizer. Based on an interview with the coach of Soccer Academy Fajar Selatan, Bolaang Mongondow Selatan Regency, he stated the coach admitted that he experienced anxiety when going to train, even though the coach had carried out the health protocol accordingly, the anxiety remained. The coach stated that the training schedule often changed when the Covid-19 pandemic hit; this was done by Soccer Academy Fajar Selatan, Bolaang Mongondow Selatan Regency, to respect the decision of the local institution.

The South Fajar Soccer Academy coach, South Bolaang Mongondow Regency, always requires athletes to wash their hands, check their temperature, and wear masks when leaving for training. The coach also stated that during the Covid-19 pandemic, there was a decline in the attendance of athletes who took part in the training. Every training is carried out; some athletes will not attend the training. This is because the Soccer Academy Fajar Selatan, Bolaang Mongondow Selatan Regency, appealed to its athletes not to train when their body is not feeling well or sick. The coach stated that parents have high concerns when their children take part in training; there are even athletes who are prohibited from participating in training during the Covid-19 pandemic.

Trait anxiety is a feeling of anxiety that is a personal trait / innate (anxiety nature). Trait anxiety is a predisposition to perceive environmental situations that threaten him. An athlete has trait anxiety, so the manifestation of anxiety will always be excessive and dominate the psychological aspect. his is a serious obstacle for the athlete to look good (Marsico et al., 2019); (Yu et al., 2018).

### **CONCLUSION**

Based on the results of data analysis and discussion, it can be concluded that the anxiety of Soccer Academy Fajar Selatan soccer players in South Bolaang Mongondow Regency participating in training during the Covid-19 pandemic is in the "deficient" category of 0.00% (0 athletes), "low" of 33,33% (24 athletes), "high" 66.67% (48 athletes), and "very high" 0.00% (0 athletes).

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## **The Role of the Faculty in Information Literacy Instruction**



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**ABSTRACT:** This paper presents an extract from the cross sectional study conducted at the University of Lusaka to assess the information literacy of skills of students. Information literacy has been found to be the necessary skill for students at the tertiary level of education. This has been necessitated by the advancement in technology coupled with the exponential growth of information, both physical and in digital format, which demands that students should have necessary competencies for them to effectively, and efficiently access, use and share the information to solve problems and create new knowledge.

The study adopted a mixed method research approach. The survey design was used for data collection. The survey followed a cross-sectional approach and employed questionnaires as instruments of data collection. The Statistical Package for Social Sciences (SPSS), Version 16, was used for data analysis. The study population was made up of full-time university students from all the five faculties of the university. These were the faculties of Law, Business, Education, Social Sciences & Technology (ESST), Health Sciences and Graduate Studies. The sample size of One hundred students were sampled using the proportional stratified random sampling. The findings from the study revealed that the students faced challenges to find the required information in the library. The challenges included their inability to access the needed information, synthesise their work and provide references. The findings were attributed to many factors which included the lack of a systematic approach information literacy skills.

**KEYWORDS:** Information literacy, user education, communication skills, librarian and faculty collaboration.

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### **INTRODUCTION**

Since the genesis of university education, academic libraries have played critically-important roles as focal points for teaching, learning, and research and as providers of standard information resources within their host universities (Meulemans and Carr, 2012; Anunobi, 2008). For centuries, academic libraries have existed primarily for curation of library collections and to serve the students and faculty members, by making available the collection of scholarly resources, necessary for the promotion of academic activities in parent institutions (Fallin, 2015). Kargbo (2001) outlines the objectives of academic libraries to include:

- Provision of facilities for study and research geared closely to the academic setting of the parent institution
- To secure, organise and service information sources required for the institutional programme
- Providing reading materials for academic staff and keeping them abreast with the latest information in their fields of study for teaching and doing individual research
- Instructing students, specifically first-year students, in the effective use of the library and its holdings
- Encouraging students to develop the habit of reading and self-directed learning, thereby contributing to their intellectual development.

Libraries have however realised that the storage and making available reading materials to clients in itself is not sufficient. The library users need to gain access to the needed information, in a manner, that would enable the appropriate use of information by them (Kuan-nien and Pie-chun, 2011:400). Kargbo (2001), citing Gelford (1968), asserts that the library should not be operated as a mere store house of books attached to a reading room, but as a dynamic instrument of education. It should provide the book and non-book materials needed by the teaching staff and students of its parent institution; it should process these materials, organise and arrange them in a systematic manner and create amenities for their use.

### **BACKGROUND LITERATURE**

For many years, libraries have been conducting library orientation or user education, essentially designed to acquaint new students with the available library resources and to enable them to explore effectively the existing knowledge base and ameliorate

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their information search skills (Anunobi and Ukwoma, 2016). In many universities, this has been the mere introduction of students to collections and services, with the primary aim of transferring the skills that would enable the library users to identify, select, locate and retrieve the relevant information resources and make the users appreciate the library as the top source of inquiry, by using the collection effectively (Idiodi, 2005).

With the advent of the 21st Century however, the libraries in academic institutions across the world have been experiencing a paradigm shift in procuring, storing and retrieving information resources, under the impact of the application of Information Communication Technologies (ICT) (Stordy, 2015; Tripathi and Kumar, 2014). Digital technology has pervaded every aspect of civilization because of its speed, accuracy and cost effectiveness. It has revolutionized, not only the way recorded knowledge, historical records, and a host of other kinds of communication are packaged and processed, but also the way scholars create, disseminate and preserve the new knowledge, and how users seek and gain access to these materials (Anunobi and Ukwoma, 2016: 344; Adzobu, 2014:38).

The internet in particular, has affected information provision in a number of ways - internet databases, electronic journals and e-books have become the mainstream. activities, providing access to an immense volume of information through the networked electronic and increasingly complex environment, in a variety of disciplines and languages across the globe (Ukachi, 2015b; Kuan-Nien, Pie-Chun and Sung-Shan, 2011). Students now, unlike in the past, are able to access information with a degree of variability in approaches, aided by the use of integrated social networking tools, with increasing sense of speed and urgency (Stowe, 2011).

The profusion of these information sources has made it difficult for students to use information appropriately and effectively, not because students are overwhelmed by this flood of data, but because unlike print resources, useful and reliable information on the internet is not readily available, because much of this information is not organised (Choy and Goh, 2016; Fjallbrant 2000). This situation has brought about considerable challenges for libraries and their instruction programmes with resultant glitches for students to evaluate, understand and use information in an ethical and lawful manner (Baro and Fyneman, 2009). This has intensified the need for students to be equipped with the appropriate capabilities of information literacy skills, for them to efficiently utilise and handle these print and electronic materials (Critz, Axford, Baer, Doty, Lowe and Renfro, 2012; Isfandyari, Moghaddam and Kashi-Nahanji, 2011). This presupposes the reality of competent users, who have learnt and developed a set of skills that transcend the basic acquaintance with the computer, but possess the skills needed to explore the available information resource base, that lead to the acquisition of other literacy capabilities (Malliari and Nitsos, 2008; Anunobi and Ukwoma, 2016).

These sets of skills can be summed up as information literacy. Spiranec, Zorica and Kos (2015: 247) and Nicholson and Eva (2011), define information literacy as a functionalistic term that describes a set of abilities requiring individuals to recognise when information is needed and have the ability to locate, evaluate and effectively use the needed information. Broadly, the definition encompasses a wide range of initiatives in higher education, which seek to meet broad demands of the information society. This includes the adoption of appropriate information behaviour and being aware of the importance of wise and ethical use of information.

Andersen (2006:214) and Anunobi and Ukwoma (2016: 345) amplify information literacy to cover the skills, ability or competence in finding, evaluating, using and sorting out relevant information, which extends beyond the mere knowledge of the location and availability of the materials, to a deeper understanding and application of such information in the learner's daily life. This includes the provision of content that helps students to recognise the need for information, the accuracy and completeness of information, the ability to identify the potential sources of information and develop successful search strategies to access, evaluate and integrate the findings in their knowledge base. The Association of College and Research Libraries (ACRL) (2000:4) has identified the key areas of desirable behaviour that the information literate student should possess. This set of attributes embraces the abilities to:

- recognise and understand an information need or problem
- discern the appropriate sources to satisfy the information need or problem
- evaluate, synthesise, and apply the information as it applies to the need or problem
- discern when enough information has been gathered to satisfy the need or problem
- Use the information and information technology appropriately.

The key issues here are that being information literate is a process that translates into gaining the tools that assist the development of information literacy, necessary not only in education practices, but also in occupational practices, in the same way that study skills aid the learning process of a student (Idiodi, 2005). It implies the acquisition of a higher level understanding of the fact that

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information exists in its own right as intellectual content, regardless of the vehicle which carries it (paper or electronic). This also relates to the ability to work in a selective and intelligent way across these media (Joint, 2005).

### **IMPORTANCE OF INFORMATION LITERACY TO UNIVERSITY EDUCATION**

University education demands that students acquire the study of established knowledge and learn the process of producing new knowledge and receive exposure to ways and means of lifelong learning (Anunobi and Ukwoma, 2016). It is intended to prepare students for demands of society beyond the confines of the lecture rooms and the literature embedded in books, placing particular emphasis on learning strategies, necessary for survival in an increasingly competitive work environment. To this end, students are expected to acquire information searching, handling and use, behaviour and skills, necessary for problem solving and self-directed learning. The way students organise their learning and search for academic information to complete their various tasks, is therefore crucial to their overall performance at the end of the day (Ajiboye and Tella, 2007).

Across the world, libraries have been developing strategies and policies aimed at imparting sound information practices in students and presenting them with opportunities that will enable them to take advantage of available information resources. The justification for conducting user instruction has been to introduce users to the various library and information services at their disposal; to empower them to recognise their need for information and make them independent users in finding information for academic purpose (Anunobi and Ukwoma, 2016; Moyo and Mavodza, 2016).

A number of studies have however shown that the traditional methods of instruction, though practiced in many universities, were only capable of creating poor patterns of information use, because the information skills training the students were exposed to, was too mechanistic and complex for the naive user to master (Joint, 2005; Sinikara and Jarvelainen, 2003). It has also been observed that the methods of instruction limit information literacy to the acquisition of decontextualised skills, which have been perceived to be a means to achieving a specific and instrumentally defined purpose, which may not be applicable in real life situations, such as addressing the challenges students' faced in accessing information, vis-à-vis the growth of electronic information and the advancement in information technology (Spiranec et.al, 2015).

In Zambia, like other developing countries, university students come from the diverse background, many of which are from backgrounds which have had limited facilities, with regard to availability of libraries and designated platforms for reading facilities. Even where such facilities exist, many of them can be assumed to lack in many areas such as library materials and qualified personnel to teach library patrons how to use the libraries (Nabuyanda, 2011). It can therefore be argued that many students who go through this system of education enter the university with little or no information searching skills. As a consequence, such students have challenges to access and use the required materials in the library for their assignments and end of term papers.

### **THE ROLE OF THE FACULTY IN INFORMATION LITERACY INSTRUCTION**

Academic faculty members play a significant and authoritative role in the academic life of students. According to Jumonville (2014) and Pinto (2016), academic faculty exerts a great deal of influence in relation to their teaching, research and other academic activities. As vital agents and facilitators of students' learning experience, academic staff are potentially well positioned to influence on the information literacy efforts.

It was however noted from this study, on the faculty perspective that, although information literacy instruction was seen as an important component of the student learning process, many of faculty simultaneously perceived that the students' information literacy proficiency to be lacking and below the expected standards. The difference in opinions expressed was characteristic of the information literacy practices not only at the University of Lusaka, but other universities as well. Literature has presented that the user education programme which was being practiced in many universities did not have much impact on the students' information seeking activities as it was characteristic of old instructional approaches which were mainly offered outside the curriculum framework, and had a deliberate focus on completion of course assignments and other academic tasks the students were engaged in (Birch, 2012; Moore, 1996). In this scenario, a librarian was only viewed as someone who should help students to find information whereas the lecturer was regarded as someone who should make them use it.

This view established that the information skill training conducted in many universities did not pitch at the individual student's point of need. It was presented with the view that students were already conversant with the use of the library resources. On the centrally, proponents of information literacy instruction, Davis, Lundstrom and Martin (2011:687) have contended that the most used and probably most effective way to transfer the skills into the students, should be the integration of library instruction into the curriculum and giving students assignments and other academic work, that would make them connect the information literacy



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instruction, to the real situation obtaining in their academic learning environment. This is because students would not see any value in the instruction programs that were offered on a voluntary basis and removed from classroom instruction. Kuan-Nien and Pei-Chun (2011:404) similarly, observed that implementation of information literacy programs should include the establishment of an all-inclusive information literacy programme and should be viewed as a responsibility of all parties involved in the students' learning cycle. This includes all staff, faculty, librarians and administrators and should be learner centered and discipline specific, based on the students' individual learning needs.

These findings are typical of the view of Kanguha (2016) and Brendle-Moczuk (2006). They note that the effectiveness of the techniques used to establish the information literacy learning experiences, lied in the way courses were structured. This observation brings out the understanding that giving students a research or term paper to work on and that involved the faculty taking them through the process of research and citations procedures, was a positive initiative to make students acquire the basic information literacy skills. This engagement supported by self-initiated activities, such as classroom assignments and other information seeking activities, was a sure way to help students to navigate the library, access materials, evaluate them and also be able to realise their own learning needs. This stirred the students' desire to acquire knowledge and skills and also to be able to apply them with confidence.

The explanations herein are supported by Meulemans and Carr (2012:80), who in their submission have noted that students were more likely to become information literate if the value was placed on the skills instructional process, which could only be done if information was presented within disciplinary contexts. It was noted that a discipline specific library instruction that teaches students how to locate, evaluate and use information is an effective approach, essential for creating learning opportunities for students. This is because it makes them to identify and think more critically about the credible sources of information and overcome the challenges they face to use the databases, bibliographies and also to reference their work.

It is therefore being observed that the value of which the faculty places on the information literacy instructional practice has a life-long impact on the students' appreciation of the role of information literacy in their learning process. It is also believed that faculty, as course designers, should have an understanding that they, have a bigger role to play in the process, as facilitators of student learning, who should see the link of what they are teaching in class and the acquisition of information literacy skills by their students. To this end, faculty should be expected to possess some basic information literacy competencies, which allow them to support classroom instruction, without which, it would not be easy to produce information literate students. This awakening should discourage the general perception that has existed, which gives the misnomer that the students' information literacy development as being a responsibility of the library, the understanding hereof, has a consequence of making many students leave the university, unable to demonstrate the skills required of them, to exploit the library's research potential.

### CONCLUSION

In summing up the paper it can be noted that, to be effective and of relevance, information literacy skills instruction should have a wider objective, beyond the traditional pedagogy and method of instruction that have been offered to students overtime. It has to be noted that to have an impact, information literacy should be conducted as a course that attracts academic grading, as structure and content of the current method was too abstract and lacked detail to make students information literate. This therefore indicates that there is a need to address the system and mode of information literacy instruction, if the students have to master the needed skills. This can be achieved by developing extensive and integrated instructional programmes, through lectures, seminars, workshops, handouts, and possibly, web-based tutorials, either as course related or course-specific information literacy instructional approaches, which have undoubtedly proved to be an effective way to improve library instruction and stimulate the students' learning.

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## The Difference between Male and Female in Internet Usage Case Study (Kabul University)



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**ABSTRACT:** The goal of the study was to see if there was any gender difference in Internet usage among Kabul University students. Respondents (400) were chosen from the student population across faculties using a stratified random sampling procedure. The study employed a descriptive survey research approach. The participants were given a 14-item questionnaire to fill out in order to collect data. The SPSS program was used to examine the data. The majority of the participants (329) had Internet connection, according to the study. The Internet was found to be gender-neutral in terms of accessibility. On news, sport, and social media sites, gender disparities in Internet usage habits were statistically significant.

**KEYWORDS:** Gender equity, Internet usage, Kabul University, Afghanistan.

### 1. INTRODUCTION

Internet technologies are becoming increasingly important in higher education for creating, storing, and disseminating information and knowledge. One of the most significant trends in today's education system, according to (Petrovic & Pavlovic, 2016), is the integration of Internet technology into educational contexts.

E-mail, web browsing, file transfer protocols (FTP), cybersex, and visual interactive games are all prevalent uses of the internet in educational settings (Sayaf et al., 2021). Students use websites that are relevant to their special interests and needs, according to the literature (Horvat et al., 2011). Students utilize the internet for a variety of reasons, according to usage patterns.

The use of the internet has been shown to be gendered (Shanmugam et al., 2013). According to (Odell et al., 2000), the internet has always been dominated by men. Females use the internet less intensively than males, according to a study (Ono & Zavodny, 2002). This study also founded out that more males than females utilized the internet for recreational purposes (playing online games, gambling, accessing news, and seeking information), while females preferred to use the internet to communicate with family and friends (Campos-Castillo, 2015)

According to Show and Grant (2002), male students prefer to use the internet for information gathering and enjoyment, whereas female students prefer to use it for communication. These results support the widely held belief that males prefer to use the Internet for information gathering and enjoyment while women prefer to use it for communication (Show and Grant, 2002). Thomson (2000) discovered a positive association between gender and messaging, with females being more likely than males to use the internet for messaging. The findings of Bimber's (2000) study were intriguing. Male students were found to utilize the Internet for pornography more frequently than female pupils.

The goal of this research was to see how male and female students used the internet in the areas of research, music, health, communication, entertainment, and sports. The study was significant since its findings had the ability to inform stakeholders.

### 2. OBJECTIVES OF STUDY

For this research the following objectives have been formulated:

- To compare the Internet use for Academic purpose by the male and female students of Kabul university.
- Internet Use and Gender Differences at the students of Kabul University.
- To compare the Internet use for recreational purpose by the male and female students of Kabul university.
- To compare the Internet use for communication purpose by the male and female students of Kabul university.
- To compare the Internet use for social networking purpose by the male and female students of Kabul university.

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### 3. BACKGROUND OF STUDY

(Campos-Castillo, 2015) discovered that males had considerably more positive opinions toward computers than females in a survey of college students' attitudes toward technology. They also discovered that, refute these conclusions. They did a similar study and found that gender had no bearing on any of the computing attitude factors tested. With the growth of technology, however, women may be able to absorb technology more readily. Women are also less frequent and intense Internet users. Gender inequality concerns have switched from access to intensity. (CamposCastillo, 2015) conducted a study at the G B Pant University of Agriculture and Technology in Pantnagar to learn about the Internet usage trends of undergraduate students. The study found that the majority of students (85.7 percent) used the Internet, with male students using the Internet in greater numbers than female students. In summary, all of these research found that girls use the Internet less frequently than males.

While most researchers believe that the gender gap in Internet use has shrunk dramatically in the college age group, there are some gender disparities in attitudes about technology, intensity of Internet use, preferred online applications, and cyberspace experience. When men and women become parents, according to (Horvat et al., 2011), gender roles often become more differentiated. Women, for example, give more direct care for children and spend more time with them, resulting in an unequal allocation of home labor and childcare. According to (Horvat et al., 2011), women end up "shouldering" the majority of childcare chores, resulting in time constraints. Women also have an essential role in families, according to (Sayaf et al., 2021), by performing the majority of emotional work in families, such as listening to and consoling children, providing emotional support to parents, and doing things to repair or preserve relationships.

As a result, men and women are affected in a variety of ways by their gender roles. Women, for example, discover that their usage of the Internet at home is limited owing to their gender role. Tasks in child care at home, according to (Sayaf et al., 2021), limit mothers' usage of the Internet more than fathers'. Men and women with children at home spend less time on the phone, reading newspapers, watching television, and even attending cultural events. As a result, previous research has found that women who care for children have very little time for themselves, such as surfing the Internet.

The author intended to learn the perspectives of users from University of Wales colleges, as well as the pattern of use, purpose of use, and challenges encountered by users when using these sources. (Sayaf et al., 2021) researched Internet access, usage, and challenges faced by university students in a study titled "Internet Access and Usage by Students of the University of Botswana." The study's findings demonstrated that while many users were aware of the benefits of the Internet, they lacked the requisite searching abilities to make full use of it. Users used the Internet for entertainment, sports, and news, among other things, as a result of this factor.

(Petrovic & Pavlovic, 2016), did another study titled "Internet and its Use in the Engineering Colleges of Punjab, India: A Case Study." Its goal was to look into how lecturers and students in Punjabi engineering colleges used the Internet. The authors looked at the users' experiences and frequency of Internet use, as well as the time spent, location of use, purpose, resources and services used, problems encountered by users, benefits of the Internet over traditional documents, and its impact on respondents' academic efficiency, among other things. The main issues that users faced were Internet access speed, difficulty in accessing important information, and privacy. The amount of Internet use among the students under research was found to be low, owing to a lack of search strategies for locating information. Along with the recommendations for a sufficient computer lab and a reliable power backup system, the author also suggested that the Internet and computer literacy be integrated into the university's compulsory general studies program. In a research article "Internet Use by Teachers and Students in Engineering Colleges of Punjab, Haryana, and

Himachal Pradesh States of India: An Analysis" (Petrovic & Pavlovic, 2016, examined the Internet use by teachers and students and attempted to find whether the Internet can replace libraries? Survey revealed that 77.5% users felt that the Internet cannot replace library services, whereas 22.5% responded otherwise, because they find it easy to locate information on the Internet than in library.

### 4. METHODOLOGY

The main purpose of this research study is to investigate differentiation in internet usage by Kabul University students. For this study the survey method was preferred most because it is a systematic data collection method that can be used in collecting the original data from a large sample.

The participants for this study were 146 females and 180 males (N = 326) selected from the five faculties of the university. A self-administrated online survey was conducted. The online survey was made with help of google form, and the link with questionnaire was shared with appropriate cover letter to participants. The questionnaire consisted out of 14 questions concerning the internet usage.

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Participants completed a shared questionnaire that assessed internet use, age, faculty, gender, computer literacy/illiteracy, favorite websites and duration of use. The questionnaire was pilot tested with the focus group of 15 students who were not part of the sample of the study. The questionnaire was then tested and re-tested after two weeks to determine its reliability coefficient. It had a high reliability coefficient of 86%. After collection of surveys, the data analysis was done with help of software program SPSS Statistics 24.0.

### 5. FINDING

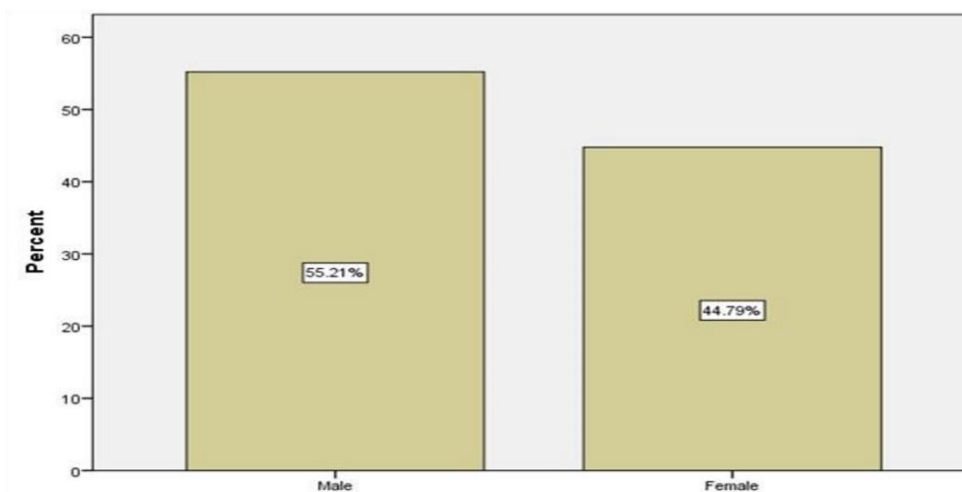
The collected surveys data have been analyzed by SPSS, the obtained result is classified in few factors which is gender difference, time spending using internet, mostly watched website, internet usage for academic purposes.

#### I. Accessibility to the internet by gender:

The following table shows that from 326 valid responses 180 responder are males and 146 responders is female, this difference shows that there is small difference between gender using internet services.

**Table 1. Male and Female Internet usage**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	180	42.8	55.2	55.2
	Female	146	34.7	44.8	100.0
	Total	326	77.4	100	
	Missing questions	74	18.5		
Total		400			



**Figure 1. Male and Female Internet usage charts.**

#### II. Time spending on internet usage

Table 2 shows that most of the students are spending their 45% time using internet, due to the high price and lack of internet connection in Afghanistan this result is still a plus point for our student's usage of internet services.

**Table 2. Time spending on internet usage**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	12	2.9	3.7	3.7
	Often	89	21.1	27.4	31.1
	Sometime	224	53.2	68.9	100.0
	Total	325	77.2	100.0	



## The Difference between Male and Female in Internet Usage Case Study (Kabul University)

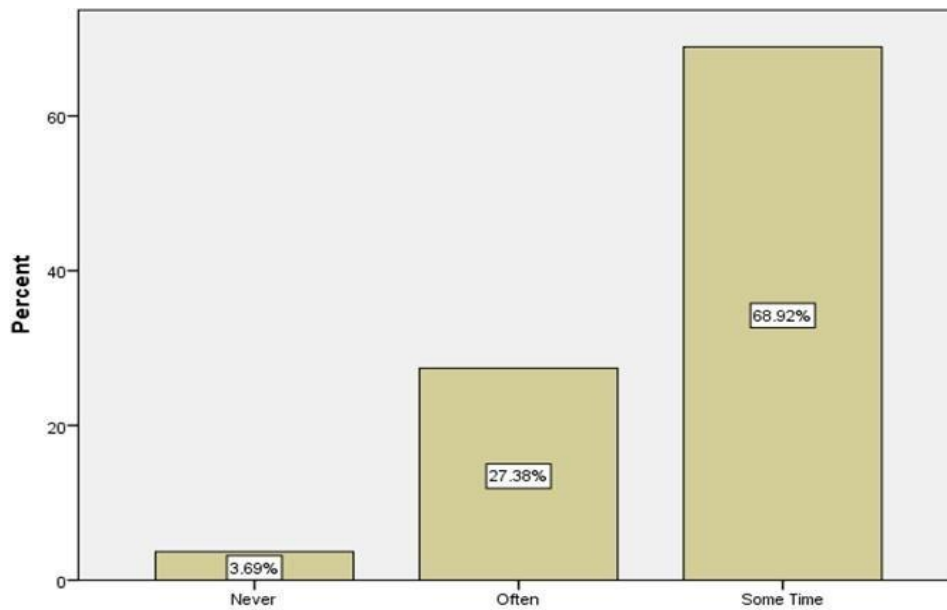


Figure 2. Time spending on internet usage.

### III. Internet usage for academic purposes:

Table 3 shows that most time spending on internet is for academic activities, this means that Kabul university students are interested to gather data and information online through internet instead of manual mode which is no longer useable.

Table 3. Shows internet usage for academic activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	31	7.4	9.6	9.6
	Often	133	31.6	41.2	50.8
	Sometime	159	76.7	49.2	100.0
	Total	323	23.3	100.0	
	Missing questions	77	19.25		
Total		400	100.0		

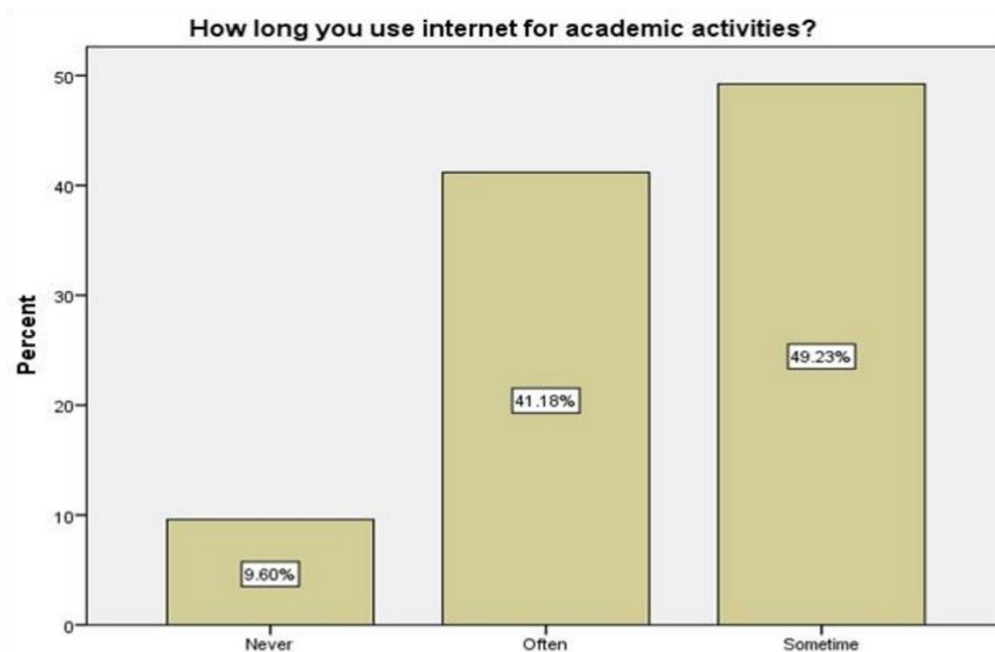


Figure 3. Shows internet usage for academic activities

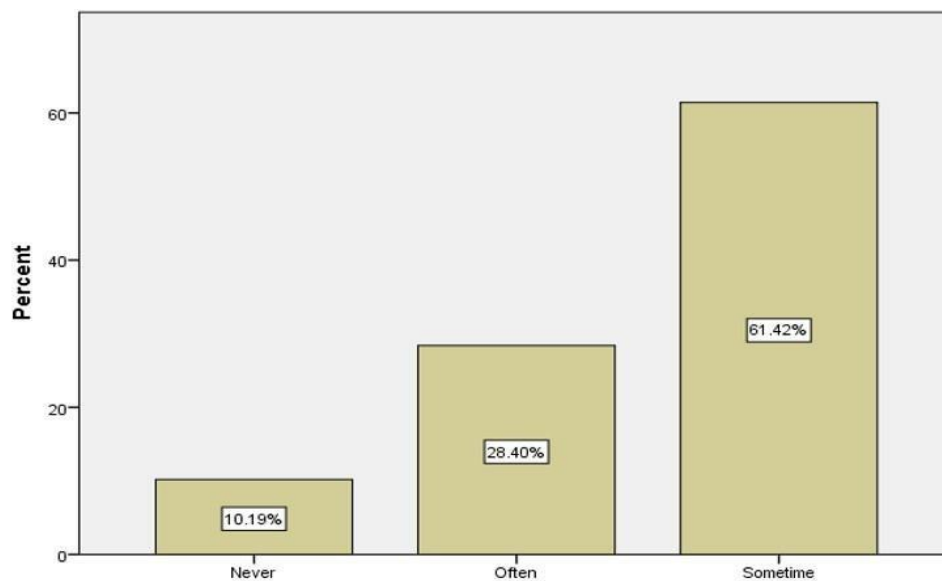
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### IV. Internet usage for visiting social networks

Table 4 shows internet usage for visiting social networks sites such as Facebook twitter, the collected usage percentage show that 28.4 percent of time is spending for visiting social site. It looks that students spending their more time for academic working.

**Table 4. Internet usage for social networks sites**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	33	7.8	10.2	10.2
	Often	92	21.9	28.4	38.6
	Sometime	199	47.3	61.4	100.0
	Total	324	77.0	100.0	
	Missing questions	76	19.0		
Total		400	100.0		



**Figure 4. Show usage of internet for visiting social network sites**

### V. Served students and faculty

The table 5 shows the five faculties that was selected for the primary data, the questioner was distributed online among these faculties. Most of the students were from economics and computer science faculties, slight number of students were from Math faculty.

**Table 5. Shows faculty that was enrolled in this serve**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Computer Science	105	24.9	32.2	32.2
	Economics	118	28.0	36.2	68.4
	Fine Arts	47	11.2	14.4	82.8
	Journalism	40	9.5	12.3	95.1
	Math	16	3.8	4.9	100.0
	Total	326	77.4	100.0	
	Missing questions	74	18.5		
Total		400			

## The Difference between Male and Female in Internet Usage Case Study (Kabul University)

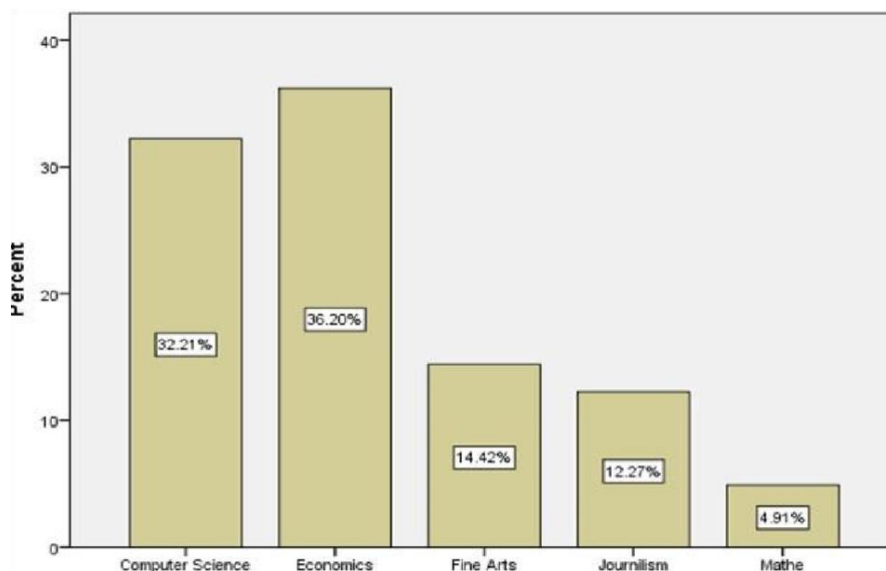


Figure 5. Faculty that was enrolled in this serve

### 6. DISCUSSION

The findings of this study are as follow:

- The aim of the study was to find out if there was gender differentiation in internet usage among university students. It appears from this study that the university has an Internet presence, hence, students with the ability can access the www. The finding that the majority of the students accessed the Internet is therefore not confounding.
- The findings of the study according to the first questions which is accessibility to the internet by gender shows that from 326 valid responses 180 responder are males and 146 responders is female, this difference shows that there is small difference between gender using internet services.
- The findings also discovered in 2th which is about time spending on internet usage that most of the students are spending their 45% time using internet, due to the high price and lack of internet connection in Afghanistan this result is still a plus pint for our student's usage of internet services.
- In the 3th table which is about Internet usage for academic purposes shows that most time spending on internet is for academic activates, this means that Kabul university students are interested to gather data and information online throw internet instead of manual mode which is no longer useable.
- This study also shows in 4<sup>th</sup> table that internet usage for visiting social networks sites such as Facebook twitter, the collected usage percentage show that 28.4 percent of time is spending for visiting social site. It looks that students spending their more time for academic working.
- In the last question which is about served students and faculty the researcher funded out that the five faculties that was selected for the primary data, the questioner was distributed online among these faculties. Most of the students were from economics and computer science faculties, slight number of students were from Math faculty.

### 7. CONCLUSION

The majority of the students accessed the Internet but their interests were as diverse as the number of sites accessed. On a larger scale, there was absence of gender differentiation on most Internet sites except new, sport and pornography. It is relieving that these students are not yet at risk of Internet pornography and gambling.

The study established gender equity and gender differentiation in internet usage but did not identify reasons for sites' preferences. It is recommended to establish why students prefer certain sites to others. The conclusion of this study revealed considerable gender differences in online visits to sports, and new websites. In comparison to their female counterparts, more male students viewed pornographic websites. It also shows that females have a reputation for avoiding dangerous behaviors. Conversely, more male than female students showed some preferences for pornography as it motivates, orchestrates, justifies and guides sexual abuse and violence against women. Male students visited the sport site more frequently than female students. At the other hand the conclusion of this study shows that males were more interested in the news site than females. Given that ladies and males are equally engaged in news, Internet discrepancies between female and male students in terms of news site visits are not

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unfathomable. The lack of a gender gap in Internet use may be due to the fact that the majority of students regard it as an important source of up-to-date and in-depth academic knowledge required for assignments, and as a result, even females with Internet phobia are forced to use it frequently. In addition, some lecturers communicate with students over the internet.

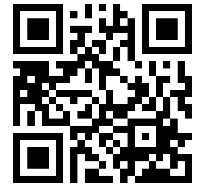
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## Effect of Organizational Climate and Competence on Employee Organizational Commitment with Job Satisfaction as Intervening Variable at Bali Mandara Hospital



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**ABSTRACT :** The purpose of this study was to analyze the effect of organizational climate and competence on job satisfaction and organizational commitment. This research was conducted at Bali Mandara General Hospital. The research population was 222 non-Health employees, and 69 people were taken as samples. Sources of data using primary data in the form of a questionnaire. This study uses a quantitative research approach, with data analysis using Structural Equation Modeling with the SmartPLS 3.0 Program. The results of the study show organizational climate and competence have a significant effect on job satisfaction. Organizational climate and competence have a significant effect on organizational commitment. Competence and job satisfaction have a significant effect on organizational commitment.

**KEYWORDS:** organizational climate, competence, job satisfaction and organizational commitment.

### I. PRELIMINARY

Every organization, whether profit-oriented or not, the human element as a capital factor is a resource that plays a very important role in achieving organizational goals that are efficient and effective. Thus the success or failure of an organization in achieving its goals is largely determined by human resources. Although other factors are also important, such as capital and equipment, in the end, human resources will also act as managers and implementers, so that the goals of the organization can be achieved properly. So the human element is an element that determines the success or failure of activities in a company organization because human resources are leaders, managers and implementers. Without human resources as the driving force,

Humans are an important element, because other elements owned by the organization such as money, material machines, work methods, time and other wealth can only be useful for the organization, if the humans in the organization are used optimally (Hasibuan, 2017). Furthermore, the opinion of Ranupandojo and Husnan (2002) states that although we are now in the technological age where workers have been facilitated and some have even been replaced with machines, humans remain the most important element in determining the organization. Humans are the determining factor towards the achievement of effective organizational goals, so employees or employees who are committed to the organization are needed.

Organizational commitment is an attempt to define and involve oneself in the organization and there is no desire to leave it. The stronger the organizational commitment that employees have in supporting the implementation of their duties and work, the better the performance that will be generated (Robbins, 2016). The commitment of employees to the organization will make employees have loyalty to the organization and work well for the benefit of the organization. This situation is very good for the achievement of employee performance and organizational goals, because the organization has full support from its members so that it can concentrate fully on the goals to be achieved.

Many factors affect employee organizational commitment, one of which is organizational climate. Realizing how the organizational climate has a significant contribution to each individual in the organization, which in the end will also affect performance, the management needs to understand well the growing climate in the organization. Wirawan (2012) organizational climate is one way to measure organizational culture, and organizational climate itself is interpreted as the way employees understand their organizational environment. Conditions like this can finally clarify his opinion that certain factors can be important in certain organizations, but have no meaningful meaning in other organizations. Viewing the organizational climate as a personality of the organization as seen by its members. So a particular organizational climate is the climate that employees in the organization see. Organizational climate broadly is the perception of organizational members (individually and in groups) and those in constant

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contact with the organization (eg suppliers, customers, consultants, and contractors) about what is or is happening in the organization's internal environment on a regular basis, which influences organizational attitudes and behavior.

Based on the opinion above, it can be said that organizational climate has an influence on employee organizational commitment. This opinion is reinforced by the results of research conducted by Purnama and Riana (2020) who found organizational climate to have a positive and significant effect on organizational commitment. The results of the same study were also conducted by Hanafi and Sanosra (2018) who found that organizational climate directly had a significant effect on organizational commitment, but had no significant effect as an intervening variable. However, the results of this study are different from the results of research conducted by Dharma (2019), the results of his research found that organizational climate did not directly affect organizational commitment.

In addition to organizational climate factors, another factor that also affects employee organizational commitment is competence. According to Irham (2014) competence is an ability possessed by an individual who has a selling value and it is applied from the results of creativity and innovation produced. Competence is a basic characteristic of a person that enables them to perform superiorly in their work. Competencies are needed by organizations to support the successful implementation of work, and some organizations set the required competency standards for their employees.

The opinion above is in line with the results of a study conducted by Samtono (2019) which found that competence has a positive effect on organizational commitment. The results of this study are in line with the results of research conducted by Ahyuardi, et al (2018) which found that competence has a significant effect on commitment. However, this research is different from the results of research conducted by Guridno and Sinambela (2019). The results of his research found that competence had no effect on organizational commitment.

In addition to organizational climate and competence, job satisfaction is also an important factor in increasing employee organizational commitment. Job satisfaction refers to the general attitude of an individual towards the work he does. Someone with a high level of job satisfaction shows a positive attitude towards the job, while someone who is dissatisfied with his job shows a negative attitude towards the job (Widiarti and Dewi, 2016).

Kuntjoro, (2019) states that one aspect of organizational commitment is loyalty, member loyalty to the company means someone's willingness to be able to maintain their relationship with the company even at the expense of their personal interests without expecting anything. The desire of members to maintain themselves working in the company is something that can support the commitment of members where they work. This is attempted when members feel a sense of security and satisfaction in their workplace.

The opinion above is in line with the results of research conducted by Purnama and Riana (2020) which found job satisfaction has a positive and significant effect on organizational commitment. Widiarti and Dewi (2016) research results also found job satisfaction has a positive and significant effect on employee organizational commitment. The results of this study are different from the results of research conducted by Iskandar and Surohadikusumo (2020), the results of his research found that there was no significant effect between job satisfaction and organizational commitment.

In order to create employee job satisfaction, many efforts can be made by the company. One of the efforts that a company or organization can do is to create a conducive organizational climate. Organizational climate has an important role in increasing employee organizational commitment. Organizational climate has a positive and significant impact on job satisfaction (Purnama and Riana, 2020). However, research conducted by Arief (2020) found that organizational climate partially did not have a significant positive effect on employee job satisfaction variables.

In addition to a conducive organizational climate, competence also affects employee job satisfaction. Asmalah and Sudarso (2019) found that competence has a positive and significant effect on job satisfaction. Utami and Sukmawati (2018) the results of their research also find the same results, namely job satisfaction is influenced by competence. The results of this study are not in line with the results of research conducted by Rudlia (2016) which found that competence had an insignificant effect on the job satisfaction variable.

This research was conducted at the Bali Mandara Regional General Hospital (RSUD). This General Hospital is a hospital owned by the Bali Provincial government. Based on Law no. 44 of 2009 concerning hospitals, the Government and Local Governments are responsible for providing hospitals based on community needs, according to Law no. 23 of 2014 concerning Regional Government, government affairs must be related to basic services, therefore Bali Mandara Hospital was established to provide services to the wider community based on Pancasila and based on human values, ethics and professionalism, benefits, justice, equality of rights and anti-discrimination, equity, protection and safety of patients and has a social function in society.



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Based on the gap in the results of research conducted by previous researchers and the real conditions at the research site, it is quite relevant to conduct a research entitled: "The Effect of Organizational Climate and Competence on Employee Organizational Commitment with Job Satisfaction as an Intervening Variable at Bali Mandara Hospital".

## **II. LITERATURE REVIEW**

### **Resource based theory (RBT)**

The theory that underlies this research is the theory of Resource Based Theory (RBT). The reason for choosing the RBT theory as the basis for this research is because the RBT theory emphasizes the importance of intangible assets in the company. The intangible asset in the company is human resources. Companies that have superior human resources will have a competitive advantage. One of the superior human resources is employees who have a high commitment to the organization and have competencies in accordance with their fields. This can be realized if employees feel satisfied in their work.

Wernerfelt (1984) explains that according to Resource-Based Theory (RBT) companies will excel in business competition and obtain good financial performance by owning, controlling and utilizing important strategic assets (tangible and intangible assets). Belkaoui (2003) states that a potential strategy to improve company performance is to combine tangible assets and intangible assets. Resource-Based Theory (RBT) is a thought that developed in the theory of strategic management and competitive advantage of companies that believe that companies will achieve excellence if they have superior resources.

Pulic (1998) argues that the main goal of a knowledge-based economy is to create added value. To be able to create this added value, it is necessary to have the right measure of physical capital in the form of financial funds and intellectual potential represented by employees with all the potential and abilities attached to them. Based on the Resource-Based Theory (RBT) approach, it can be concluded that the resources owned by the company affect the company's performance which in turn will increase the value of the company.

### **HYPOTHESIS**

Today, the need for skilled workers in various fields has become a global demand that cannot be denied anymore. Therefore, we should realize that we are required to have the ability to make quality human resource development plans. For this purpose, management should be able to make internal improvements, one of which is through the development of human resources. This improvement in internal conditions can also aim to strengthen oneself and increase resilience in the face of increasingly fierce local and global competition. This means that the company must improve the performance of its company through improving its human resources, so that the company has employees with a high commitment to the company.

An employee or employee will not be able to work well if he does not have the commitment to do the job, even though the work can be done, usually does not produce satisfactory results. Therefore, in increasing employee organizational commitment, it is very important to provide knowledge of the field of work of the workers concerned, in addition to understanding other factors that affect employee organizational commitment.

Many factors affect employee organizational commitment, one of which is organizational climate. Research conducted by Purnama and Riana (2020) found that organizational climate had a positive and significant effect on organizational commitment. In addition to the organizational climate factor, another factor that also affects employee organizational commitment is the competence of Samtono (2019) who found that competence has a positive effect on organizational commitment.

In addition to organizational climate and competence, job satisfaction is also an important factor in increasing employee organizational commitment. Job satisfaction refers to the general attitude of an individual towards the work he does. Someone with a high level of job satisfaction shows a positive attitude towards the job, while someone who is dissatisfied with his job shows a negative attitude towards the job (2016). Purnama and Riana (2020) who found job satisfaction had a positive and significant effect on organizational commitment. Widiarti and Dewi (2016) research results also found job satisfaction has a positive and significant effect on employee organizational commitment.

In order to create employee job satisfaction, many efforts can be made by the company. One of the efforts that a company or organization can do is to create a conducive organizational climate. Organizational climate has an important role in increasing employee organizational commitment. Organizational climate has a positive and significant impact on job satisfaction (Purnama and Riana, 2020). In addition to a conducive organizational climate, competence also affects employee job satisfaction. Asmalah and Sudarso (2019) found that job satisfaction has a positive and significant effect on job satisfaction. Utami and Sukmawati (2018) the results of their research also find the same results, namely job satisfaction is influenced by competence.

H1: Organizational climate has a positive and significant effect on job satisfaction of employees at the Bali Mandara Hospital.

H2: Competence has a positive and significant effect on job satisfaction of employees at the Bali Mandara Hospital.

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H3: Organizational climate has a positive and significant effect on the organizational commitment of the employees of the Bali Mandara Hospital.

H4: Competence has a positive and significant effect on the organizational commitment of the employees of the Bali Mandara Hospital.

H5: Job satisfaction has a positive and significant effect on the organizational commitment of the employees of the Bali Mandara Hospital.

### **III. RESEARCH METHODS**

#### **Research sites**

The research location is a place or object for conducting a research. This research was conducted at the Bali Mandara Regional General Hospital (RSUD). Researchers took the research location because based on findings in the field the problems that existed at the Bali Mandara Regional General Hospital (RSUD) were that the commitment of non-health employees was not optimal.

This research was conducted for a period of 6 months, namely October 2021 to July 2022. This research process starts from the initial data collection at the research location to find phenomena in the research variables. After finding the phenomenon through empirical data, the next step is to submit a title. The title that has been approved is then carried out with proposal guidance, thesis guidance and thesis examination.

#### **Population and Sample**

The population in this study were non-health employees at the Bali Mandara Hospital as many as 222 people. The number of research samples was determined by the Slovin method from a number of research populations. Then the total population (N) = 222 people, and a significance level of 10%, the number of samples in this study was 69 people.

#### **Identification of Research Variables**

The variables used in this study are:

- 1) The dependent variable is Employee Organizational Commitment (Y2), namely: Employee Organizational Commitment (Y2) is a situation in which an individual sided with the organization and its goals and desires to maintain membership in the organization (Robbins & Judge, 2017).
- 2) Job Satisfaction Intervening Variables (Y1), namely: Job Satisfaction (Y1) as an attitude that reflects a person's positive and negative feelings about work, colleagues, and the work environment. A person who feels satisfied with the work given to him will have a positive view of his organization and vice versa (Uhl-Bien et al., 2014).
- 3) Independent variables (X), among others: a) Organizational Climate (X1). Organizational climate (X) is a condition regarding the characteristics that occur in the work environment that are considered to affect the behavior of people in the organizational environment. Therefore, the organizational climate can be said to be the scope of the organization (Hudiyamin, et al, 2016). b) Competence (X2) Competence (X2) is a combination of knowledge, skills, attitudes and other personal characteristics needed to achieve success in a job, which can be measured using agreed standards and which can be improved through training and development (Marwansyah, 2007). 2014).

#### **Data analysis**

Data were analyzed using Partial Least Squares (PLS) which is an indeterminacy factor for a powerful analytical method because it does not assume the data must be measured at a certain scale, the number of samples is small. PLS can also be used for theory confirmation. Compared to covariance based SEM (represented by LISREL, EQS or AMOS software), component based PLS is able to avoid two major problems faced by covariance based SEM (CBSEM) namely inadmissible solutions (Fornell and Bookstein, 1982).

### **IV. RESEARCH RESULTS AND DISCUSSION**

Results

#### **1. Hypothesis test**

The results of hypothesis testing through a table of direct influence between the independent variable to the mediating variable and the dependent variable, as follows.

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**Table 1. Hypothesis Testing Results**

Relationship Between Variables	Path Coefficient (Bootstrapping)	T-Statistics	Sig	Conclusion
Organizational climate (X1) → Job satisfaction (Y1)	0.597	5.162	0.000	H1 Accepted
Competence (X2) → Job satisfaction (Y1)	0.283	2,420	0.016	H2 Accepted
Organizational climate (X1) → Organizational commitment (Y2)	0.276	2,280	0.023	H3 Accepted
Competence (X2) → Organizational commitment (Y2)	0.293	3.083	0.002	H4 Accepted
Job satisfaction (Y1) → Organizational commitment (Y2)	0.414	3,221	0.001	H5 Accepted

Source: Data processed 2022

The results of testing the research hypothesis based on Table 1 are as follows:

- 1) Hypothesis Testing 1: Organizational climate has a positive and significant effect on job satisfaction of employees at the Bali Mandara Hospital. These results can be seen in the coefficient value of 0.597 with a t-statistics value of 5.162. The t-statistics value is above 1.96 and the sig value is 0.000 < 0.05. Based on this, hypothesis 1 is declared accepted. The acceptance of the first hypothesis which states that organizational climate has a positive and significant effect on job satisfaction means that the better the organizational climate in the organization Bali Mandara Hospital, the higher the job satisfaction of employees.
- 2) Hypothesis Testing 2: Competence has a positive and significant effect on job satisfaction of employees at the Bali Mandara Hospital. These results can be seen in the coefficient value of 0.283 with a t-statistics value of 2,420. The t-statistics value is above 1.96 and the sig value is 0.016 < 0.05. Based on this, hypothesis 2 is declared accepted. The acceptance of the second hypothesis which states that competence has a positive and significant effect on job satisfaction means that the higher the competence of employees, the higher the job satisfaction of employees.
- 3) Hypothesis Testing 3: Organizational climate has a positive and significant effect on the organizational commitment of the employees of the Bali Mandara Hospital. These results can be seen in the coefficient value of 0.276 with a t-statistics value of 2.280. The t-statistics value is above the critical value of 1.96 and the sig value of 0.023 < 0.05. Based on this, hypothesis 3 is declared accepted. The acceptance of the third hypothesis which states that organizational climate has a positive and significant effect on organizational commitment means that the better the organizational climate in the Bali Mandara Hospital, the higher the employee's commitment to the organization.
- 4) Hypothesis Testing 4: Competence has a positive and significant effect on the organizational commitment of the employees of the Bali Mandara Hospital. These results can be seen in the coefficient value of 0.293 with a t-statistics value of 3.083. The t-statistics value is above the critical value of 1.96 and the sig value of 0.002 < 0.05. Based on this, hypothesis 4 is declared accepted. The acceptance of the fourth hypothesis which states that competence has a positive and significant effect on organizational commitment means that the higher the competence of employees Bali Mandara Hospital, the higher the employee's commitment to the organization.
- 5) Hypothesis Testing 5: Job satisfaction has a positive and significant effect on the organizational commitment of the employees of the Bali Mandara Hospital. These results can be seen in the coefficient value of 0.414 with a t-statistics value of 3.221. The t-statistics value is above 1.96 and the sig value is 0.001 < 0.05. Based on this, hypothesis 5 is declared accepted. The acceptance of the fifth hypothesis which states that job satisfaction has a positive and significant effect on organizational commitment means that the higher the job satisfaction of employees Bali Mandara Hospital, the higher the employee's commitment to the organization.

## 2. Testing Indirect Effects through Mediation Variables

**Table 2. Recapitulation of Testing Results of Mediation Variables Job Satisfaction**

Mediation of Job Satisfaction Variable (Y1) on:	Effect				Note:
	(a)	(b)	(c)	(d)	
Organizational climate (X1) → Organizational commitment (Y2)	0.406 (Sig)	0.530 (Sig)	0.597 (Sig)	0.414 (Sig)	<i>Partial Mediation</i>
Competence (X2) → Organizational commitment (Y2)	0.293 (Sig)	0.406 (Sig)	0.283 (Sig)	0.414 (Sig)	<i>Partial Mediation</i>

Source: Data processed, 2022

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The information obtained from Table 2 above is the result of testing the mediating variables that can be conveyed as follows:

- 1) Job satisfaction (Y1) is able to mediate positively and significantly on the indirect effect of organizational climate (X1) on organizational commitment (Y2). This result is shown from the mediation test carried out, it appears that the effects of a, c and d have significant values. Job satisfaction variable as a mediator between organizational climate and organizational commitment. Job satisfaction has a partial mediating effect on the influence of organizational climate on organizational commitment. This means that job satisfaction is not the only force that has an impact on organizational commitment.
- 2) Job satisfaction (Y1) is able to mediate positively and significantly on the indirect effect of competence (X2) on organizational commitment (Y2). This result is shown from the mediation test carried out, it appears that the effects of a, b and c have significant values. Job satisfaction variable as a mediator between competence and organizational commitment. Job satisfaction has a partial mediating effect on the effect of competence on organizational commitment. This means that job satisfaction is not the only force that has an impact on organizational commitment.

The following is a recapitulation of direct effects, indirect effects and total effects as shown in the following table.

**Table 3. Recapitulation of Direct, Indirect, and Total Effects**

No	Variable Relationship	Live Effect	Indirect Effect	Total Effect
1	Organizational climate (X1) → Job satisfaction (Y1)	0.597	-	0.597
2	Competence (X2) → Job satisfaction (Y1)	0.283	-	0.283
3	Organizational climate (X1) → Organizational commitment (Y2)	0.276	-	0.276
4	Organizational climate (X1) → Job satisfaction (Y1) → Organizational commitment (Y2)	0.276	$(0.597 * 0.414) = 0.247$	0.523
5	Competence (X2) → Organizational commitment (Y2)	0.293	-	0.293
6	Competence (X2) → Job satisfaction (Y1) → Organizational commitment (Y2)	0.293	$(0.283 * 0.414) = 0.117$	0.410
7	Job satisfaction (Y1) → Organizational commitment (Y2)	0.414	-	0.414

Source: Data processed, 2022

The data in Table 3 above shows that the indirect effect of organizational climate on organizational commitment through job satisfaction has the highest total effect, which is 0.523. While the direct influence of organizational climate variable has the highest influence on job satisfaction, which is equal to 0.597. The finding from this analysis is that organizational commitment will be higher if the organizational climate is accompanied by high job satisfaction.

## V. DISCUSSION

### 1. The influence of organizational climate on job satisfaction

The results of hypothesis testing indicate that organizational climate has a positive and significant effect on job satisfaction. These results mean that the better the organizational climate in the Bali Mandara Hospital, the higher the job satisfaction of employees. This means that the regulations or SOPs owned by the Bali Mandara Hospital will be able to reflect work towards improving employee performance. Employee knowledge about the implementation of rules and SOPs is due to employees having a high level of education. Based on the characteristics of the respondents, most of the employees of the Bali Mandara Hospital have education levels at the tertiary level, namely diploma, undergraduate and postgraduate.

The most dominant organizational climate in increasing job satisfaction is that employees feel that the work standards of the Bali Mandara Hospital are able to measure feelings of pressure to do a good job and employees feel that performance measurement can reflect work that leads to increased performance. This means that the organizational climate, especially regarding the rules or work standards in the Bali Mandar Hospital, is able to make the work climate conducive, which in turn will increase job satisfaction.

The results of this study are in line with the results of this study in line with the results of research conducted by Purnama and Riana (2020) which found organizational climate to have a positive and significant effect on job satisfaction. These results are in line with the results of research conducted by Widiarti and Dewi (2016) who found organizational climate to have a positive and significant effect on job satisfaction.

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## **2. The influence of competence on job satisfaction**

The results of hypothesis testing indicate that competence has a positive and significant effect on job satisfaction. This result means that the better the employee's competence Bali Mandara Hospital, then the employee's job satisfaction will be higher. This means that competencies that have a responsive and diligent attitude in carrying out work affect organizational commitment. Bali Mandara Hospital has employees with good competence, this is because most of the employees of Bali Mandara Hospital have a high level of education, namely college level.

In addition to a high level of education, the work experience of employees is also quite long, which is mostly over 3 years. With a long level of education and work experience, the competence of employees will be better. Thus, employees will have knowledge about their respective duties so that they are able to complete their duties in accordance with the targets set by the organization. In addition, with a long work experience coupled with a high level of education, employees will be able to work together with colleagues to complete work together in order to achieve organizational goals.

The results of this study are in line with the results of research conducted by Asmah and Sudarso (2019) which found that competence has a positive and significant effect on job satisfaction. Likewise with the results of research conducted by Utami and Sukmawati (2018) which found that job satisfaction is influenced by competence.

## **3. The influence of organizational climate on organizational commitment**

The results of hypothesis testing indicate that organizational climate has a positive and significant effect on organizational commitment. These results mean that the better the organizational climate in the Bali Mandara Hospital, the higher the employee's commitment to the organization. This means that the regulations or SOPs owned by the Bali Mandara Hospital will be able to reflect work towards improving employee performance. Employee knowledge about the implementation of rules and SOPs is due to employees having a high level of education. Based on the characteristics of the respondents, most of the employees of the Bali Mandara Hospital have education levels at the tertiary level, namely diploma, undergraduate and postgraduate.

The most dominant organizational climate in increasing organizational commitment is that employees feel that the work standards of the Bali Mandara Hospital are able to measure feelings of pressure to do a good job and employees feel that performance measurement can reflect work that leads to increased performance. This means that the organizational climate, especially regarding the rules or standards of work in the Bali Mandara Hospital, is able to make the work climate conducive, which in turn will increase organizational commitment. With a high commitment, employees will have a high morale as well.

The results of this study are in line with the results of research conducted by Purnama and Riana (2020) which found organizational climate to have a positive and significant effect on organizational commitment. The results of the same study were also conducted by Hanafi and Sanosra (2018) who found that organizational climate directly had a significant effect on organizational commitment, but had no significant effect as an intervening variable.

## **4. The influence of competence on organizational commitment**

The results of hypothesis testing indicate that competence has a positive and significant effect on organizational commitment. These results mean that the higher the competence of employees, Bali Mandara Hospital, the higher the employee's commitment to the organization. This means that competencies that have a responsive and diligent attitude in carrying out work affect organizational commitment. Bali Mandara Hospital has employees with good competence, this is because most of the employees of Bali Mandara Hospital have a high level of education, namely college level.

In addition to a high level of education, the work experience of employees is also quite long, which is mostly over 3 years. With a long level of education and work experience, the competence of employees will be better. Thus, employees will have knowledge about their respective duties so that they are able to complete their duties in accordance with the targets set by the organization. In addition, with a long work experience coupled with a high level of education, employees will be able to work together with colleagues to complete work together in order to achieve organizational goals.

The results of this study are in line with Irham (2014) competence is an ability possessed by an individual who has a selling value and it is applied from the results of creativity and innovation produced. Competence is a basic characteristic of a person that enables them to perform superiorly in their work. Competencies are needed by organizations to support the successful implementation of work, and some organizations set the required competency standards for their employees. The opinion above is in line with the results of a study conducted by Samtono (2019) which found that competence has a positive effect on organizational commitment. The results of this study are in line with the results of research conducted by Ahyanuardi,

## **5. The effect of job satisfaction on organizational commitment**

The results of hypothesis testing indicate that job satisfaction has a positive and significant effect on organizational

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commitment. These results mean that the higher the employee's job satisfaction, the higher the employee's commitment to the organization. Employees who have high job satisfaction, such as satisfaction about the opportunity to increase their abilities, satisfaction with wages or salaries provided by the organization, satisfaction with promotions, supervision, good working relationships and a conducive working atmosphere will have an impact on high employee commitment to the organization. .

The most dominant job satisfaction indicator in increasing organizational commitment is employee satisfaction with the work atmosphere and conducive working conditions. One of the reasons for the conducive working atmosphere at Bali Mandara Hospital is the organization's members who have high knowledge, so they can think rationally. In addition, the working relationship between fellow employees is also well established, because most employees have a working period of more than 3 years, so they already have a good relationship.

The results of this study are in line with the opinion of Kuntjoro, (2019) which states that one aspect of organizational commitment is loyalty, member loyalty to the company means a person's willingness to be able to maintain his relationship with the company even at the expense of his personal interests without expecting anything. The desire of members to maintain themselves working in the company is something that can support the commitment of members where they work. This is attempted when members feel a sense of security and satisfaction in their workplace. The opinion above is in line with the results of research conducted by Purnama and Riana (2020) which found job satisfaction has a positive and significant effect on organizational commitment...

### VI. CONCLUSION

Based on the discussion of the research results, it can be concluded that the influence of organizational climate and competence on organizational commitment through job satisfaction is as follows:

1. Organizational climate has a positive and significant influence on job satisfaction. This means that the better the organizational climate in Bali Mandara Hospital, the higher the job satisfaction of employees.
2. Competence has a positive and significant effect on job satisfaction. This means higher employee competence Bali Mandara Hospital, the higher the job satisfaction of employees.
3. Organizational climate has a positive and significant influence on organizational commitment. This means that the better the organizational climate in the Bali Mandara Hospital, the higher the employee's commitment to the organization.
4. Competence has a positive and significant influence on organizational commitment. This means the higher the competence of employees Bali Mandara Hospital, the higher the employee's commitment to the organization.
5. Job satisfaction has a positive and significant effect on organizational commitment. This means the higher the employee job satisfaction Bali Mandara Hospital, the higher the commitment to the organization.
6. Job satisfaction has a partial mediating effect on the influence of organizational climate on organizational commitment. This means that job satisfaction is not the only force that has an impact on organizational commitment.
7. Job satisfaction has a partial mediating effect on the effect of competence on organizational commitment. This means that job satisfaction is not the only force that has an impact on organizational commitment

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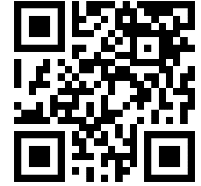
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## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania



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Management Information Services Inc.

**ABSTRACT:** This paper estimates and forecasts the green economies and green jobs in the USA states of Colorado and Pennsylvania. The industry distribution of green jobs in each state is estimated by NAICS code. The occupational distribution of green jobs in each state is estimated by detailed occupational classification and skill levels. Green jobs for each state are forecast for the coming decade. We find substantial differences in the size, structure, distribution, and forecasts of green jobs in each state. We determine that the number of future green jobs in a state is determined by the increasing portion of total jobs in the state comprised of green jobs and the rate of growth of employment in the state, and that green jobs in Colorado are forecast to increase much more rapidly than in Pennsylvania in both percentage and absolute terms. We determine that these changes will alter the future distribution of U.S. green jobs among the states. We also find that the distribution of green jobs among industry sectors in the two states differs significantly. Finally, we find that there are substantial differences in the industrial and occupational distributions of green jobs in Colorado and Pennsylvania. We discuss the implications for Colorado, Pennsylvania, and other states seeking to implement ambitious green initiatives.

**KEYWORDS:** Green jobs; green economies; state green economies; state green jobs, green jobs forecast; green occupations; state green jobs strategies.

### INTRODUCTION

Many states in the USA are aggressively implementing green industry and jobs initiatives to strengthen their economies and labor markets.<sup>1</sup> However, these initiatives are often misguided in that they fail to recognize the size, structure, and potential of the green industries and jobs in the states.

Here we address this issue by analyzing and forecasting the green economies and the jobs created by the green economies in the states of Colorado and Pennsylvania.<sup>2</sup> The two states represent excellent case studies: Colorado is a western state that is growing rapidly, whereas Pennsylvania is an eastern “rustbelt” state that is growing very slowly and has a labor force that is not expanding.

We estimate the size and industrial composition of the states’ green economies, analyze and forecast the jobs and occupations in each state created by the green economies, compare and contrast the green economies and jobs in the two states, and derive the implications for these two states and for other states seeking to increase their green economies and green jobs.

### I. SUMMARY OF THE GREEN INDUSTRY AND JOBS IN COLORADO

We estimate that in 2019:<sup>3</sup>

- Sales generated by green industries in Colorado totaled \$29.4 billion.
- The number of jobs (direct, indirect, and induced) generated in the state by the green economy totaled over 266,000.<sup>4</sup>
- The green economy in Colorado comprised 7.5% percent of gross state product.
- The Colorado green economy accounted for 4.5% of the U.S. green economy.
- Jobs generated by the green economy comprised 8.9 percent of Colorado employment.
- Jobs generated by the green economy in Colorado comprised 3.3 percent of the total number of green jobs in the U.S.

We forecast that, post COVID-19, green jobs will increase four to five times more rapidly than total employment in the state.

#### I.A. Industrial Distribution of Green Jobs

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

Table I-1 shows the industrial distribution of green jobs in Colorado in 2019 by NAICS code.<sup>5</sup>

Comparison of the industrial sector distribution of green jobs in Colorado with that of total employment in the state is instructive – Figure I-1. A significant portion of the green jobs is in the public administration sector which, given the public nature of green programs, is to be expected. However, most of the green jobs in Colorado are in the private sector, and focusing on these reveals that they are heavily concentrated in several sectors. Of particular note is that the private sector green industry in Colorado is more manufacturing intensive than other private sector activity in the state:

- Over 10 percent of private sector jobs in the green industry are in manufacturing, compared to less than five percent in manufacturing among all private sector industrial activities in Colorado.
- Over 17 percent of private sector green jobs are in professional, scientific, and technical services, compared to 14.7 percent of all private sector jobs in the state.
- Nearly 12 percent of private sector green jobs are in administrative, support, and waste management services, compared to less than four percent of all private sector jobs in the state.
- Over 11 percent of private sector green jobs are in construction, compared to less than six percent of all private sector jobs in the state.

Conversely, there are relatively few green jobs in other parts of the Colorado economy (Figure I-1):

- Less than four percent of green jobs are in the retail trade sector, compared to over five percent in retail trade among all jobs in the state.
- Less than one percent of green jobs are in the finance and insurance sector, compared to nearly six percent among all private sector jobs in the state.
- Less than one percent of green jobs are in the health care and social service sector, compared to over nine percent among all jobs in the state.
- Less than two percent of green jobs are in the transportation and warehousing sector, compared to over four percent among all jobs in the state.

**Table I-1 Green Jobs in Colorado in 2019, by Industry**

Industry	2017 NAICS Code	Green Jobs
Agriculture, Forestry, Fishing and Hunting	11	2,004
Mining	21	5,122
Utilities	22	6,607
Construction	23	29,860
Manufacturing	31-33	26,772
Wholesale Trade	42	7,227
Retail Trade	44-45	9,148
Transportation and Warehousing	48-49	4,166
Information	51	1,557
Finance and Insurance	52	1,895
Real Estate and Rental and Leasing	53	2,532
Professional, Scientific, and Technical Services	54	46,372
Management of Companies and Enterprises	55	2,189
Administrative/Support/Waste Management/ Remediation Services	56	31,754
Educational Services	61	2,133
Health Care and Social Assistance	62	624
Arts, Entertainment, and Recreation	71	2,507
Accommodation and Food Services	72	3,122

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

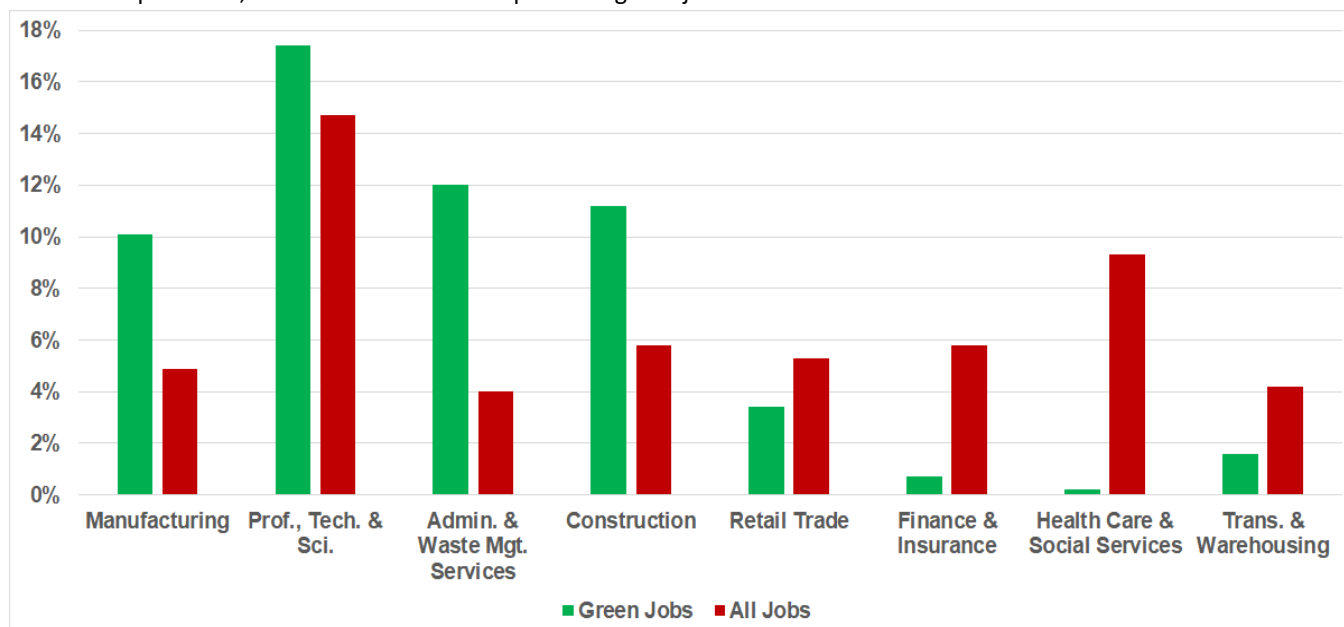
Other Services	81	39,174
Public Administration	92	41,555
<b>State Total</b>		<b>266,321</b>

Source: U.S. Bureau of Labor Statistics, Colorado Department of

Employment and Labor, and Management Information Services, Inc.

Assessing the portion of total state employment in each industrial sector accounted for by green jobs indicates that the 266,300 green jobs accounted for nearly nine percent of the total 3.08 million jobs in Colorado in 2019. However, this distribution is uneven among industry sectors:

- Over 40 percent of employment in the utilities sector consists of green jobs, primarily water, waste treatment, sanitation, and related facilities.
- Nearly 10 percent of public administration employment (federal, state, and local) in the state consists of green jobs.
- Over 17 percent of Colorado jobs in the professional, scientific, and technical services are green jobs.
- Over 10 percent of the state’s manufacturing employment is green-related
- Only very small portions of total state employment in sectors such as food services, entertainment, real estate, transportation, and retail trade are comprised of green jobs.



**Figure I-1 Comparison of the Industrial Distribution of Jobs in Colorado**

Source: U.S. Bureau of Labor Statistics, Colorado Department of Employment and Labor, and Management Information Services, Inc.

The concentration of green jobs within certain industrial sectors is instructive and interesting. While accounting for nearly five percent of total state employment, the industrial sector composition of green employment is highly skewed in favor of certain sectors. For example, more than 10 percent of private sector green jobs are in manufacturing, compared to less than five percent of all employment, and more than 17 percent of green jobs are in professional, scientific, and technical services, compared to less than 15 percent of all private sector jobs in the state.

This indicates that green investments will provide a greater than proportionate assist to Colorado’s high-tech and manufacturing sectors. Colorado is seeking to modernize and expand its high-tech industrial and manufacturing base. Table I-1 and Figure I-1 indicate that the green industry can aid in this objective.

Similarly, green investments generate disproportionately more jobs in professional, scientific, and technical services as the state average. Jobs in this sector are the high-skilled, high-wage, technical and professional jobs that Colorado – and other states – seeks to attract and retain. Table I-1 and Figure I-1 indicate that investments in green protection can be of considerable assistance here.

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

### I.B. Green Jobs in Colorado by Occupation and Skill

Green jobs in Colorado can be disaggregated by specific occupations and skills, and this information for 2019 for selected occupations is given in Table I-2. This table illustrates that green jobs in Colorado are widely distributed among all occupations and skill levels and, while the number of jobs created in different occupations varies substantially, employment in virtually all occupations is generated by the green economy.

**Table I-2 Green Jobs Generated in Colorado in 2019, by Selected Occupations**

Occupation	Jobs
Accountants and Auditors	2,881
Biochemists and Biophysicists	279
Biological Technicians	421
Bookkeeping, Accounting, and Auditing Clerks	2,930
Budget Analysts	158
Chemists	321
Computer Programmers	551
Computer Systems Analysts	1,170
Cost Estimators	641
Electrical and Electronic Engineering Technicians	268
Database Administrators	443
Electricians	1,662
Environmental Engineering Technicians	244
Environmental Engineers	872
Environmental Scientists and Specialists, Including Health	1,218
Executive Secretaries and Administrative Assistants	997
Financial Managers	972
Geoscientists, Except Hydrologists and Geographers	318
Hazardous Materials Removal Workers	649
Health and Safety Engineers	142
Human Resources Specialists	1,450
Industrial Machinery Mechanics	575
Inspectors, Testers, Sorters, Samplers, and Weighers	640
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,989
Landscape Architects	388
Machinists	591
Management Analysts	1,222
Mechanical Engineers	872
Office Clerks	3,480
Plumber, Pipefitters, and Steamfitters	1,011
Refuse and Recyclable Material Collectors	1,909
Security Guards	1,287
Septic Tank Services and Sewer Pipe Cleaners	403
Solar Photovoltaic Installers	160
Truck Drivers, Heavy and Tractor Trailer	2,101
Water and Liquid Waste Treatment Operators	1,741
Welders, Cutters, Solders, and Brazers	104
Wind Turbine Technicians	260

**Source:** Management Information Services, Inc.

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

The vast majority of the green jobs created are standard jobs for accountants, engineers, computer analysts, clerks, factory workers, truck drivers, mechanics, etc. and most of the persons employed in these jobs may not even realize that they owe their livelihood to the green economy.<sup>6</sup> This is borne out in Table I-2 and Figure I-2, which list the jobs created by environmental protection in Colorado in 2019 within selected occupations. These show that in 2019 green industries in Colorado generated:

- More jobs for financial manager (972) than for biochemists (279)
- More jobs for office clerks (3,480) than for environmental engineers (872)
- More jobs for executive secretaries and administrative assistants (997) than for hazardous materials removal workers (649)
- More jobs for bookkeeping and accounting clerks (2,930) than for environmental scientists and specialists (1,218)
- More jobs for machinists (591) than for health and safety engineers (142)
- More jobs for janitors (2,989) than for wind turbine technicians (260)
- More jobs for cost estimators (641) than for landscape architects (388)
- More jobs for management analysts (641) than for environmental engineering technicians (268)
- More jobs for inspectors and testers (640) than for chemists (321)
- More jobs for human resources specialists (1,450) than for solar photovoltaic installers (160)

Thus, many workers in Colorado are dependent on the green economy for their employment, although they often would have no way of recognizing that connection unless it is brought to their attention.<sup>7</sup>

The importance of green industries for jobs in some occupations is much greater than in others. For some occupations, such as environmental scientists and specialists, environmental engineers, hazardous materials workers, water and liquid waste treatment plant operators, environmental science protection technicians, wind turbine technicians, refuse and recyclable material collectors, and environmental engineering technicians, much of the demand in Colorado is created by green activities. This is hardly surprising, for most of these jobs are clearly identifiable as “green” jobs.

However, in many occupations not traditionally identified as green, a greater than proportionate share of the jobs are also generated by the green economy. Recalling that, on average, environment-related employment in Colorado comprises only about nine percent of total employment, in 2019 green expenditures generated jobs for a greater than proportionate share of many professional occupations in the state, including:

- Computer software applications engineers
- Electrical and electronics engineers
- Computer programmers
- Landscape architects
- Operations research analysts
- Biochemists and biophysicists
- Computer systems software engineers
- Network systems and data communications analysts
- Medical scientists (except epidemiologists)
- Chemical engineers
- Management analysts
- Civil engineers
- Chemical technicians
- Architecture and civil drafters
- Electrical and electronics engineering technicians
- Chemical plant and system operators
- Chemical technicians
- Mechanical engineering technicians
- Technical writers
- Electrical and electronics drafters
- Electrical and electronics repairers (powerhouse, substation and relay)
- Chemical plant and system operators
- Surveying and mapping technicians



## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

- Operating engineers

The above findings are significant for they indicate that state investments in green initiatives and environmental protection will create jobs in greater than proportionate shares in two categories Colorado -- and other states -- are eager to attract:

- College-educated professional workers, many with advanced degrees
- Highly skilled, technical workers, with advanced training and technical expertise, many of them in the manufacturing sector.

Green industries thus generate jobs that are disproportionately for highly skilled, well paid, technical and professional workers, who in turn underpin and provide foundation for entrepreneurship and economic growth.

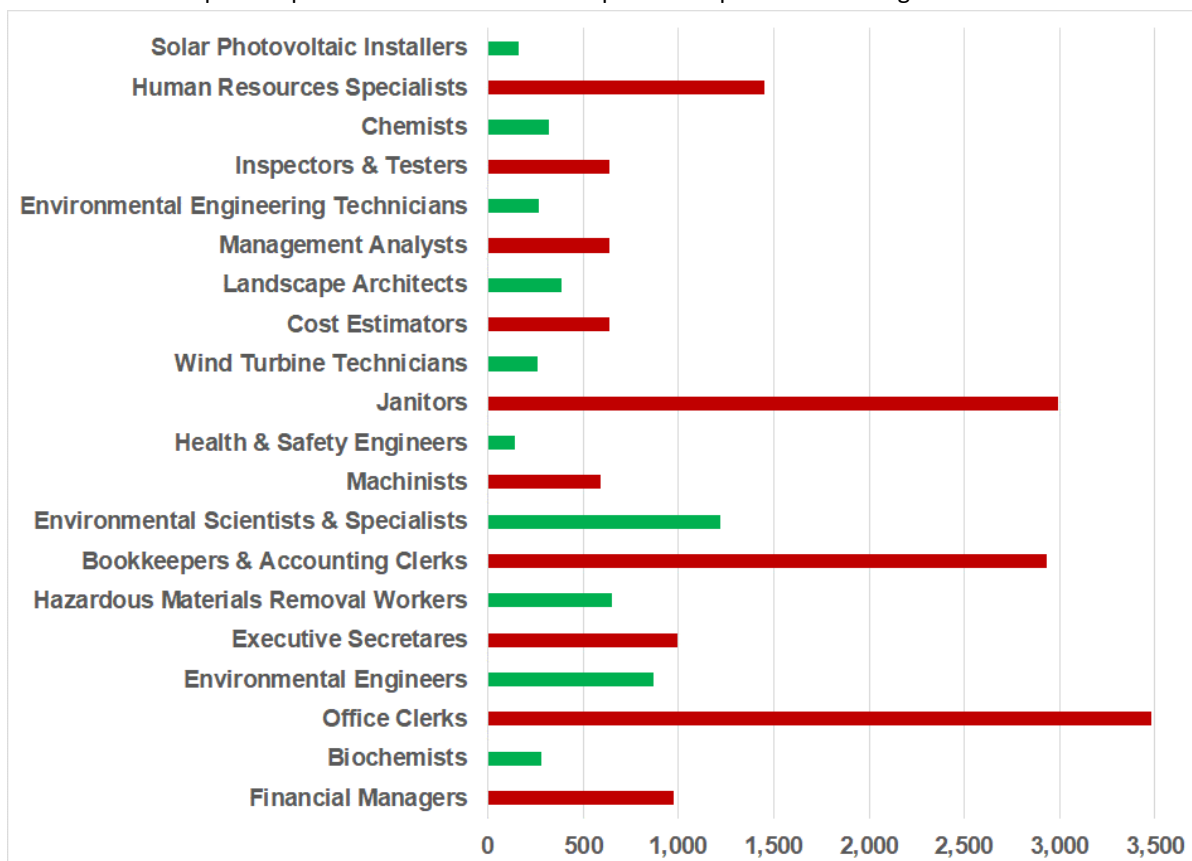


Figure I-2 Green Jobs Generated in Colorado in 2019, by Selected Occupations

Source: Management Information Services, Inc.

## II. GREEN INDUSTRIES AND GREEN JOBS IN PENNSYLVANIA

### II.A. Summary of the Green Industry and Jobs in Pennsylvania

We estimate that in 2019:<sup>8</sup>

- Sales generated by the green economy in Pennsylvania totaled \$42.9 billion.
- The number of green jobs totaled over 376,000.
- The green economy in Pennsylvania comprised 5.3% percent of gross state product.
- The Pennsylvania green economy accounted for 6.6% of the sales of the U.S. green economy.
- Green jobs comprised 6.1 percent of Pennsylvania employment.
- Green jobs in Pennsylvania comprised 4.7 percent of the total number of green jobs in the U.S.

We forecast that, post COVID-19, green jobs will increase three to four times more rapidly than total employment in the state.

Table II-1 shows the industrial distribution of green jobs in Pennsylvania in 2019.

Comparison of the industrial sector distribution of green jobs in Pennsylvania with that of total employment in the state is instructive. A significant portion of the green jobs is in the public administration sector which, given the public nature of green

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

programs, is to be expected. However, most of the green jobs in Pennsylvania are in the private sector, and focusing on these reveals that they are heavily concentrated in several sectors. Of particular note is that the private sector green industry in Pennsylvania is more manufacturing intensive than other average private sector activity in the state:

- Over 16 percent of private sector jobs in the green industry are in manufacturing, compared to nine percent in manufacturing among all private sector industrial activities in Pennsylvania.
- Over 17 percent of private sector green jobs are in professional, scientific, and technical services, compared to less than six percent of all private sector jobs in the state.
- Nearly 10 percent of private sector green jobs are in administrative, support, and waste management services, compared to less than six percent of all private sector jobs in the state.
- Less than three percent of private sector green jobs are in educational services, compared to over four percent of all private sector jobs in the state.

Conversely, there are relatively few private sector green jobs in other parts of the Pennsylvania economy:

- Less than five percent of private sector green jobs are in the retail trade sector, compared to over 10 percent in retail trade among all private sector jobs in the state.
- Less than one percent of green jobs are in the finance and insurance sector, compared to nearly five percent among all private sector jobs in the state.
- A little over one percent of green jobs are in the health care and social service sector, compared to over 17 percent among all private sector jobs in the state.
- Less than three percent of green jobs are in the transportation and warehousing sector, compared to four percent among all private sector jobs in the state.

Assessing the portion of total state employment in each industrial sector accounted for by green jobs indicates that the 376,700 green jobs accounted for about a little over six percent of the total 6.2 million jobs in Pennsylvania in 2019. However, this distribution is uneven among industry sectors:

- Over one-third of employment in the utilities sector consists of green jobs, primarily water, waste treatment, sanitation, and related facilities.
- Nearly ten percent of public administration employment (federal, state, and local) in the state consists of green jobs.
- Nearly 20 percent of Pennsylvania jobs in the professional, scientific, and technical services are green jobs.
- 11 percent of the state's manufacturing employment is green-related
- Only very small portions of total state employment in sectors such as food services, entertainment, real estate, transportation, and retail trade are comprised of green jobs.

**Table II-1 Green Jobs in Pennsylvania in 2019, by Industry**

Industry	2017 NAICS code	Green Jobs
Agriculture, Forestry, Fishing and Hunting	11	3,041
Mining	21	4,189
Utilities	22	9,233
Construction	23	48,990
Manufacturing	31-33	61,505
Wholesale Trade	42	11,836
Retail Trade	44-45	17,393
Transportation and Warehousing	48-49	10,032
Information	51	3,715
Finance and Insurance	52	3,347
Real Estate and Rental and Leasing	53	3,257
Professional, Scientific, and Technical Services	54	65,361
Management of Companies and Enterprises	55	5,659
Administrative/Support/ Waste Management/ Remediation Services	56	37,212

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

Educational Services	61	10,802
Health Care and Social Assistance	62	4,844
Arts, Entertainment, and Recreation	71	1,848
Accommodation and Food Services	72	3,438
Other Services	81	8,478
Public Administration	92	62,474
<b>State Total</b>		<b>376,655</b>

**Source:** U.S. Bureau of Labor Statistics, Pennsylvania Department of Labor, and Industry, and Management Information Services, Inc.

The concentration of green jobs within certain industrial sectors is instructive and interesting. While accounting for a little over six percent of total state employment, the industrial sector composition of green employment is highly skewed in favor of certain sectors. For example, more than 16 percent of private sector green jobs are in manufacturing, compared to nine percent of all private sector employment, and more than 17 percent of private sector green jobs are in professional, scientific, and technical services, compared to less than six percent of all private sector jobs in the state.

This indicates that green investments will provide a greater than proportionate assist to Pennsylvania's high-tech and manufacturing sectors. Pennsylvania is seeking to modernize and expand its high-tech industrial and manufacturing base. Table II-1 indicates that the green industry can aid in this objective.

Similarly, green investments generate, proportionately, three times as many jobs in professional, scientific, and technical services as the state average. Jobs in this sector are the high-skilled, high-wage, technical and professional jobs that Pennsylvania – and other states – seeks to attract and retain. Table II-1 indicates that investments in green protection can be of considerable assistance here.

### II.B. Green Jobs in Pennsylvania by Occupation and Skill

Green jobs in Pennsylvania can be disaggregated by specific occupations and skills, and this information for 2019 for selected occupations is given in Table II-2. This table illustrates that green jobs in Pennsylvania are widely distributed among all occupations and skill levels and, while the number of jobs created in different occupations differs substantially, employment in virtually all occupations is generated by green industries.

As noted, the vast majority of the green jobs created are standard jobs for accountants, engineers, computer analysts, clerks, factory workers, truck drivers, mechanics, etc. and most of the persons employed in these jobs may not even realize that they owe their livelihood to the green economy. This is borne out in Table II-2 and Figure II-1, which list the jobs created by environmental protection in Pennsylvania in 2019 within selected occupations. These show that in 2019 green industries in Pennsylvania generated:

- More jobs for welders (1,281) than for biochemists (481)
- More jobs for office clerks (4,686) than for environmental engineers (322)
- More jobs for executive secretaries and administrative assistants (1,933) than for hazardous materials removal workers (1,314)
- More jobs for bookkeeping and accounting clerks (4,622) than for environmental scientists and specialists (1,816)
- More jobs for machinists (1,186) than for health and safety engineers (341)
- More jobs for janitors (3,177) than for wind turbine technicians (224)
- More jobs for cost estimators (1,002) than for landscape architects (591)
- More jobs for management analysts (1,844) than for environmental engineering technicians (508)
- More jobs for inspectors and testers (1,502) than for chemists (566)
- More jobs for human resources specialists (1,882) than for solar photovoltaic installers (255)

Thus, many workers in Pennsylvania are dependent on the green economy for their employment, although they often would have no way of recognizing that connection unless it is brought to their attention.<sup>9</sup>

The importance of green industries for jobs in some occupations is much greater than in others. For some occupations, such as environmental scientists and specialists, environmental engineers, hazardous materials workers, water and liquid waste treatment plant operators, environmental science protection technicians, wind turbine technicians, refuse and recyclable material

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

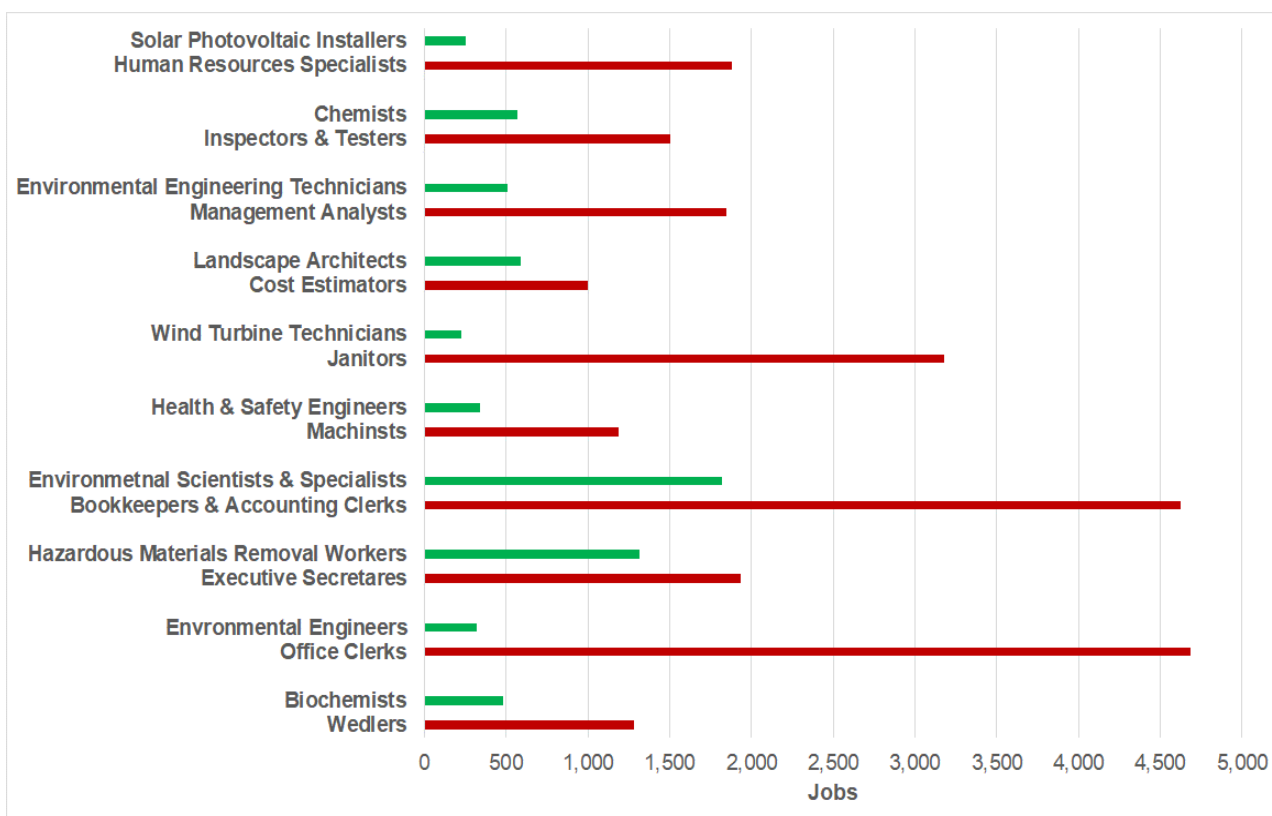
collectors, and environmental engineering technicians, much of the demand in Pennsylvania is created by green activities. This is hardly surprising, for most of these jobs are clearly identifiable as “green” jobs.

**Table II-2 Green Jobs Generated in Pennsylvania in 2019, by Selected Occupations**

Occupation	Jobs
Accountants and Auditors	3,462
Biochemists and Biophysicists	481
Biological Technicians	693
Bookkeeping, Accounting, and Auditing Clerks	4,622
Budget Analysts	207
Chemists	556
Computer Programmers	1,113
Computer Systems Analysts	1,948
Cost Estimators	1,002
Electrical and Electronic Engineering Technicians	508
Database Administrators	986
Electricians	2,001
Environmental Engineering Technicians	322
Environmental Engineers	2,212
Environmental Scientists and Specialists, Including Health	1,816
Executive Secretaries and Administrative Assistants	1,933
Financial Managers	1,898
Geoscientists, Except Hydrologists and Geographers	447
Hazardous Materials Removal Workers	1,314
Health and Safety Engineers	341
Human Resources Specialists	1,882
Industrial Machinery Mechanics	1,640
Inspectors, Testers, Sorters, Samplers, and Weighers	1,502
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	3,177
Landscape Architects	591
Machinists	1,186
Management Analysts	1,844
Mechanical Engineers	1,662
Office Clerks	4,686
Plumber, Pipefitters, and Steamfitters	1,435
Refuse and Recyclable Material Collectors	3,122
Security Guards	1,872
Septic Tank Services and Sewer Pipe Cleaners	1,140
Solar Photovoltaic Installers	255
Truck Drivers, Heavy and Tractor Trailer	2,989
Water and Liquid Waste Treatment Operators	3,041
Welders, Cutters, Solders, and Brazers	1,211
Wind Turbine Technicians	224

**Source:** Management Information Services, Inc.

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania



**Figure II-1 Green Jobs Generated in Pennsylvania in 2019, by Selected Occupations**

Source: Management Information Services, Inc.

However, in many occupations not traditionally identified as green, a greater than proportionate share of the jobs are also generated by the green economy. Recalling that, on average, environment-related employment in Pennsylvania comprises only about six percent of total employment, in 2019 green expenditures generated jobs for a greater than proportionate share of many professional occupations in the state, including:

- Computer software applications engineers
- Electrical and electronics engineers
- Computer programmers
- Landscape architects
- Operations research analysts
- Biochemists and biophysicists
- Computer systems software engineers
- Network systems and data communications analysts
- Medical scientists (except epidemiologists)
- Chemical engineers
- Management analysts
- Civil engineers
- Chemical technicians
- Architecture and civil drafters
- Electrical and electronics engineering technicians
- Chemical plant and system operators
- Chemical technicians
- Mechanical engineering technicians
- Technical writers
- Electrical and electronics drafters
- Electrical and electronics repairers (powerhouse, substation and relay)
- Chemical plant and system operators

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

- Surveying and mapping technicians
- Operating engineers

The above findings are significant for they indicate that state investments in green initiatives and environmental protection will create jobs in greater than proportionate shares in two categories Pennsylvania -- and other states -- are eager to attract:

- College-educated professional workers, many with advanced degrees
- Highly skilled, technical workers, with advanced training and technical expertise, many of them in the manufacturing sector.

Green industries thus generate jobs that are disproportionately for highly skilled, well paid, technical and professional workers, who in turn underpin and provide foundation for entrepreneurship and economic growth.

### III. COMPARISON OF GREEN JOBS IN COLORADO AND PENNSYLVANIA

#### III.A. Green Jobs in Colorado and Pennsylvania

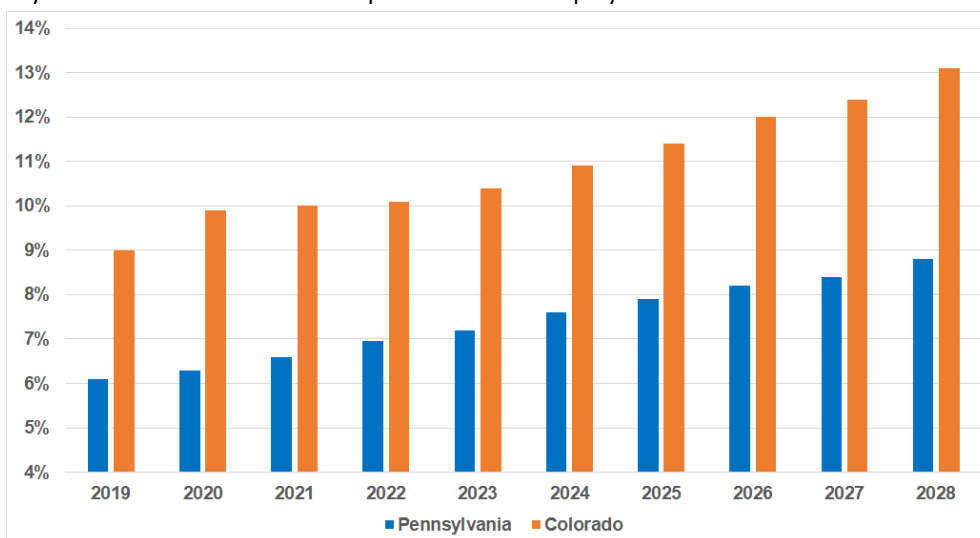
It is instructive to compare green jobs in the two states where a rigorous comparison is now possible: Colorado and Pennsylvania. As discussed, green jobs in Pennsylvania in 2019 comprised just over 6% of the total jobs in the state, and we forecast that this would gradually increase to nearly 9% by 2028.<sup>10</sup>

In comparison, we estimate that green jobs in Colorado comprised about 9% of the total jobs in the state in 2019 and will gradually increase to over 13% by 2028. Thus, as shown in Figure III-1:

- In 2019, green jobs comprised 6.1% of total Pennsylvania employment and 9% of total Colorado employment.
- MISI forecasts that in 2023, green jobs will comprise 7.2% of total Pennsylvania employment and 10.4% of total Colorado employment.
- MISI forecasts that in 2025, green jobs will comprise 7.9% of total Pennsylvania employment and 11.4% of total Colorado employment.
- MISI forecasts that in 2028, green jobs will comprise 8.8% of total Pennsylvania employment and 13.1% of total Colorado employment.

Thus, in both states, the portion of jobs comprised of green jobs will increase by nearly 50% between 2019 and 2028. However, in 2028 green jobs in Colorado will comprise 50% more of total employment in the state than green jobs will in Pennsylvania.

It is important to note that both the portion of green jobs and the numbers of green jobs are increasing substantially in both states. However, since employment in Pennsylvania is forecast to increase very little, 2019 – 2028,<sup>11</sup> whereas employment in Colorado is forecast to increase markedly over this period,<sup>12</sup> the number of green jobs in Colorado will be increasing much more rapidly than in Pennsylvania – both in total and as a portion of total employment.



**Figure III-1 Percent Employment Comprised of Green Jobs in Colorado and Pennsylvania**

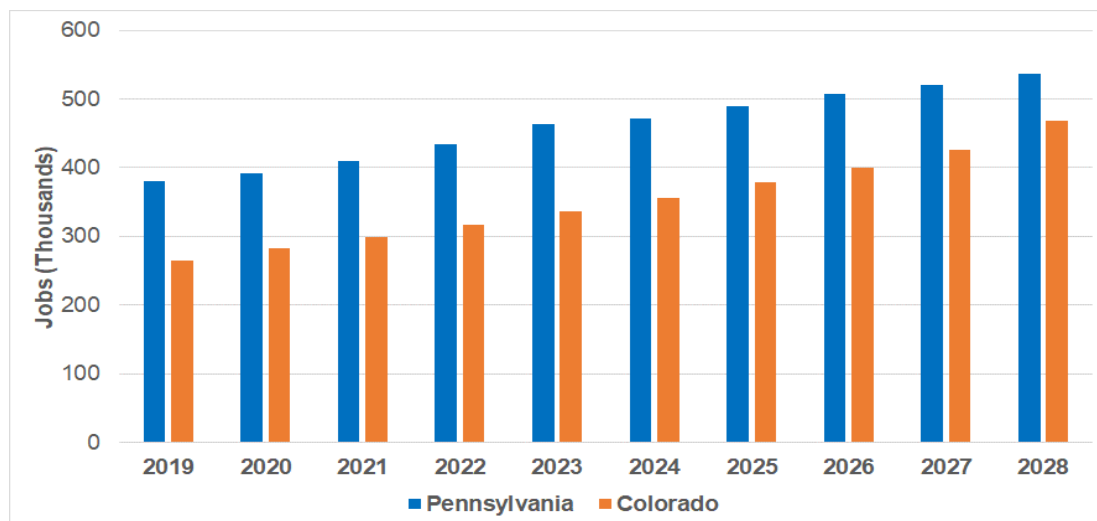
**Source:** Pennsylvania Department of Labor and Industry, State of Colorado, and Management Information Services, Inc.



## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

This is illustrated in Figure III-2, which shows the estimated green jobs in each state, 2019 – 2028. This figure shows that:<sup>13</sup>

- In 2019, there were about 380,000 green jobs in Pennsylvania and about 265,000 in Colorado.
- We forecast that in 2023, there will be about 465,000 green jobs in Pennsylvania and about 335,000 in Colorado.
- We forecast that in 2025, there will be about 490,000 green jobs in Pennsylvania and about 380,000 in Colorado.
- We forecast that in 2028, there will be about 535,000 green jobs in Pennsylvania and about 470,000 in Colorado.
- In 2019, there were about 120,000 more green jobs in Pennsylvania than in Colorado, whereas in 2028 there will be less than 70,000 more green jobs in Pennsylvania than in Colorado – even though total employment in Pennsylvania is about twice that in Colorado.

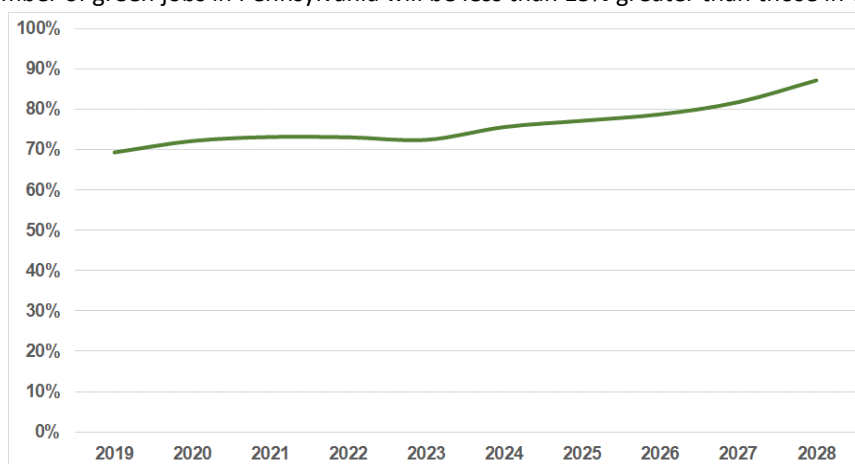


**Figure III-2 Green Jobs in Pennsylvania and Colorado**

**Source:** Pennsylvania Department of Labor and Industry, State of Colorado, and Management Information Services, Inc.

In Colorado, both the total number of jobs and the portion of jobs comprised of green jobs are increasing rapidly, 2019 - 2028. However, in Pennsylvania, whereas the portion of jobs comprised of green jobs is increasing, 2019-2028, total employment in the state over that period is forecast to be nearly stagnant.<sup>14</sup> Thus, Colorado green jobs as a percent of Pennsylvania green jobs increase continuously. As shown in Figure III-3:

- In 2019, the number of green jobs in Colorado were less than 70% of the green jobs in Pennsylvania.
- We forecast that in 2024, the number of green jobs in Colorado will total more than 75% of the green jobs in Pennsylvania.
- We forecast that in 2028, the number of green jobs in Colorado will total more than 87% of the green jobs in Pennsylvania.
- In 2019, the number of green jobs in Pennsylvania were 45% greater than those in Colorado.
- In 2028, the number of green jobs in Pennsylvania will be less than 15% greater than those in Colorado.



**Figure III-3 Green Jobs in Colorado as a Percentage of Green Jobs in Pennsylvania**

**Source:** Pennsylvania Department of Labor and Industry, State of Colorado, and Management Information Services, Inc.

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

### III.B. Green Jobs by Industry and Occupation

Comparison of the distribution of green jobs among industry sectors in both states yields interesting results. As shown in Figure III-4, in some sectors the percent distribution of green jobs is similar. These include:

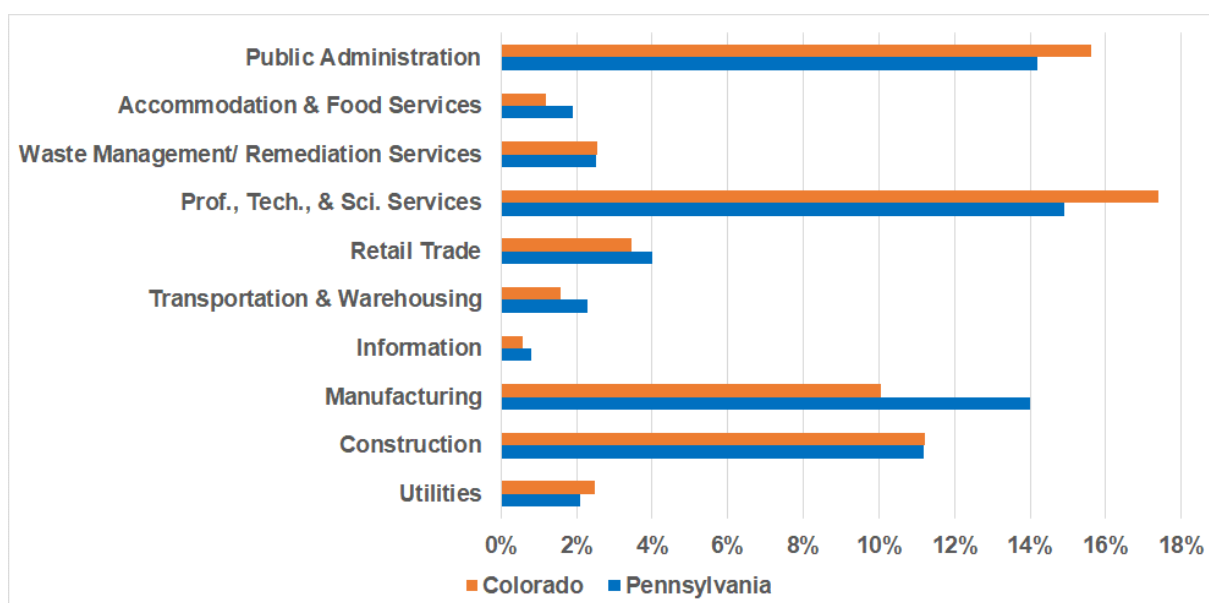
- Construction
- Utilities
- Waste Management/Remediation Services
- Information

In some sectors, the percent of green jobs in Pennsylvania is substantially greater than in Colorado. These include:

- Manufacturing
- Accommodation and Food Services
- Retail Trade

In some sectors, the percent of green jobs in Colorado is substantially greater than in Pennsylvania. These include:

- Professional, Technical, and Scientific Services
- Public Administration



**Figure III-4 Industry Sector Distribution of Green Jobs, 2019**

**Source:** Management Information Services, Inc.

There are substantial differences in the occupational distribution of green jobs in each state. While the total number of green jobs in Pennsylvania in 2019 was more than 30% larger than the number of green jobs in Colorado, green jobs by occupation differed much more.<sup>15</sup> As shown in Figure III-5, for some occupations the green job differential between the two states is much greater than 30%. These include:

- Sewer and Pipe Cleaners
- Environmental Engineers
- Health and Safety Engineers
- Database Administrators

Figure III-5 also shows that for some occupations the green job differential between the two states is about the average of 30%. These include:

- Budget Analysts
- Environmental Engineering Technicians
- Human Resources Specialists
- Office Clerks
- Truck Drivers
- Plumbers and Pipefitters

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

Figure III-5, also shows that for some occupations the green job differential between the two states is below the average of 30%. These include:

- Wind Turbine Technicians
- Accountants and Auditors
- Electricians

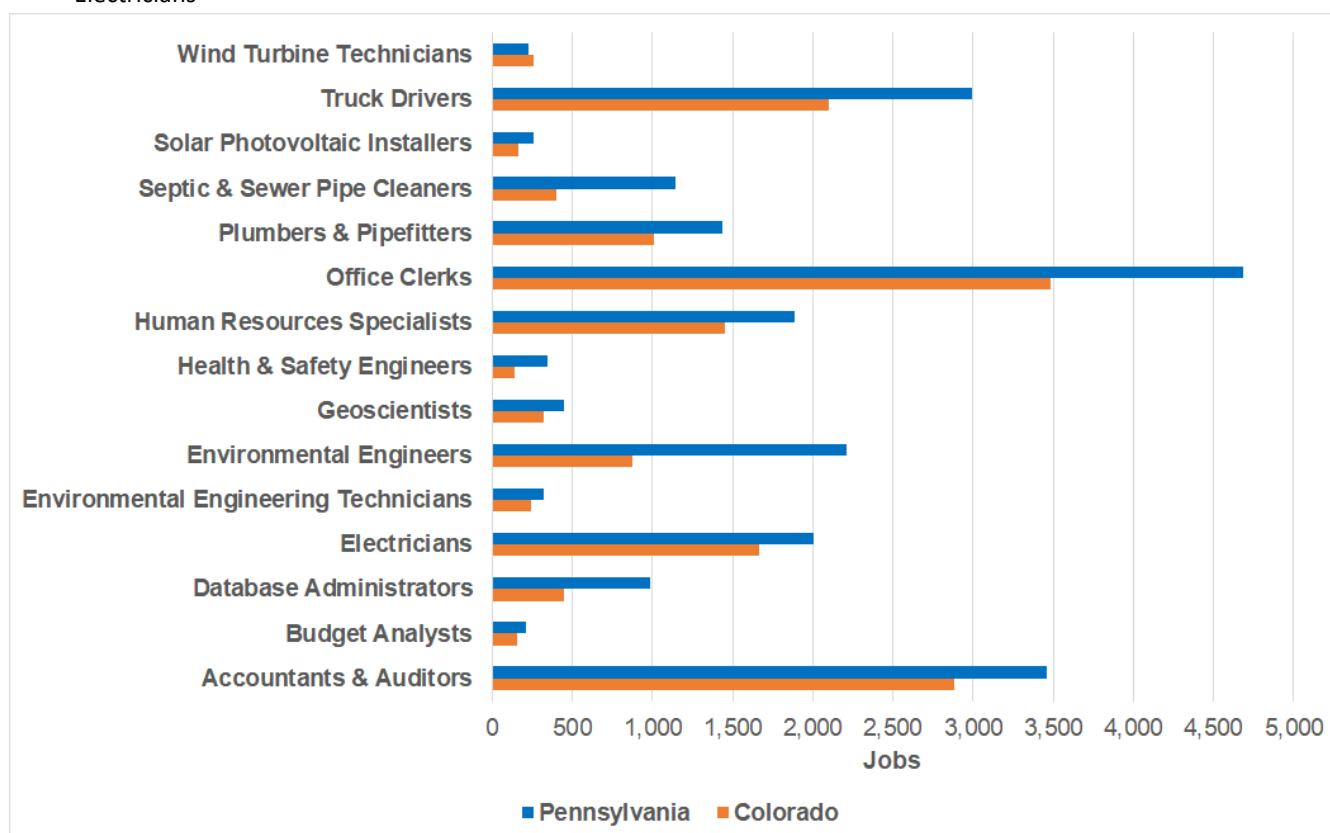


Figure III-5 Green Jobs by Occupation in Pennsylvania and Colorado, 2019

Source: Management Information Services, Inc.

### IV. IMPLICATIONS OF THE COMPARATIVE FINDINGS

Comparison of green jobs in only two states cannot yield determinant findings.<sup>16</sup> Further, the forecasts are subject to a considerable degree of uncertainty. While there is a high level of confidence that the number of green jobs will continue to increase in both absolute and percentage terms, the rate of increase of these jobs is subject to considerable uncertainty. For example:

- Following U.S. Energy Information (EIA) conventions, the forecasts are based on current, existing (as of August 2022) policies and enacted legislation.<sup>17</sup>
- The rate of green jobs growth could accelerate if additional environmental legislation and more aggressive renewable energy and climate change incentives and mandates – such as those outlined in COP26<sup>18</sup> -- are enacted at the national and state levels.
- The rate of green jobs job growth could decrease if there is a lessening of green awareness and a backlash against ambitious environmental and climate legislation and regulations.<sup>19</sup>
- Unforeseen circumstances, such as severe recessions, pandemics, war, political developments, etc., could materially affect the forecasts.<sup>20</sup>

Further, many emerging green jobs do not currently exist and do not have occupational titles defined in federal and state government occupational handbooks and employment guides.<sup>21</sup> In addition, many of these new jobs require different skills and education than current jobs, and training needs must be determined to enable this rapidly growing sector of the U.S. economy and labor market to have a sufficient supply of trained and qualified employees. Eventually, most of these occupations will grow, the number of employees classified in the occupations will increase, and federal and state governments will add them to the employment classifications. Until then, labor market, employment, and education and training analyses and forecasting will be performed using the current set of U.S. Labor Department occupational titles and job descriptions.<sup>22</sup>

## Comparative Analysis of USA Green Industries and Green Jobs in Colorado and Pennsylvania

Nevertheless, a comparison of the two states does provide some interesting findings and potential implications.

First, the number of future green jobs in a state is determined by the increasing portion of total jobs in the state comprised of green jobs and the rate of growth of employment in the state. Thus, green jobs in Colorado are forecast to increase more rapidly than in Pennsylvania because the portion of total employment in Colorado comprised of green jobs is increasing more than in Pennsylvania and, more important, because total employment in Colorado is increasing much more rapidly than in Pennsylvania.

Second, the changes mentioned above will alter the future distribution of U.S. green jobs among the states. Thus, for example, in 2019, green jobs in Pennsylvania accounted for about 4.7 percent of the total number of green jobs in the U.S. and green jobs in Colorado comprised about 3.3 percent of the total number of green jobs in the U.S. By 2028, the portion of U.S. green jobs in Pennsylvania will be less than in 2019, whereas the portion of U.S. green jobs in Colorado will be greater than in 2019. Similar comments apply to most other states. States where employment and the portion of green jobs are growing rapidly will increase their portion of U.S. green jobs; those states where employment and the portion of green jobs are growing slowly will decrease their portion of U.S. green jobs.

Third, the distribution of green jobs among industry sectors in states will differ. Here, for example, we found that in some sectors, the percent of green jobs in Pennsylvania is substantially greater than in Colorado. These include Manufacturing, Accommodation and Food Services, and Retail Trade. We also found that in some sectors, the percent of green jobs in Colorado is substantially greater than in Pennsylvania. These include Professional, Technical, and Scientific Services and Public Administration. Such differences in the industry sector distribution of green jobs are likely among most other states.

Finally, we found that there are substantial differences in the occupational distribution of green jobs in Colorado and Pennsylvania. While the total number of green jobs in Pennsylvania in 2019 was more than 30% larger than the number of green jobs in Colorado, green jobs by occupation differed much more. For some occupations the green job differential between the two states is much greater than 30%; for some occupations the green job differential between the two states is about the average of 30%; and for some occupations the green job differential between the two states is below the average of 30% -- in fact, we found that there were actually more Wind Turbine Technicians in Colorado than in Pennsylvania despite the fact that the total number of jobs in Pennsylvania is much larger than the total number of jobs in Colorado.<sup>23</sup> Once again, similar occupational differences are likely among most other states.

It is thus imperative that similar analyses be conducted for other states to measure and forecast state green economies and the jobs generated by these economies to expand and generalize the findings reported here.

### ACKNOWLEDGEMENT

The author is grateful to Richard Ramirez, Art Bilger, Joan Lynch, Ramona Schindelheim, Robert Wendling, and Paula DiPerna for assistance in the course of this research. This work was supported by WorkingNation and the Walton Family Foundation.

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- 1) <https://thenext100.org/greenjobs/>.
- 2) The employment concept used here is a full time equivalent (FTE) job in the U.S. An FTE job is defined as 2,080 hours worked in a year's time, and adjusts for part time and seasonal employment and for labor turnover. The FTE concept normalizes job creation among full time, part time, and seasonal employment. Thus, for example, two workers each working six months of the year would be counted as one FTE job. An FTE job is the standard job concept used in these types of analyses and allows meaningful comparisons over time and across jurisdictions because it consistently measures the input of labor in the production process.
- 3) Management Information Services, Inc., "The Green Economy, Green Jobs, and Green Companies in Colorado," prepared for WorkingNation, May 2022; <https://workingnation.com/wp-content/uploads/2022/08/Green-Economy-of-Colorado.pdf>.
- 4) Here, green jobs are defined as the total number of jobs generated by the green economy. We estimated the total (direct, indirect, and induced) jobs created by the green economies: i) Direct jobs are those created directly in the specific activity or process; ii) indirect jobs are those created throughout the required interindustry supply chain; iii) induced jobs are those created in supporting or peripheral activities; total jobs are the sum or all of the jobs created – direct, indirect, and induced. The total (direct, indirect, and induced) jobs concept is the accepted methodology widely used in studies of this

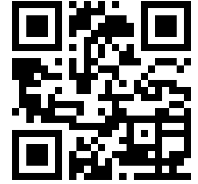
nature and in the peer-reviewed literature. See the discussion in Roger H. Bezdek, "Jobs Created by the Green Economy in the USA," *Environment and Pollution*, Vol. 11, No. 1, (March 2022), pp. 21-32.

- 5) <https://www.census.gov/naics/>.
- 6) See the discussion in Management Information Services, Inc., "The Green Economy, Green Jobs, and Green Companies in Pennsylvania," prepared by for WorkingNation, May 2022; <https://workingnation.com/wp-content/uploads/2022/08/Green-Economy-of-Pennsylvania.pdf>
- 7) See Roger H. Bezdek, Robert M. Wendling and Paula DiPerna, "Environmental Protection, the Economy, and Jobs: National and Regional Analyses," *Journal of Environmental Management*, Vol. 86, No. 1 (January 2008), pp. 63-79.
- 8) Management Information Services, Inc., "The Green Economy, Green Jobs, and Green Companies in Pennsylvania," op. cit.
- 9) Bezdek, Wendling, and Paula DiPerna, op. cit.
- 10) Management Information Services, Inc., "The Green Economy, Green Jobs, and Green Companies in Pennsylvania," op. cit.
- 11) Pennsylvania Department of Labor & Industry Center for Workforce Information & Analysis, "Pennsylvania Industry Employment 2018-2028 Long-Term Projections," [https://www.workstats.dli.pa.gov/Documents/Projections/Industrial/PA/PA\\_LTIP.pdf](https://www.workstats.dli.pa.gov/Documents/Projections/Industrial/PA/PA_LTIP.pdf).
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- 13) Pennsylvania job forecasts are derived in Management Information Services, Inc., "The Green Economy, Green Jobs, and Green Companies in Pennsylvania," op. cit.
- 14) Pennsylvania Department of Labor & Industry Center for Workforce Information & Analysis, op. cit.
- 15) Pennsylvania green jobs by occupation are given in Management Information Services, Inc., "The Green Economy, Green Jobs, and Green Companies in Pennsylvania," op. cit.
- 16) However, these findings and their implications can be further assessed as additional state reports are completed.
- 17) See U.S. Energy Information Administration, *Annual Energy Outlook 2022*, February 2022.
- 18) See <https://ukcop26.org/>.
- 19) For example, such as the "yellow vest" protests in France; <https://www.reuters.com/article/us-france-electricity/yellow-vests-put-french-government-on-spot-over-power-prices-idUSKCN1PO25Y>.
- 20) For example, since the Russian invasion of Ukraine worldwide interest in green technologies has increased greatly.
- 21) See the discussion in Management Information Services, Inc., See Management Information Services, Inc., "Defining and Estimating the U.S. the Green Economy and Green Jobs, prepared WorkingNation, 2022; <https://workingnation.com/the-green-economy-its-bigger-than-you-think-and-growing-rapidly/>.
- 22) These are listed in the U.S. Department of Labor, Bureau of Labor Statistics, *Standard Occupational Classification*, <https://www.bls.gov/soc/>. Also see U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook*, <https://www.bls.gov/ooh/>.
- 23) There are more than twice as many jobs in in Pennsylvania than in Colorado.



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## Study of Timor Deer Behavior at the Exit Conservation Location of Cakura Village, Takalar Regency



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<sup>1,2,3</sup>PT Pertamina Patra Niaga Integrated Terminal Makassar

**ABSTRACT:** The study of the behavior of the Timor deer was carried out at an ex-situ conservation site in Cakura Village, Takalar Regency. This study aims to determine the daily activities of Timor deer which are conserved in semi-open captivity by applying the Talaparusi system, with the method of focal animal sampling. This research was conducted in May 2022. Observations were carried out for 14 days (2 weeks). The results of this study indicate that differences in the time period of the morning, afternoon and evening affect the duration of daily activities carried out by both male and female Timor deer. The activities observed included resting activities, ingesting activities, playing activities, grooming activities. Observations on the behavior of the Timor deer in captivity showed that the activities of the Timor deer were dominated by resting activities of 53.99%. Then, followed by eating or ingesting activities by 22.13%. Furthermore, playing activities are in third position with a percentage of 17.17%. The least activity carried out was self-cleaning or grooming by 6.69%.

This study also describes the difference in the duration or time required for male Timor deer and female Timor deer in carrying out the observed activities.

**KEYWORDS:** timor deer, conservation, pertamina, cervus timorensis, cakura village.

### INTRODUCTION

The Timor deer (*Cervus timorensis*) is one of Indonesia's endemic animals whose population continues to decline. Based on the total population and distribution, the International Union for Conservation of Nature's Red List or better known as the IUCN Red defines the Timor deer as a vulnerable species. In addition, based on the Minister of Environment and Forestry Regulation (PERMEN) of the Republic of Indonesia number 106 of 2018, the Timor deer is designated as a protected animal.

As an effort to increase awareness of protected animals, in 2020 the Timor deer (*rusa timorensis*) became one of the icons of the National Puspa and Animals Love Day (HCPSN). National Puspa and Animal Love Day (HCPSN) itself is an activity held with the aim of commemorating environmental day and increasing awareness and conservation of flora and fauna. HCPSN is commemorated every 5 November in accordance with Presidential Decree (Keppres) No. 4 of 1993 which was signed by President Soeharto.

Based on IUCN Redlist data, since 2008 the Timor deer has been categorized as vulnerable, compared to 1996 the Timor deer has a lower risk status. The decline in the population of the Timor deer above resulted in a change in the status of the number of species. This change in status is caused by the total original population of Timor deer in the area, which is estimated to be less than 10,000 mature individuals, and is estimated to have declined over three generations due to habitat loss and community hunting (IUCN, 2015). This is due to the lack of awareness of the local community who still see deer as a liar animal that can be hunted freely and their habitat has land rights due to the conversion of forest functions.

The decline in the Timor deer population in the wild makes the Timor deer conservation an absolute must. One form of conservation is ex-situ conservation in the form of captivity. Captive breeding is the maintenance and breeding of wild animals with the aim of ensuring the maintenance and development of their sustainable use, both as animal consumption, tourism, as well as for educational and scientific purposes (Fitriyanty et al., 2014). The requirements for captivity for Timor deer are by choosing land overgrown with grass, available trees as shade, water pools, and the enclosure area being given a guardrail (iron or concrete) (Garsetiasih, 2002). One of the breeding sites in Takalar Regency, South Sulawesi Province is located in Cakura Village which involves the local community.

The Timor Deer Captive in Cakura Village is a captivity that implements the Talaparusi system, which is an integrated and sustainable people-based deer management system. Talaparusi is run with the 3K principles, namely Partnership, Sustainability,



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Welfare. The partnership in question is the collaboration between the South Sulawesi Natural Resources Conservation Center, the community who are members of the Timor deer breeder group, and the stakeholder involved in this is PT Pertamina Patra Niaga Integrated Terminal Makassar. On the sustainability aspect, it is realized as a Talaparusi program and its resource support. Meanwhile, the welfare aspect is the health of the forest area, the welfare of animals and the welfare of the community.

As for the breeding, the Timor deer breeding in Cakura village applies semi-open breeding by utilizing the land or yard of local residents' houses.

The change in the habitat of the Timor deer from the wild to semi-open captivity has resulted in several changes, including the nature of the Timor deer which is active at night (nocturnal) now tends to be more active during the day (diurnal).

This study aims to determine the daily activities of Timor deer which are conserved in semi-open captivity by applying the Talaparusi system. The benefits of this study are to provide data related to information on the daily behavior of Timor deer to breeders and prospective breeders as well as to provide input on good and efficient Timor deer breeding conditions in supporting the increase in the Timor deer population. In addition, knowledge, especially the daily behavior of Timor deer, feeding behavior and knowledge of the feed preferred by deer is needed to support the success of captive efforts (Sita & Aunurohim, 2013).

### SUBJECTS AND METHODS

The type of research used is quantitative research with an observational descriptive approach. This research was focused on the Timor deer conservation area CSR PT Pertamina Patra Niaga Integrated Terminal Makassar, namely in Cakura Village, Takalar Regency, South Sulawesi on 23 May – 5 June 2022. Observations on the daily behavior of the Timor deer were carried out in 1 Timor deer conservation cage inhabited by a pair Timor deer and a young Timor deer. The tools used in this study include watches, smartphones, digital cameras, stationery, and laptops.

Behavioral variables observed included eating (ingesting), resting (resting), playing (playing) and grooming (grooming). For the pattern of time use, the variables measured include the time allocation needed for each type of activity or activity using the focal animal sampling method. Observations were made every 07.00 WITA and ended at 18.00 WITA. Observations were divided into three times groups, namely morning (07.00 – 10.00), afternoon (10.00 – 14.00), and afternoon (15.00 – 18.00). Each observation period was recorded continuously for all the activities of the Timor deer seen with an observation interval of 10 minutes then a 5 minutes rest and so on until the end of the observation.

#### Habituation

Habituation is the process of observing observers or researchers such as observing deer which is the object of research easier to do. Furthermore, the individual does this by giving the Timor deer a name as a distinguishing mark based on its physical characteristics such as body size and body shape. This process is carried out before the research data is taken.

#### Focal Animal Sampling

*Focal animal sampling* is a way of observing animal behavior by recording their daily behavior based on predetermined time intervals (Sofyan I, Setiawan A, 2018).

This is in line with Martin and Bateson (1993), observing the behavior of a particular individual or focus individuals who are first seen in an event. This method is used to observe individual focus continuously. The observer observed the behavior of the individual Timor deer which had been designated as the object of research for 14 days. In other words, focal animal sampling is used to observe individuals directly at the captive location for a time interval of 10 minutes, so that the duration of the behavior that appears during the observation is obtained.

### DISCUSSION

The deer in Cakura Village, Takalar Regency is a type of Timor deer (*Cervus timorensis*). The physical characteristics of this deer are having a concave forehead, short limbs, an adult deer weighing 60 to 100 kg, and black fur.

As for the classification of the Timor deer, it can be seen in table 1 regarding the taxonomy of the Timor deer.

## Study of Timor Deer Behavior at the Exit Conservation Location of Cakura Village, Takalar Regency

Table 1. Timor deer taxonomy

Kingdom	Animalia
Phylum	Chordata
Class	Mamalia
Order	Cetartiodactyla
Family	Cervidae

Deer conservation is carried out by implementing semi-open captivity that utilizes local land or yards. Based on the observations that have been made, the Timor deer has a low level of aggressiveness, making it easy to collect data.



Picture 1 Timor deer at the research site

Picture 1 above, you can see a fawn taking cover behind its mother (adult female sires) and male sires adults are resting in the corner of the captive cage. The general conditions at the Timor deer conservation site in Cakura Village are usually active fawns but do not interfere with the research process.

The results of the study show that there are differences in the duration required for each daily activity of the Timor deer in the CSR conservation area of PT Pertamina Patra Niaga Integrated Terminal Makassar Cakura Village in each activity period, namely morning, afternoon, and evening. Most of the time allocation is used for resting activities by 53.99%, then eating activities by 22.13%, playing activities by 17.17%, and finally cleaning activities by 6.69%. For more details, see table 2 below.

Table 2. Percentage of Timor deer activity

No.	Types of Daily Activities	Total Time (Minutes)	Percentage (%)
1.	<i>resting</i>	250	53,99
2.	<i>ingesting</i>	102,5	22,13
3.	<i>Playing</i>	79,5	17,17
4.	<i>grooming</i>	31	6,69
	<b>Total</b>	<b>463</b>	<b>100</b>

## Study of Timor Deer Behavior at the Exit Conservation Location of Cakura Village, Takalar Regency

### Resting

The results showed that the rest activities carried out by the Timor deer occurred at all times of the study, namely in the morning, afternoon, and evening. Rest activity by Timor deer in captivity does not form a certain pattern because this activity occurs randomly either before eating, before eating, or after doing other activities. Resting activities are carried out by the Timor deer as an activity that intersects eating and playing activities.

Rest activities are carried out in several places, including under the baruga (semi-permanent building) which was deliberately built as a resting place and shelter by the Timor deer which is being conserved. In addition, rest is also done in the corners and on the sides of the captive cage after doing other activities.

This activity is also carried out as a step to take shelter and shelter from the hot sun during the day.

**Table 3. Timor deer rest activity duration**

Activities	Stag (Minutes)			Female deer (Minutes)		
	Morning	Afternoon	Afternoon	Morning	Afternoon	Afternoon
Resting	10	155	177	15	140	103

Table 3 shows that both male and female deer rest the most during the day, each of which is 155 minutes for male deer and 140 minutes for female deer. Meanwhile, the morning is the least time for the Timor deer to rest, which is 10 minutes for the stag and 15 minutes for the Timor deer. This is because in the morning the male and female deer are more active in other activities.



**Picture 2 A female Timor deer resting in Baruga**

### Ingesting

Food is needed as an energy supply, cell building material, growth, and protein synthesis processes in the body (Lelono, 2004). The eating activity of the Timor deer is carried out in a standing position and is not carried out in a sitting position and/or disturbed. There was no dominance between the male Timor deer and the female Timor deer at mealtime. The feed consumed is grass and corn as shown in the following table.

**Table 4. Type of feed given**

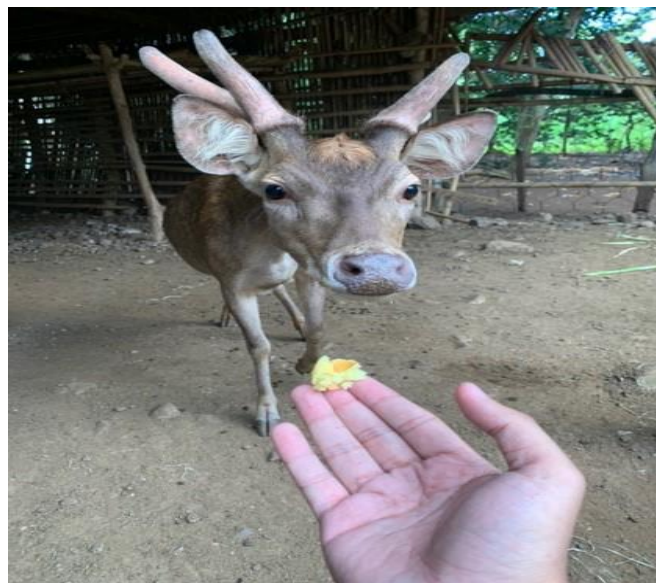
No.	Feed type	Presentation	Consumed part
1.	grass	Whole and Chopped	Whole grass (without roots)
2.	corn	In the form of seeds (chopped)	Corn kernels
3.	Bread	Given little by little	Whole piece of bread

## Study of Timor Deer Behavior at the Exit Conservation Location of Cakura Village, Takalar Regency

Grass and corn are feeds that are routinely given to deer by breeders, but deer also eat grass that grows in captivity.



Picture 3 Timor deer being fed corn



Picture 4. Timor deer being fed bread

The results of observations at the study site showed that eating activities reached 53.99% of the total time in one day. In this study, researchers also found differences in the time it took for male and female deer to do this feeding activity as shown in table 5 below.

Table 6 above shows that the playing activity of the male Timor deer is longer than the duration of the playing activity of the female Timor deer. Table 6 shows that the stags are most active in playing in the morning and the least in the afternoon. This is not the case with the female deer. Even though early morning is the most active time to play, the least playing time occurs during the day.

Table 5. Duration of Timor deer eating activities

Activity	Stag (Minutes)			Female Deer (Minutes)		
	Morning	Afternoon	Afternoon	Morning	Afternoon	Afternoon
Eat	40	15	40	50	20	40

### Playing

Playing activities generally occur at all times, namely in the morning, afternoon, and evening. The result showed that the longest playing activity by the Timor deer was in the morning. This applies to both male and female deer.



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Table 6. Duration of playing activities of Timor deer

Activity	Stag (Minutes)			Female Deer (Minutes)		
	Morning	Afternoon	Afternoon	Morning	Afternoon	Afternoon
Playing	40	30	15	37	15	22

The female Timor deer during the observation spent more time on resting activities and looking after the young of the deer. This happened because at the time of the study there were 2 months old Timor deer chicks placed in the same place as the Timor deer broodstock.



Picture 5 Timor deer playing in the afternoon

### Grooming

Self-cleaning or grooming activities are the least time-consuming activities. This activity includes hair licking. Grooming is not only for the individual deer but also as a form of parental love for the deer chicks. Like Sionora's opinion, which said that grooming behavior is a manifestation of the affection shown by parents to their children or to fellow species (Sionora, 2010).

In table 7 it can be seen that the most frequent self-cleaning or grooming activities occur in the morning and afternoon by both male and female Timor deer.

Table 7. Duration of self-cleaning Timor deer

Activity	Stag (Minutes)			Female Deer (Minutes)		
	Morning	Afternoon	Afternoon	Morning	Afternoon	Afternoon
Grooming	13	13	9	14	13	0

This activity is usually done by licking the hair on the deer's body parts such as the back, legs, and stomach. During observations, it is not uncommon for male deer to lick the body of a stag and a male deer to lick the body of a female deer. Self-cleaning or grooming activities at the study site are also in accordance with the results of Masyud et al., (2007) research.

Which states that grooming is usually carried out between a female parent and her young deer, between a male and a female or even done alone in between eating and resting activities.

### CONCLUSIONS

Differences in the time period of the morning and afternoon, and affect the duration of daily activities carried out by both male and female deer. The results of this study indicate that the difference in the morning time period affects the duration of daily activities carried out by both male and female deer. Observations on the behavior of the Timor deer in captivity showed that the activities of the Timor deer were dominated by resting activities of 53.99%. Then, followed by eating or ingesting activities by

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22.13%. Furthermore, playing activities are in the third position with a percentage of 17.17%. The least activity done is cleaning or grooming by 6.69%.

Further research related to the correlation between the size of the captive cage and the behavior of the Timor deer needs to be done so that it can complete the conclusions and results of this study. In addition, in future research, it is hoped that there will be a comparison cage location that can enrich the results of the study.

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## Video Tutorial Lessons Using 5W1H Model in Enhancing the Numeracy Skills of Grade 8 Non-Numerate Students



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**ABSTRACT:** The study aimed to determine the effectiveness of using video tutorial lessons (VTLs) based on the 5W1H model on non-numerate grade 8 students. 44 non-numerate grade 8 students were identified and used as study respondents. The pretest was employed, followed by utilizing the VTLs and posttest administration. The study identified the personal related factors of the respondents in terms of instructional resources, learning environment, and parental support. The level of acceptability of the designed video tutorial lessons was determined in terms of content and technical production. The study also determined whether there is a significant difference in the pretest and posttest scores of Grade 8 students before and after using the VTLs. A significant relationship between variables was also tested using Pearson  $r$ . The findings revealed that the personal related factors for instructional resources of the respondents were printed modules, touchscreen cellphone and television. Likewise, learning environment and parental support are good as their personal related factors. In the pretest result, the respondents do not have mastery in measurement, calculating, patterns and relationships, and rational. On the other hand, they ranged from nearing mastery to mastery level in spatial and interpreting. Further, the level of acceptability of the respondents and experts on the quality of VTLs using the 5W1H model in terms of content and technical production. It improves the level of numeracy skills of the Grade 8 students based on the post-assessment results ranging from nearing mastery to mastery in measurement, calculating, patterns and relationships, and rational. Moreover, the respondents' numeracy skills and the personal related factors do not significantly correlate. The respondents' numeracy skills and the level of acceptability of the quality of the video tutorial lessons are not significantly correlated. Last but not least, there is a considerable change in the Grade 8 students' posttest results compared to their pretest scores after using the video tutorial lessons.

**KEYWORDS:** 5W1H model, numeracy, video tutorial lesson (VTLs).

### I. INTRODUCTION

Students' Mathematics performance is one of the main concerns in Mathematics education. Many students perceive mathematics as one of the difficult core subjects to be learned. This negative thinking can be due to many factors that hinder their mathematics learning (Rameli & Kosnin, 2016). While Math looks challenging to Fleming (2019) because it requires time and effort. Many pupils don't have enough time for math classes, and when the teacher goes on, they fall behind. Many continue their studies of more difficult ideas on unstable ground. Villegas (2021) said in his paper that there were troubling indications of an education crisis in the Philippines, particularly in mathematics, even before the epidemic. The study from the Organization for Economic Co-operation and Development's (OECD) Program for International Student Assessment (PISA) in 2018 that showed Filipino pupils doing the worst among 79 nations in mathematics was the source of the crisis's most extensively reported news. Filipino 15-year-old pupils scored 353, compared to the 489 averages for both groups in the OECD. In PISA 2018, the Philippines performed worse in mathematics than the majority of the economy and participating nations.

The Philippines, on the other hand, came in last place out of 58 participating nations in the worldwide evaluation for Grade 4 mathematics pupils, according to Mendoza (2020). According to the Trends in International Mathematics and Science Study 2019 (TIMSS) by the International Association for the Evaluation of Educational Achievement, Filipino children in Grade 4 only received an average scale score of 297 in math, placing them last in this exam. The researcher wanted to determine if using VTL's will enhance the numeracy skills of the grade 8 non-numerate students. The researcher also wanted to determine if there is a significant relationship between the personal related factors and the numeracy skills of the respondents; if there a significant

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relationship between level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents; and if there a significant difference between the pretest and posttest scores of the Grade 8 students after using the VTL's. Mathematics has some inherent difficulties due to its abstract and cumulative nature. Students requires a firm foundation; they may not be able to learn new things without previous knowledge. For many students' expectancy about the difficulty of Math is high, and personal value attached with Math is low (Gafoor & Kurukkan, 2015). In the Program for International Student Assessment (PISA), a student assessment of 15-year-old learners across 79 countries done by the Organization for Economic Co-operation and Development (OECD), the Philippines ranked in the low 70s in the 2018. Filipino students ranked low in Mathematics, with 353 points against a 489 OECD average (Paris, 2019). Meanwhile, in the article of Magsambol (2020), The Trends in International Mathematics and Science Study (TIMSS) 2019 shows the Philippines scored 'significantly lower' than any other country that participated in Grade 4 Math assessments. Filipino students lagged behind other countries in the international assessment for Mathematics for Grade 4. The Philippines only scored 297 in Mathematics which is significantly lower than any other participating country. The country also scored the lowest among all 58 participating countries for Mathematics. It entails that there is a need to improve the numeracy skills of the students. In the new normal setup in education, DepEd will implement remote or distance learning instead of face-to-face classes. This method delivers class through online, TV, radio and printed materials like the modules (Nicholls, 2020). In DepEd – Division of Quezon, modular distance learning is being implemented. One problem in the modular distance learning is if the parents were not able to finish their schooling. In modular distance learning, there will be a remote learning where in the modules will be done inside the learners' home. Parents will be the one to guide or assist the pupils (Fernando, 2020). According to Azubuike & Aina (2020), parents do not know how to teach their children because they do not have an adequate training to do so. In addition, most of them were not able to finish their schooling too. Some of the parents do not know how to read and write. Students tend to be less motivated in reading and answering their modules since what they only see are the printed modules. These factors add to the challenges in teaching Mathematics among the student. In Castañas National High School where printed modular is implemented, the researcher observed the challenges encountered in Mathematics subject by the Grade 8 students. It is evident in total mean percentage scores (MPS) wherein the mathematics got the lowest mean in all the eight subjects. Moreover, Grade 8 level got the lowest MPS among the other grade levels in Mathematics. It was also shown from School Year 2015-2021. In the recent administration of yearly numeracy test in the school, almost 50% of most of the sections are found non-numerates. It means that there is really a need to establish the numeracy skills of the Grade 8 students in Mathematics. Since Mathematics subject has the lowest among the subjects, and the Grade 8 Mathematics has the lowest MPS among the other grade levels, the researcher chose the Grade 8 Mathematics as the focus of this study. Increasing the numeracy skills is vital to the quality of education of the Grade 8 students in Mathematics. Thus, the researcher became interested in conducting this inquiry. The researcher made a video tutorial lesson guided by 5W1H model to enhance the numeracy skills of Grade 8 students because he believes that through videos students will be more motivated on their studies rather than reading the printed module alone (Panergayo & Aliazas, 2021). The video tutorial lessons were validated by three (3) master teachers in mathematics in Quezon province and two (2) mathematics experts from Laguna State Polytechnic University with the necessary permission from the authorities. The questionnaire which was adopted and modified from the study of Ali, et al. (2017) entitled "Instructional Video Evaluation Instrument" was used in validating the video tutorial lesson. Making of video tutorial lessons guided by 5W1H model is the main preference of the researcher because it can be access by the Grade 8 students during the modular distance learning. Based on the pre-test results, the researcher identified the competencies and skills where the students have weak foundation and understanding which were reflected has least mastery. The competencies and skills are length measurements, number place value, number in words, operation on numbers, using fractions, percentage, decimals and ratios (Medina & Del Rosario, 2022). The researcher carefully studied and planned to put these identified competencies in the Video Tutorial Lessons he made using the 5W1H model. The VTL's served as the learning resources used by the students. The video tutorial lessons guided the Grade 8 students in mastering the numeracy skills needed. It is significant before going to a higher grade level knowing that the lessons are framed in a spiral approach. Furthermore, the students were able to play, pause and replay unlimitedly the video tutorial lessons as they study from their respective homes.

### Theoretical Framework

In this part, this study discussed the learning theory to guide the researcher's scientific understanding, explanation, and inference of the current research undertaking. The study is anchored to 5W1H Unified Integration Model. According to Akcil, et al. (2021), the focus of this model is on student learning, and it is based on analyzing and planning the process to increase learning of students. The components consist of why (reasons), what (purposes), how (modes), who (people), where (places), and when (sequence/timing).

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In making the video tutorial lessons, the researcher identified the reasons of making the video tutorial lessons such as what are the lesson objectives, how the lessons will be delivered, who are the persons involve in creating and validating the video tutorial lessons, where is the video tutorial lessons will be created and the place of the students and when making of the video tutorial lessons will be started and ended and the appropriate time for the students will access and watch the video tutorial lessons. The researcher followed steps in making the video tutorial lessons. First, he analyzed the scores of the non-numerate students in terms of mastered, nearing mastered and least mastered. Second, he identified the lessons and topics covered in the nearing mastered and least mastered elements of the numeracy skills. Then thirdly, the researcher planned how many videos will be made depending on the length of the topics. Fourth he used different kinds of resources like the internet as references for the topics and lessons. Fifth, researcher prepared lesson plans for the topics. Then sixth, the he planned and prepared the shooting of the video. Lastly, researcher recorded the video tutorial lesson. The quality or the level of acceptability of the designed video tutorial lessons were determined in terms of content and technical production. Lai, et al. (2016) claimed that video tutorials were created and made available as just-in-time support to enhance students' academic performance. It enriched students' learning experiences and enhanced their academic performance. They suggest that the learning benefits of the videos were instrumental to those students with average learning ability and those who struggled to understand the course materials during the class especially in their numeracy skills. Numeracy skills refers to the skills that deals with the computation of numbers of the learners in Mathematics. It includes the six components; measurement; calculating; patterns and relationships; rational, spatial and interpreting. The categorization of the mentioned competencies was crafted from Australian Curriculum (2021). These are competencies identified by the researcher aligned to Grade 8 Mathematics. Measurement is the numerical skills which refers to the size, length or amount of something in numbers. Calculating deals with the use of operations in computing and calculating numbers. Patterns and relationship deal with the identifying and spotting patterns and relations between numbers. Rational deals with the computation of numbers in fraction, decimal, percent, ratio and. Spatial skill deals with figures. Interpreting is the numerical skills that deals with the interpretation of statistical information. Moreover, in analyzing the numeracy skills needed, the researcher identified the academic needs of the Grade 8 students. The researcher was able to increase productivity of the lessons by preparing an objective to be organized. In addressing the numeracy skills parallel to the academic needs of the students, the researcher considered the lessons, the target students, the contents needed, the delivery of the lessons, and how it was delivered. Thus, the students were able to easily grasp the video tutorial lessons based on the students' learning needs. The theory and principle presented helped the researcher to arrive at the theoretical framework in conducting this study. The conceptual framework is summarized in the research paradigm presented below.

### Conceptual Framework

In the independent variable we have the learning related factors of the respondents which are the instructional resources, learning environment and guidance and support. The numeracy skills measured thru pre-test in terms of the six components; measurement, calculating, patterns and relationship, rational, spatial and interpreting. Video tutorial lessons (VTL's) was made using the 5W1H model in terms of content and technical production. While the dependent variables are the four components which were the focused of the study where in the respondents got least mastered.

### Statement of the Problem

This study attempted to use a video tutorial lesson in order to enhance the level of numeracy skills of Grade 8 students.

Specifically, it sought to answer the following questions:

1. How is the learning related factors received by the respondents in terms of:
  - 1.1 instructional resources;
  - 1.2 learning environment and;
  - 1.3 Parental support?
2. What is the level of numeracy skills of the Grade 8 students based on the pre-assessment results in terms of:
  - 2.1 measurement;
  - 2.2 calculating;
  - 2.3 patterns and relationships;
  - 2.4 rational;
  - 2.5 spatial and;
  - 2.6 Interpreting?
3. What is the level of acceptability of the quality of video tutorial lessons guided by 5W1H model in terms of:
  - 1.1 Content and;
  - 1.2 technical production?

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4. What is the level of numeracy skills of the Grade 8 students based on the post-assessment results in terms of:
  - 4.1 measurement;
  - 4.2 calculating;
  - 4.3 patterns and relationships; and
  - 4.4 Rational?
5. Is there a significant relationship between the learning related factors and the numeracy skills of the respondents?
  6. Is there a significant relationship between level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents?
  7. Is there a significant difference between the pre-assessment and post- assessment scores of the Grade 8 students after using the video tutorial lessons?

### Significance of the Study

The researcher believes that the result of the study will be beneficial to students, Mathematics teachers, school heads, and future researchers.

**Students.** Students' level of numeracy skills will be identified. They will be provided with appropriate learning material that will help them to cope with their difficulties and motivate them to study harder to overcome their weakness in Mathematics and improve their performance.

**Mathematics Teachers.** Teachers may use the result of the study as basis to identify the level of numeracy skills that need special attention in teaching their students. Data like scores in the tests may be used to identify students at risk and need remediation. The study is also helpful in planning and designing suitable video tutorial lessons guided by 5W1H model in teaching Mathematics that will fit the needs of every student in this time of COVID-19 pandemic.

**School Heads.** The result of the study may serve as the agent in improving instructional methods and identifying the needs of the students that triggered their difficulty in achieving good Mathematical skills. It may also help them plan appropriate interventions that will fit student's needs, especially to students with learning difficulty in Mathematics, and offer necessary instructional assistance like teacher trainings, seminars or workshops to uplift quality education.

**Future Researchers.** The present study can serve as a baseline data for future studies. It can also be a basis to explore other variables which will apply same method but in different learning areas.

### Scope and Limitation

The researcher determined the numerates and non-numerates in Grade 8 students and use video tutorial lessons guided by 5W1H model on non-numerate students. To identify the numerates and non-numerates in Grade 8 students there was an administration of standardized assessment tool of the DepEd Division of Quezon to 276 Grade 8 students in Castañas National High School, Sariaya East District, Quezon. The standardized assessment tool categorized the 40 items standardized questionnaire of the Division of Quezon into six components adopting the learning continuum of Australian Curriculum (2021). This is to determine on what element the non-numerate students struggle. The six components are the measurement, calculating, patterns and relationships; rational, spatial reasoning, and interpreting. There was an identification of the numeracy skills of the Grade 8 students so as to classify them as numerates and non-numerates. Numerate students are those who got a score of 50 to 100 percent of the total number of item while the non-numerate are those who got a score of 49 percent and below of the total number of items. Among the non-numerates, there was classifications of the level of mastery of the six components. Mastery Least (0% – 49%), Nearing Mastery (50% - 74%) and Mastery (75% - 100%) are the mastery level of the numeracy skills. Among the six components, measurement, calculating, patterns and relationships, and rational were the focused of this study. It is because based on the results, these components have the least mastery level. Video tutorial lessons were made using 5W1H model for the use of non-numerate students of each of the four sections in Grade 8 students respectively. There was a total of 44 non-numerate students as the respondents. The content of the video tutorial was composed of lessons from the four components of numeracy skills which are least mastered by the students based on the test results (pre-test) of the students which needs further enhancement. It was followed by the utilization of the video tutorial lessons among the 44 non-numerate students. Afterwards, post-test was administered among them. Furthermore, this study identified the learning related factors of the respondents in terms of instructional resources, learning environment and parental support. The level of acceptability of the designed video tutorial lessons were determined in terms of content and technical production. The researcher also determined if there is a significant relationship between the learning related factors and the numeracy skills of the respondents; if there a significant relationship between level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents; and if there a significant difference between the pre-test and post-test scores of the Grade 8 students after using the VTL's.

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## II. METHODS

This study utilized descriptive developmental method of research employing the single group pretest and posttest design. The initial phase of the study involved the identification of who are the numerates and non-numerates among the grade 8 students using the standardized assessment tool of the Division of Quezon. It was administered among Grade 8 students in Castañias National High School in December 2021. This was followed by the preparation of video tutorial lessons using 5W1H model to enhance the numeracy skills of the non-numerate students. The final phase involved descriptive developmental method. The 44 non-numerate students were given treatment using the video tutorial lessons. After the experimentation, the students were subjected to posttest to find out if there is a significance difference between the pretest and posttest results.

Research population was utilized for choosing the respondents for the identification of the numeracy skills from Grade 8 students. There was a total of 267 respondents from Castañias National High School officially enrolled in School Year 2021-2022. These respondents answered the standardized assessment tool of the DepEd Division of Quezon to identify the numerates and non-numerates in Grade 8. The identification of numerate and non-numerate students in this study was conducted in Castañias National High School, Sariaya East District.

From the identified non-numerates using purposive sampling, 44 Grade 8 students served as respondents for testing the effectiveness of the video tutorial lessons guided by 5W1H model. Non-numerates are those students who got score of below 50%. Meanwhile, three (3) master teachers in mathematics in Quezon province and two (2) experts from Laguna State Polytechnic University served as the respondents for the acceptability of the video tutorial lessons.

### RESEARCH INSTRUMENT

The following instruments were constructed and utilized in the conduct of this study:

- A. Standardized Assessment Tool. The standardized assessment tool served as the diagnostic test. It is a 40-item test adopted from the DepEd Division of Quezon to identify the numerates and non-numerates among the Grade 8 students.
- B. Video Tutorial Lessons (VTL's). The researcher made video tutorial lessons using 5W1H model based on the pre-test results of the non-numerate students. Then, the video tutorial lessons were used by the said students.

The researcher identified the topics covered in the video tutorial lessons. The result of the standardized assessment tool served as the basis for identifying the topics to be included in the video tutorial lessons. The items in standardized 40-item questionnaire were categorized as measurement; calculating, patterns and relationships, rational, spatial and interpreting.

The researcher visited the library, searched in the internet, read textbook and other related articles, and browsed the K 12 Mathematics module to gather information about the topic and making of video tutorial lessons. The video tutorial lesson has a brief explanation and preview of the topics included; defines the tasks that the learners need to undertake in order to develop the necessary skill which will help the learner measure his/her level of mastery at the end of the task.

The researcher consulted first his adviser for comments and suggestions. Initial revision was done after the consultation. Experts in the field of Mathematics were also consulted. Their comments were considered as basis for final revision and validation of the video tutorial lessons.

- C. Questionnaire on the Level of Acceptability of the Video Tutorial Lessons Guided by 5W1H model. The 4-point Likert Scale adopted from the study of Ali, et al. (2017) entitled "Instructional Video Evaluation Instrument" was utilized to determine the level of acceptability of the quality of video tutorial lesson. It was composed of 15 statements with four descriptive rating such as not acceptable, fairly acceptable, acceptable and highly acceptable. It was evaluated in terms of content and technical production. There were ten statements (10) for content and five (5) statements for technical production.

### RESEARCH PROCEDURE

Upon the approval of the Oral Examination Committee, the researcher handed a letter of request to conduct the study to the Schools Division Superintendent (SDS) of the DepEd - Division of Quezon, Public Schools District Supervisor (PSDS) of Sariaya East District and to the school head of Castañias National High School. Afterwards, with the informed consent of the SDS, PSDS and the school head, Grade 8 advisers of Castañias National High School were informed regarding the administration of the questionnaire. For the first phase of data gathering procedure, the researcher collected the previous numeracy test result of grade 8 which was administered in December, 2021. Numeracy test is administered in school in all grade levels every year as instructed by DepEd division of Quezon using the standardized test. After gathering the necessary data, appropriate statistical treatment was applied and results will be presented, analyzed, and interpreted. Based from result of the standardized assessment tool for numeracy skills, the non-numerate students were identified. Using the result, the researcher started making the video tutorial lessons using the 5W1H model. Second phase of data gathering procedure involved investigating the effectiveness of the quality of video tutorial lessons made by the researcher. The researcher secured permission from the school heads and district supervisor for the validation of the video tutorial lessons by the forty-four (44) respondents, three (3) master teachers in mathematics in Quezon province and two (2) experts from Laguna State Polytechnic University. The acceptability of the material was determined with the use of a 12-

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item questionnaire for the respondents and 15-item for the experts in a 4-point Likert Scale. The acceptability of the material was determined in terms of content and technical production. The researcher approached the experts through personal and through the use of smart phone to answer the questionnaire for the acceptability of the material on February, 2022. Before the administration of the video tutorial lessons to the respondents, orientation to their parents or guardian are conducted to make sure that the parents or guardians of the respondents will be aware of the activity where in their children will be involved and also for the assurance that they will give support and cooperate with the said activity. The administration of the video tutorial lesson lasted from March to April, 2022. The 44 Grade 8 students used the video tutorial lessons in accordance to the weekly home learning plan. The researcher coordinated with the student together with their parents or guardian to monitor and assure that the respondents will watch the video properly and on time. For the third phase of data gathering procedure, post-test for 44 Grade 8 students were administered in May, 2022. Scores were tallied, tabulated and analyzed to identify the significant difference between the pre-test and post-test of the 44 Grade 8 students. Moreover, the researcher also determined the learning related factors of the respondents in terms of instructional resources, learning environment and parental support. The researcher identified if there is a significant relationship between the learning related factors and the numeracy skills of the respondents; and if there is a significant relationship between the level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents.

### III. RESULTS

**Table 5. Learning related Factors in terms of Instructional Resources**

Available Learning Resources at home	Frequency	Percent
1. Printed module	38	86%
2. Mathematics textbook	24	55%
3. Basic cellphone	11	25%
4. Touchscreen cellphone	31	70%
5. Tablet	4	9%
6. Computer	3	7%
7. Internet	11	25%
8. Television	26	59%

The table shows the instructional resources that are available to use by the respondents in Castañás National High School. There were 44 students who answered the questionnaire. Printed module got the Rank 1 with a frequency of 38 or 86%. It is followed by touchscreen cellphone as Rank 2 with a frequency of 31 or 70%. Lastly, it is followed by television with a frequency of 26 or 59%.

**Table 6. Learning related Factors in terms of Learning Environment**

The place where I study and answer my printed module is:	Mean	Std. Deviation	Interpretation
1. well lighten	2.75	1.10	Good
2. quiet enough	2.55	1.11	Good
3. free from destruction	2.75	1.12	Good
4. has proper ventilation	2.36	1.22	Poor
5. I am comfortable enough where I do my studies and answering my printed module	2.77	1.27	Good
Mean	2.64	0.73	Good

*3.25 – 4.00 – Very good*

*2.50 – 3.24 – Good*

*1.75 – 2.49 – Poor*

*1.00 – 1.74 – Very poor*

The table shows the learning environment of the respondents in Castañás National High School. It got an overall mean of 2.64 with an interpretation of “good.” “I am comfortable enough where I do my studies and answer my printed module” got the highest



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mean of 2.77 with an interpretation of “good.” It is followed by well lighten, free from destruction and quiet enough obtained a mean ranging from 2.55 to 2.75, all having an interpretation of “good.”

**Table 7. Learning related Factors in terms of Parental Support**

	Mean	Std. Deviation	Interpretation
1. get my printed modules from the school on time and check them	2.73	1.15	Good
2. provide me what I need in answering my printed modules (like bond/graphing/ pad paper etc.)	2.84	1.01	Good
3. help me in answering my printed modules	2.27	0.90	Poor
4. monitor and check if I do my activities properly, correctly and completely.	2.25	1.12	Poor
5. check and submit to school my answered printed module on time	2.82	1.23	Good
Mean	2.58	0.66	Good

3.25 – 4.00 – Very good

2.50 – 3.24 – Good

1.75 – 2.49 – Poor

1.00 – 1.74 – Very poor

The table presents the parental support that the respondents in Castañás National High School gets in their studies in answering their printed module. It obtained an overall mean of 2.58 with an interpretation of “good.” Based on the answers of the respondents, in terms help or support they get at home is not what they are expecting and not that enough for their studies. It is also heard in the story of many parents or guardians of the students or even the students themselves during some of our conversations through cellphones and even in person in times of module distribution and retrieval saying that their parents sometimes don’t have time to get their printed module in school on time and to check, monitor and submit to school because they are too busy in their work like fishing. Some of them also wanted to help answering their children in their studies but what they can do? they don’t even know how to read correctly or they don’t understand what is the printed module saying. “Provide me what I need in answering my printed modules” got the highest mean of 2.84 with an interpretation of “good.” It is followed by “get my printed modules from the school on time and check them” and “check and submit to school my answered printed module on time” got the mean ranging from 2.73 to 2.82, both with an interpretation of “good.”

**Table 8. Pre-test Numeracy Skills of the Respondents**

Score Range	Measurement		Calculating		Patterns and Relationships		Rational		Spatial		Interpreting		Interpretation
	F	%	F	%	F	%	F	%	F	%	F	%	
75% -100%	--	--	--	--	--	--	--	--	30	68	30	68	Mastery
51% - 74%	--	--	--	--	--	--	--	--	14	32	14	32	Nearing Mastery
0% - 50%	44	100	44	100	44	100	44	100	--	--	--	--	Least Mastered
TOTAL	44	100	44	100	44	100	44	100	44	100	44	100	

The table shows the pre – assessment results in the numeracy skills. First, it shows in the column of the component of measurement that 44 (100%) or all of them fall on least mastered index. It has a mean of 25.42 percent with an SD of 8.28. Based on the scores of the respondents their mastery in measurement is not that good specially in computation of measurement like length. Even the basic like simple units use in measurements, some of them don’t clearly understand it. It means that no one among them is on the nearly mastered or mastered index in this component. It means that the respondents need a teacher’s intervention like the use of 5W1H based video tutorial lesson to improve their academic performance in terms of measurement.

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Second, it shows in the column of calculating that 44 (100%) or all of them fall on least mastered index. It has a mean of 24.81 percent with an SD of 7.83. They were considered as non-numerates in this aspect. This indicates that none of them are on the mastery or nearing mastery index for this component. Based on the answers and scores of the respondents, they can hardly understand the concepts in calculating such as place value and number in words. Based also on the results, many of them are good in operation on numbers but when it comes to a more complex questions, they become confused with it. Even in word problems they having a hard time getting the answer. It implies that for the respondents' academic performance to improve in terms of calculating, a teacher's involvement is required, such as the usage of a video tutorial lessons guided by 5W1H model. Thirdly, it demonstrates in the column of patterns and relationships that 44 of them, or all of them, fall under the least-mastered index. It has a mean of 25.63 percent with an SD of 8.13. This shows that none of them are on the index of mastery or nearing mastery for this component. Based on the answers and scores of the respondents, many of them are having difficulties in arranging decimals and fractions from lowest to highest. They are considered as non-numerates. It suggests that instructor engagement, such as utilization of video tutorial sessions guided by 5W1H model is necessary for the respondents' academic performance to improve in terms of patterns and relationships. Fourthly, it reveals in the column of rational that 44 of them, or all of them, fall under the category of least mastered. It has a mean of 24.81 percent with an SD of 9.08. This means that none of them are included on the index of people who have achieved or almost mastered this component. Based on the results, indicates that in terms of rational, the respondents' performance in solving mathematics problems involving fractions, percentage, decimals and ratios is low. They are non-numerates on this part. It means that a teacher's engagement is necessary for the respondents' academic performance to improve in terms of rational, such as through the use of video tutorial sessions. Fifthly, it shows in the column of spatial that 30 or 68% of them fall on mastery index and 14 or 32% are on nearing mastery. It has a mean of 81.11 percent with an SD of 7.38. Based on the answers of the respondents on the pretest, they are very good when it comes to identifying, classifying and organizing figures. It indicates that none of them are on the component's least-mastered index that is why this is not the focus of the study. Then finally, it reveals in the column of interpreting that 14 or 32% of them are reaching mastery and that 30 or 68 percent of them fall under the mastery index. It has a mean of 80.42 percent with an SD of 9.13. Based on the answers of the respondents on the pretest, they are very good when it comes to identifying, classifying and organizing data such as temperature, weather report and the like. It means that none of them are included on the index of the component with the least mastery that is why it is not the focus of the study.

**Table 9. Respondents' level of acceptability of the quality of the Video Tutorial Lessons in terms of the content**

	Mean	Std. Deviation	Interpretation
1. I am motivated watching the video.	3.75	0.44	HA
2. The video lesson will help me answering my activities in mathematics	3.75	0.44	HA
3. The video lesson will help me for better understanding the topic	3.82	0.39	HA
4. The video lesson gave me new understanding that I don't have before about the topic.	3.84	0.37	HA
5. The video lesson gave me more confidence about the topic	3.86	0.35	HA
6. I clearly understand the discussion	3.82	0.39	HA
Mean	3.81	0.11	HA

3.25 – 4.00 - *Highly acceptable (SA)*

2.50 – 3.24 – *Acceptable (A)*

1.75 – 2.49 – *Slightly acceptable (LA)*

1.00 – 1.74 – *Not Acceptable (NA)*

The table shows the level of acceptability of the students on the quality of the video tutorial lessons in terms of its content. It obtained an overall mean of 3.81 with an interpretation of "highly acceptable." It means that the respondents like the quality of the video in terms of content. It is because the videos gave them more confidence about the topic. It provides them new understanding that they do not have before. They clearly understand the discussion because of the simplified terms used by the teacher. Considering the overall SD result of 0.11, it means that the responses of the respondents did not quite differ from the others. Thus, it depicts that the video tutorial lesson is highly acceptable to all of them. "The video lesson gave me more confidence about the topic" got the highest mean of 3.86 with an interpretation of "highly acceptable." It is followed by "the video lesson

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gave me new understanding that I don't have before about the topic" garnering a mean of 3.84 with an interpretation of "highly acceptable." Then, it was followed by "the video lesson will help me for better understanding the topic" and "I clearly understand the discussion," both with a mean score of 3.82 with an interpretation of "highly acceptable."

**Table 10. Experts' level of acceptability of the quality of the Video Tutoria Lesson in terms of the content**

	Mean	Std. Deviation	Interpretation
1. The content of the video is accurate and up-to-date.	4.00	0.00	HA
2. The content of the video is generally useful. It stimulates, motivate and inform the learner to act on the information that was being presented	3.80	0.45	HA
3. The video is bias-free, including stereotyping with regard to age, sex, ethnicity, race, physical impairment, values, dress, language or social class.	3.80	0.45	HA
4. The video begins with motivating introduction to stimulate interest. The objectives or key elements made clear in the introduction	4.00	0.00	HA
5. The content detail controlled to promote understanding. The video simplifies complex tasks and avoid introducing extraneous information. It does not cover too much material or introduce too much detail	3.80	0.45	HA
6. The video suggests methods for the learner to apply the newly acquired knowledge. The suggestions for practice of what's being discussed was considered	3.60	0.55	HA
7. The video allows for learner reflection	3.60	0.55	HA
8. The video meets the learning objectives and needs of the learner. The video visually depicted fit the learning objectives.	4.00	0.00	HA
9. The video is conducive to learner interaction	4.00	0.00	HA
10. The video can be easily integrated into the learning environment by adding emphasis to or supplementing more traditional methods. The video brings remote experiences and places to the learner.	4.00	0.00	HA
Mean	3.84	0.05	HA

3.25 – 4.00 - *Highly acceptable (SA)*

2.50 – 3.24 – *Acceptable (A)*

1.75 – 2.49 – *Slightly acceptable (LA)*

1.00 – 1.74 – *Not Acceptable (NA)*

The table shows the level of acceptability of the experts on the quality of the video tutorial lessons in terms of its content. It obtained an overall mean of 3.84 with an interpretation of "highly acceptable." It means that the experts like the quality of the video in terms of content. It is because the videos are accurate and up-to-date. It is motivating and interactive. It meets the learning objectives and address the needs of the students. "The video meets the learning objectives and needs of the learner; the video visually depicted fit the learning objectives," the video is conducive to learner interaction," "the video can be easily integrated into the learning environment by adding emphasis to or supplementing more traditional methods; the video brings remote experiences and places to the learner," "the content of the video is accurate and up-to-date," and "the video begins with motivating introduction to stimulate interest; the objectives or key elements made clear in the introduction" got the highest mean of 4.00, all with an interpretation of "highly acceptable."

**Table 11. Respondents' level of acceptability of the quality of the Video Tutorial Lesson in terms of the Technical Production**

	Mean	Std. Deviation	Interpretation
1. The brightness of the video is good enough	4.00	0.00	HA
2. The quality of the audio is clear enough for better understanding.	3.86	0.35	HA

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3. The size and style of the fonts are good enough to read and understand.	3.86	0.35	HA
4. There is no background noise that destructs me from watching the video lesson.	3.82	0.39	HA
5. The music and sound is enough to catch my interest to keep watching the video lesson.	3.73	0.45	HA
6. The speed of the narration is slow enough to be understood	3.75	0.44	HA
Mean	3.83	0.15	HA

3.25 – 4.00 - *Highly acceptable (SA)*

2.50 – 3.24 – *Acceptable (A)*

1.75 – 2.49 – *Slightly acceptable (LA)*

1.00 – 1.74 – *Not Acceptable (NA)*

The table shows the level of acceptability of the students on the quality of the video tutorial lessons in terms of its technical production. It obtained an overall mean of 3.83 with an interpretation of “highly acceptable.” It means that the respondents like the quality of the video in terms of technical production. It is because of the quality of the videos. It has good brightness, the audio is clear, the size and style of the fonts are good and there is no unnecessary noise in the video. “The brightness of the video is good enough” got the highest mean of 3.86 with an interpretation of “highly acceptable.” It is followed by “the quality of the audio is clear enough for better understanding” and “the size and style of the fonts are good enough to read and understand,” both got the mean of 3.86 with an interpretation of “highly acceptable.” Then, it was followed by “There is no background noise that destructs me from watching the video lesson” obtaining a mean score of 3.82 with an interpretation of “highly acceptable.”

**Table 12. Experts’ level of acceptability of the quality of the Video Tutorial Lesson in terms of the Technical Production**

	Mean	Std. Deviation	Interpretation
1. The video is well-planned, organized, and structured. The technology is transparent and non-threatening to the learner. The video demonstrates its ability to transcend space and time.	4.00	0.00	HA
2. The video avoids content not related to the subject matter stated in the introduction	3.80	0.45	HA
3. The camera is looking at the scene from the learners’ point of view. The scene changes appear to be appropriate.	3.80	0.45	HA
4. The vocabulary of the narration is appropriate for the intended audience. The speed of the narration is slow enough to be understood. The music fits for the visual effects or audio narration. The background noises used are conducive for learning. The sound effects used to add emphasis to the visual tract of a video to enhance learning.	4.00	0.00	HA
5. The audio-visual is combined well. There are variety of differing types of sounds and visuals to attract and hold attention.	3.80	0.45	HA
Mean	3.88	0.11	HA

3.25 – 4.00 - *Highly acceptable (SA)*

2.50 – 3.24 – *Acceptable (A)*

1.75 – 2.49 – *Slightly acceptable (LA)*

1.00 – 1.74 – *Not Acceptable (NA)*

The table shows the level of acceptability of the experts on the quality of the video tutorial lessons in terms of its technical production. It obtained an overall mean of 3.88 with an interpretation of “highly acceptable.” It means that the experts like the quality of the video in terms of technical production. The videos' high quality is the reason. There is no extraneous noise in the movie, nice brightness, clear audio, decent text size, and good font style. “The video is well-planned, organized, and structured; the technology is transparent and non-threatening to the learner; the video demonstrates its ability to transcend space and time” and “the vocabulary of the narration is appropriate for the intended audience; the speed of the narration is slow enough to be

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understood; the music fits for the visual effects or audio narration; the background noises used are conducive for learning; the sound effects used to add emphasis to the visual tract of a video to enhance learning” got the highest mean of 4.00, both with an interpretation of “highly acceptable.”

**Table 13. Post-test Numeracy Skills of the Respondents**

Score Range	Measurement		Calculating		Patterns and Relationships		Rational		Interpretation
	F	%	F	%	%	F	F	%	
75% -100%	20	45	27	61	28	64	19	43	Mastery
51% - 74%	24	55	17	39	16	36	25	57	Nearing Mastery
0% - 50%	--	--	--	--	--	--	--	--	Least Mastered
TOTAL	44	100	44	100	44	100	44	100	

The table shows the post – assessment results in numeracy skills. First, it shows in the column of measurement that 20 or 45% of them fall on mastery index and 24 or 55% are on nearing mastery. It has a mean of 78.34 percent with an SD of 8.12. It means that no one among them is on the least mastered index in this component. It means that students watching the VTL’s made by the teacher using 5W1H model can enhance the respondents' performance in terms of measurement. They can now understand the concepts of length measurement. Based on the results watching the VTL’s they can now also convert from one unit into other units of measurement. Secondly, it shows in the column of calculating that 27 or 61% of them fall on mastery index and 17 or 39% are on nearing mastery. It has a mean of 80.06 percent with an SD of 7.23. It means that no one among them is on the least mastered index in this component. It means that students watching the VTL’s made by the teacher using 5W1H model can enhance the respondents' performance in terms of calculating. They can now understand the concepts in calculating such as place value and number in words. Based on the results watching the VTL’s they can now also use operations on numbers in words correctly. Thirdly, it shows in the column of patterns and relationships that 28 or 64% of them fall on mastery index and 16 or 36% are on nearing mastery. It has a mean of 79.43 percent with an SD of 8.67. It indicates that none of them are on the component's least-mastered index. This indicates that, in terms of patterns and relationships, students watching the VTL’s made by the teacher using 5W1H model can enhance the respondents' performance in terms of patterns and relationships. They can now understand the concepts of patterns and relationships on numbers in decimals and fractions. Based on the results watching the VTL’s they can now solve word problems using decimal and fractions. Then finally, it shows that 19 or 43% of them fall on mastery index and 25 or 57% are on nearing mastery. It has a mean of 78.86 percent with an SD of 6.83. It indicates that none of them are on the component's least-mastered index. Based on the results, indicates that in terms of rational, students watching the VTL’s made by the teacher using 5W1H model can enhance the respondents' performance in solving mathematics problems involving fractions, percentage, decimals and ratios as there is no more non-numerates on this aspect. The data suggests that using video instructional session on those four components particularly like this one which was made using 5W1H model needs to be continued. It is to assist the other left to reach the mastery level. The advantage of the VTL’s is that the respondents may view it again and again. Using videos instead of only printed materials results in a more interesting sensory experience. They offer a convenient source that is accessible from anywhere. Videos aid with memory recall. They are a huge help in studying all topics, especially arithmetic concepts. They improve communication and computer literacy skills (Next Thought Studios, 2020). Both the 5W1H model and the Video tutorial lessons had helped the students in increasing their numeracy skills. The researcher helped by the model in making the VTL’s which had helped the students in increasing their performance in mathematics. Brame (2017) claimed that video tutorial lessons provided significant means to improve students’ numerical skills. Carmichael, et al. (2018) claimed that shorter videos can increase median viewing times for videos, can improve learning outcomes and the likelihood that repeat usage will occur.

**Table 14. Significant relationship between the learning related factors and the numeracy skills of the respondents**

Learning related factors	Least Mastered Numeracy Skills			
	Measurement	Calculating	Patterns and relationships	Rational
Instructional resources	.050	-.023	.025	.078
Learning environment	-.166	.003	.185	-.226
Parental support	.107	.076	.018	.031

*\*The difference is significant at 0.05 level*

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This table shows the significant relationship between the learning related factors and the least mastered numeracy skills of the respondents. The data revealed in the learning related factors and the least mastered numeracy skills of the respondents is not significant at 0.05 level. Thus, the researcher accepted the null hypothesis. It means that there is no significant relationship between the learning related factors and the least mastered numeracy skills of the respondents. The data implied that the data of learning related factors and the least mastered numeracy skills of the respondents do not have any relation at all. They are independent variables which do not affect each other. It means that the teacher may focus on their intervention such as the utilization of video tutorial lessons to improve the least mastered competencies of the respondents in particular to measurement, calculating, patterns and relationships, and rational.

**Table 15. Significant relationship between level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents**

Quality of Video Tutorial Lessons	Least Mastered Numeracy Skills			
	Measurement	Calculating	Patterns and relationships	Rational
Content	-.160	.156	.252	.039
Technical Production	.116	-.019	.095	.237

This table shows the significant relationship between the level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents. The data revealed in the content and technical production is not significant at 0.05 level. Thus, the researcher accepted the null hypothesis. It means that the level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents is not significantly correlated. The data implied that the data of level of acceptability of the respondents and the experts do not have any relation at all. They are independent type of evaluator on level of acceptability which does not affect each other though it was revealed in Table 10 to 13 that the respondents and experts strongly accepted the quality of video tutorial lessons in terms of content and technical production.

**Table 16. Significant difference between the pretest and posttest scores of the Grade 8 students after using the video tutorial lessons**

Numeracy Skills	Pretest		Posttest		t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Mean	Std. Deviation			
Measurement	28.64	7.21	76.98	12.36	-22.001	43	.000
Calculating	34.45	5.86	78.73	14.72	-18.919	43	.000
Patterns and relationships	30.75	9.19	76.98	13.52	-19.961	43	.000
Rational	26.36	10.14	74.77	13.38	-19.731	43	.000

*\*The difference is significant at 0.05 level*

The table shows the significant difference between the pretest and posttest scores of the Grade 8 students after using the video tutorial lessons. All the numeracy skills in terms of measurement, calculating, patterns and relationships and rational got a t-value of 18.919 to 22.001 greater than the 0.05 significance level. Thus, the researcher rejected the null hypothesis. It means that the pretest and posttest scores of the Grade 8 students after using the video tutorial lessons is significantly different.

It is evident from the pretest result that the respondents got a level of least mastered in Table 10 to 13. Then, they got a level of nearing mastery to mastery level in the posttest result revealed in Table 19 to 22. Moreover, it is also shown in the mean scores of the pretest in terms of measurement, calculating, patterns and relationships and rational got 26.36 to 34.45 which got higher during the posttest having a mean score of 74.77 to 78.73.

## IV. DISCUSSION

The researcher determined the numerates and non-numerates in Grade 8 students and use video tutorial lessons guided by 5W1H model on non-numerate students. There was an administration of standardized assessment tool of the Division of Quezon to 276



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Grade 8 students in Castañás National High School, Sariaya East District, Quezon. The standardized assessment tool categorized the 40 items standardized questionnaire of the Division of Quezon into six elements adopting the learning continuum of Australian Curriculum (2021). The six elements are the measurement, calculating, patterns and relationships; rational, spatial reasoning, and interpreting. Among the non-numerates, there was classifications of the level of mastery of the six elements. Mastery Least (0% – 49%), Nearing Mastery (50% - 74%) and Mastery (75% - 100%) are the mastery level of the numeracy skills. Among the six elements, measurement, calculating, patterns and relationships, and rational were the focused of this study. Video tutorial lessons were made for the use of non-numerate students of each of the four sections in Grade 8 students respectively. There was a total of 44 non-numerate students as the respondents. It was followed by the utilization of the video tutorial lessons among the 44 non-numerate students. Afterwards, post-test was administered among them. Furthermore, this study identified the learning related factors of the respondents in terms of instructional resources, learning environment and parental support. The level of acceptability of the designed video tutorial lessons were determined in terms of content and technical production. The researcher also determined if there is a significant relationship between the learning related factors and the least mastered numeracy skills of the respondents; if there a significant relationship between level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents; and if there a significant difference between the pre-test and post-test scores of the Grade 8 students after using the video tutorial lessons.

The top three instructional resources of the respondents were printed module, touchscreen cellphone and television. The respondents answered that learning environment and parental supports is a good as their learning related factors. In the pretest assessment result, the respondents do not have mastery in measurement, calculating, patterns and relationships, and rational. They ranged from nearing mastery to mastery level in spatial and interpreting. The level of acceptability of the respondents and experts on the quality of video tutorial lessons guided by 5W1H model in terms of content and technical production. The level of numeracy skills of the Grade 8 students based on the post-assessment results range from nearing mastery to mastery in terms of measurement, calculating, patterns and relationships, and rational. There is no significant relationship between the learning related factors and the numeracy skills of the respondents. There is no significant relationship between level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents. There is a significant difference between the pretest and posttest scores of the Grade 8 students after using the video tutorial lessons. Based on the findings and conclusions made, the following recommendations are hereby offered; first for the school administrators, they may continuously encourage the teachers to address the numeracy skills of the students in mathematics using the standardized assessment tool of the Division of Quezon. They may adopt the utilization of the video tutorial lessons specifically designed for Grade 8 students. Second for the teachers they may adopt the video tutorial lessons, the output of this study, to improve the numeracy skills of the Grade 8 students in terms of measurement, calculating, patterns and relationships, rational, spatial and interpreting. They may also use this in other grade level whenever it is applicable for any intervention or enrichment activities. Then lastly for future researchers, that another research be conducted involving a much wider population in terms of experimentation and acceptability of the material. Also, to utilize different research design such as mixed method (qualitative-quantitative approach) to further strengthen the findings of the study.

The findings revealed that the personal related factors for instructional resources of the respondents were printed module, touchscreen cellphone and television. The respondents replied that learning environment and parental supports is good as their personal related factors. In the pretest result, the respondents do not have mastery in measurement, calculating, patterns and relationships, and rational. On the other hand, they ranged from nearing mastery to mastery level in spatial and interpreting. Further, the level of acceptability of the respondents and experts on the quality of VTL's using 5W1H model in terms of content and technical production. It improves the level of numeracy skills of the Grade 8 students based on the post-assessment results range from nearing mastery to mastery in terms of measurement, calculating, patterns and relationships, and rational. Moreover, there is no significant relationship between the personal related factors and the numeracy skills of the respondents. There is no significant relationship between level of acceptability of the quality of video tutorial lessons and the numeracy skills of the respondents. Lastly, there is a significant difference between the pretest and posttest scores of the Grade 8 students after using the video tutorial lessons.

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## Social Support as a Predictor of Athletes Achievement Motivation: A Correlation Study at the Glagah Wangi Demak Athletic Club



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**ABSTRACT:** Social support is one of the factors that influence achievement motivation. Social support received can make individuals feel calm, cared for, self-confident, and competent. This study aims to determine the effect of social support on achievement motivation in athletic athletes. The type of research is ex post facto. The population is the athletics athletes of the Glagah Wangi Demak athletic club totaling 37 athletes with an age range of 14-19 years. The instrument in this research is a questionnaire. Data analysis using a simple regression test. The results showed that there was a significant effect of social support on the achievement motivation of athletic athletes. The contribution of social support to achievement motivation in athletic athletes is 27.90%. The better the athlete's social support, the higher the achievement motivation. It is hoped that people around athletes, such as parents, coaches, and friends, will provide the support that can help athletes so that they have a positive impact on their achievements. Athletes must maintain and develop enthusiasm while undergoing the best possible training program. Parents always encourage their children and provide good infrastructure to support children's achievements.

**KEYWORDS:** social support, achievement motivation.

### INTRODUCTION

The rise and fall of the achievements of the athletes show that there are certain factors that affect the achievements of athletes in competitions. The performance of athletes in a championship is influenced by many factors, one of which is the mental factor. Loehr (Benítez-Sillero et al., 2021) concluded that both coaches and athletes reported that at least 50% of success was influenced by psychological factors related to mental processes. In addition, (Gucciardi et al., 2017) show that in terms of strength, skill, and will to win, 90% of the critical success factors depend on mental aspects. Strictly speaking Gould et al. (Benítez-Sillero et al., 2021) also say that 82% of coaches state that mental strength is a determining factor in achieving sporting success. One of the factors that can affect achievement is the motivation factor. The role of motivation itself can foster a desire so that later it can lead to enthusiasm in practicing.

Motivation is the basis of all achievement sports (Mudrak et al., 2018); (Blynova et al., 2020). Without determination and a strong desire to improve performance, all mental factors such as belief, intensity, focus, and emotion, will all be meaningless. The reason that motivation is so important is that the only thing contributing to sports performance is self-control (Kaur et al., 2020). An important motivation for athletes is achievement motivation. Achievement motivation is a power in the human mind to carry out an activity that is better, faster, more effective, and more efficient than the activities carried out previously (Werdiastutie et al., 2020). Achievement motivation in sports is referred to as competitiveness (van de Pol et al., 2020), meaning that individuals with achievement motivation will be able to do a task or job well, be responsible for the tasks they do, and try to do tasks better than others.

During the training process until the match, many problems arise that can affect the athlete's motivation in training. Several things can affect achievement motivation in athletes, for example, lack of self-confidence, boredom, and lack of love for the team. This lack of love in the team can occur when a member has lower abilities than friends who are on the same team. Frequent disputes between team members are also one of the factors that decrease achievement motivation in athletes.

Based on observations at the Glagah Wangi Demak athletic club, there have been several problems that have occurred in recent years, including some athletes who lack motivation and lack of support from the surrounding environment. Based on an explanation from one of the trainers who explained that there were some athletes who were still indifferent if one of their friends



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did not participate in joint training. Facts that occur in the field there are also several problems related to psychological conditions. This problem becomes an obstacle for athletes to exercise routinely, which is their obligation. The problems mentioned above are examples of problems that can affect the achievement motivation of athletes, which are also related to social support. Similar to achievement motivation, social support can be obtained from people in the surrounding environment, such as parents, fellow athletes, and coaches.

Social support is an effort to provide comfort to others, care for them, and appreciate them. Social support is an interpersonal transaction shown by assisting other individuals, and that assistance is obtained from people who are meaningful to the individual concerned (Liu et al., 2020); (Mishra, 2020). Social support includes emotional support, encouragement to express feelings, giving advice or information, and material assistance (Hu et al., 2019). Aspects of social support are emotional support, instrumental support, informational support, and friendship support (Nick et al., 2018); (Moeini et al., 2018); (Kjellstrand et al., 2022). Support from the family in the form of acceptance, attention, and trust will cause individuals to be motivated to keep trying to achieve their goals. So, it can be seen that family social support influences the achievement motivation of athletes. An athlete certainly needs help to support his training to achieve optimal results. The results of the study show that there is a positive relationship between parental social support and sports achievement motivation (Reer & Krämer, 2019); (Stanger et al., 2018); (Bakadorova et al., 2019). The social support received by athletes, especially social support from the coach, can influence the athlete's physical and psychological recovery for injured athletes.

### METHODS

The type of research is descriptive quantitative with ex post facto. Ex post facto is research conducted to examine an event that has occurred and then look back to find out the factors that can cause the incident. The population in this study were athletes at the Glagah Wangi Demak athletic club, totaling 37 athletes with an age range of 14-19 years. The questionnaire to measure social support was developed from the forms of social support proposed by Smet (1994) with a reliability of 0.822 (Simunati et al., 2021). The questionnaire to measure achievement motivation was developed from the characteristics of highly motivated individuals proposed by McClelland (Brunstein & Heckhausen, 2018) with a reliability of 0.858. The instrument grid is in Table 1:

**Table 1. Instrument Grid**

Variable	Aspect	Indicator
Social Support	Emotional Support	Includes warmth and involves emotions between the individual. Behaviors such as giving attention and affection are a reflection of emotional support.
	Instrumental Support	Is a form of direct assistance given to individuals, for example helping to complete certain tasks, financial assistance
	Information Support	Includes giving advice, providing feedback on how to solve a problem
	Friendship Support	It includes the availability of other people to spend time with so that a sense of membership in a group that has social interests and activities arises.
Achievement Motivation	Responsibility	Able to accept the risk of everything he does. Carry out tasks and obligations to completion
	Creative	Using the latest ways of doing tasks
	Score	Determine the standards to be achieved in carrying out tasks or obligations
	Spirit	Individuals have high aspirations. Trying to get new information

Data analysis techniques include descriptive analysis, prerequisite tests (normality and linearity tests), hypothesis testing using simple regression tests, and coefficients of determination. Analysis using SPSS 23 software.

### HASIL

The results of the statistical descriptive analysis of social support and achievement motivation of athletic athletes are presented in Table 2:



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**Table 2. Statistical Descriptive Analysis Results**

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Social Support	37	44,00	55,00	48,81	2,86
Achievement motivation	37	25,00	34,00	29,24	2,55

Based on Table 3, it shows that social support has an average of 48.81, these results indicate that social support is in a low category. Achievement motivation has an average of 29.24, this result shows that achievement motivation is in a low category. The data normality test used the Shapiro-Wilk method, the results are in Table 3:

**Table 3. Normality Test Analysis Results**

Variable	Shapiro-Wilk		
	Statistic	df	Sig.
Social Support (X)	0,971	37	0,446
Achievement motivation (Y)	0,943	37	0,157

Based on the statistical analysis of the normality test that has been carried out using the Shapiro-Wilk test, the variables of Social Support (X) and Achievement Motivation (Y) obtained normality test results with a significance value of  $p > 0.05$ , which means the data is normally distributed.

Linearity test data in this study used the ANOVA method, the results are in Table 4:

**Table 4. Linearity Test Analysis Results**

Variable	ANOVA Table		
	Mean Square	F	Sig.
Achievement Motivation (Y) * Social Support (X)	2,950	0,528	0,854

From Table 15 above, it can be seen that the relationship between Social Support (X) and Achievement Motivation (Y) has a significance value ( $p$ )  $> 0.05$ . So, the relationship between the independent variable and the dependent variable is stated to be linear.

The results of a simple linear analysis of social support and achievement motivation of athletic athletes are presented in Table 5:

**Table 5. Linear Regression Analysis Results**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6,190	6,275		0,986	0,331
	Self-Efficacy	0,472	0,128	0,528	3,680	0,001

a, Dependent Variable: Achievement Motivation (Y)

Based on Table 5 above, it can be determined a simple linear regression equation as follows:

$$\text{Achievement Motivation (Y)} = 6.190 + 0.472 \text{ Social Support (X)}$$

The results of the interpretation of the simple regression equation above are as follows:

- The constant is 6.190, which means that if the social support variable (X) is equal to zero, then the achievement motivation variable (Y) is only 6.190.
- The regression coefficient for social support (X) is 0.472, which means that if social support (X) increases, achievement motivation (Y) will decrease by 0.472.

Based on the results of the analysis, it can be seen that the t-count value is 3.680 and a significance of  $0.001 < 0.05$ , then  $H_0$  is rejected, meaning "there is a significant effect of social support on the achievement motivation of athletic athletes". The regression

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coefficient is positive, meaning that if the athlete has high social support, the achievement motivation will be higher.

The coefficient of determination ( $R^2$ ) of the influence of social support and achievement motivation in athletic athletes is shown in Table 6.

**Table 6. The Result of the Coefficient of Determination**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,528 <sup>a</sup>	0,279	0,258	2,19936
a. Predictors: (Constant), Social Support (X)				

The value of the coefficient of determination R Square or social support (X) in explaining or predicting the achievement motivation variable (Y) is 0.279 or 27.90%. This means that the contribution of social support with achievement motivation in athletic athletes is 27.90%, while the rest is influenced by other factors of 72.10% outside the study.

### DISCUSSION

The results showed that there was a significant effect of social support on the achievement motivation of athletic athletes. The contribution of social support to achievement motivation in athletic athletes is 27.90%. The better the athlete's social support, the higher the achievement motivation. These results are from the research that there is a significant effect of social support on athletes' achievement motivation. The support received by the athlete will make the athlete feel accepted in the group and cared for by the people around him so that the athlete can feel comfortable with his environment.

Every human being needs achievement. However, to be able to excel in various things, many problems are faced by individuals, one of which is related to achievement motivation. Achievement motivation is the desire to get something done to achieve a standard of success (Locke & Schattke, 2019); (Staniewski & Awruk, 2019). Achievement motivation arises because of a tendency to achieve success or achieve the desired end goal. High achievement motivation encourages athletes to overcome all obstacles and not give up when encountering difficulties in matches (Cowden et al., 2019). Athletes with high achievement motivation will make various efforts and fight hard to get the best performance. The high achievement motivation of every athlete is expected to encourage athletes to achieve the best results.

Many factors such as self-esteem, self-concept, self-efficacy, and others affect achievement motivation, but the most important is social support (Chang et al., 2018). The various types of social support received are very beneficial for athletes (Sullivan et al., 2020); (Fogaca, 2021). Social support is a feeling of pleasure, appreciation of care, or assistance obtained by individuals from other people, where other people here can be interpreted as individuals or groups. Social support is the provision of advice, and information where an individual feels cared for, loved, feels valued by those around him (McNeil et al., 2019).

Several types of social support include emotional support, appreciation, instrumental support, and informative support (Wohn et al., 2018); (Gilmour et al., 2020). This encourages athletes to motivate themselves to achieve. The social support that individuals have is different. Some individuals have low social support, but others have high social support. Individuals with high social support have a better life experience, high self-esteem, and a more positive outlook on life than individuals with lower social support. Individuals with high social support direct their behavior towards positive consequences and vice versa for individuals with less social support. Individuals are more likely to experience negative psychological consequences, so athletes with high social support have a more positive outlook on life.

Social support can come from people closest to the individual, such as parents and coaches for the athletes themselves. Social support can be obtained from people who have close relationships with individuals such as relatives, friends, or organizational members, but the most important social support comes from family (Li et al., 2019); (Suwinyattichaiorn & Johnson, 2022). With the support from the closest people to the athlete, the athlete is excited to achieve success in the match because he does not want to disappoint the people who have supported him and always encouraged him to achieve success. Individuals who receive social support will believe that individuals are loved, cared for, valued, and part of their social environment. Many novice athletes fail to achieve success, for example, not because of a lack of potential, but because of an environment that does not allow them to excel, for example, the lack of support from parents and qualified coaches.

The role of parental support is to encourage their children and support both in terms of facilities and infrastructure to increase children's enthusiasm for performing. Parental support can be interpreted as a form of attention, appreciation, comfort, and this support can be felt either individually or in groups. Parental support has a very strong influence in determining career decisions

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in athletes. The athlete's career decision can be interpreted as an athlete's process orientation path that can be seen through their development. Career decisions and family support provide accuracy in permitting children so they can determine the direction in developing athletes' talents to excel.

### CONCLUSION

The results showed that there was a significant effect of social support on the achievement motivation of athletic athletes. The contribution of social support to achievement motivation in athletic athletes is 27.90%. The better the athlete's social support, the higher the achievement motivation. The advice that can be given is that athletes are expected to increase their achievement motivation. It is hoped that people around athletes, such as parents, coaches, and friends, will provide the support that can help athletes so that they have a positive impact on their achievements. Athletes must maintain and develop enthusiasm while undergoing the best possible training program. Parents always encourage their children and provide good infrastructure to support children's achievements.

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## Cephalometric Evaluation of Changes in Tongue Position, Posture and Pharyngeal Airway Dimensions Following Treatment of Angle's Class 1 Bimaxillary Proclination



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### ABSTRACT

**Objectives:** The aim of the study is to determine and correlate the effects of anterior teeth retraction on tongue position, posture and pharyngeal airway dimensions, in Angle's Class 1 bimaxillary dentoalveolar proclination cases treated with all first premolar extraction.

**Materials and Methods:** Pre and post treatment lateral cephalogram of fifteen Class I bimaxillary dentoalveolar proclination patients in the age group of 15-25years treated orthodontically as maximum anchorage cases with Preadjusted Edgewise Appliances (MBT prescription) and extraction of all first premolars were compared.

**Results:** Tongue position analysis showed significant decrease in tg1: 2.2 +/- 1.52 mm (p = 0.001) and TGL: 4.2 +/- 3.877 mm (p = 0.001). Tongue posture analysis showed a significant decrease in Point 1: 1.48 +/- 1.92 mm (p=0.028), Point 2: 1.44 +/- 1.46 mm (p=0.008) and Point 5: 1.92 +/- 2.45 mm (p=0.026). Pharyngeal airway analysis showed significant increase in PNS-Ad1: 1.2 +/- 1.69 mm (p=0.016) while V-LPW: 2.0 +/- 3.047 mm (p=0.023) was decreased. No significant correlation was found between changes in total tongue length and velopharyngeal and glossopharyngeal airway.

**Conclusions:** A significant reduction in the total tongue length particularly in the posterior region was observed after retraction. Also there was a reduction in the distance between root of the tongue and uvula, dorsum of the tongue and the roof of mouth in the posterior and anterior part of palate respectively. There was an increase in the lower nasopharyngeal airway and a decrease in the hypopharyngeal airway.

**KEYWORDS:** Bimaxillary dentoalveolar proclination; Tongue position; Tongue posture; Pharyngeal airway; First premolar extraction.

### INTRODUCTION

Bimaxillary proclination, diagnosed by the presence of convex profile, upper incisor inclination of 115° and lower incisor inclination of 99° or more, together with an interincisal angle of 125° or less, often demands the extraction of first four first premolars for its treatment. Most of these extraction spaces will be used for incisor retraction and correction of lip procumbency which in turn will result in reduction of arch dimension and thus could affect tongue position and the upper airway dimension. <sup>[1]</sup>

Even though the tongue has been reported to move posteriorly after mandibular setback surgery, causing encroachment into the airway <sup>[2]</sup>, very few studies were conducted to evaluate the possible changes in tongue position and posture after extraction treatment and to correlate it with the changes in airway dimensions. Among the various studies conducted regarding the relationship between pharyngeal airway dimensions and extraction orthodontic treatment, some studies found that the middle and inferior airway dimensions diminished after the extraction treatment <sup>[3,4,5]</sup> while others <sup>[1,6,7]</sup> found no difference in the upper airway between pre and post-treatment.

Various clinical and imaging techniques are employed to determine the tongue posture. Clinical examination of tongue posture is limited because of anatomic constraints produced by the surrounding structures and the evaluation is highly subjective. Imaging techniques include lateral cephalograms, computed tomography, radiocinematography, electropalatography, electromagnetic articulography, magnetic resonance and 2-dimensional ultrasonography.

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Most previous studies of the pharyngeal airway, have been carried out using a two dimensional (2D) lateral cephalogram. [8] Cephalometry offers considerable advantages over other techniques, including low cost, convenience and minimal exposure to radiation, [9] but superimposition of the left and right images leads to errors, and the left-to-right width of the upper airway is not visible in 2D film. [8] Although numerous studies have been published using CBCT to evaluate airway, few have addressed the accuracy of the measures. [10]

Thus, the current study was done to investigate the effects and correlate the changes in tongue position, posture and upper airway dimensions following treatment of bimaxillary proclination cases treated as maximum anchorage with extraction of four first premolars.

### MATERIALS AND METHODS

Fifteen patients between age group of 15 to 25 years (1 male & 14 females patients) who were clinically diagnosed with Angle's Class I bimaxillary dent alveolar proclination and treated as maximum anchorage with extraction of all first premolars were considered for the study. The selected patients were devoid of crowding and extraction space was utilised for retraction of anteriors. Exclusion criteria included history of previous orthodontic treatment, developmental disorders & systemic diseases, cases with missing teeth, patients on medications affecting tooth movement, habits like mouth breathing, tongue thrusting etc., history of tonsillectomy, adenoidectomy, trauma, etc.

The study proceeded with the approval of both the Institutional Scientific committee and Ethical committee (AEC/REV/2016/43). All patients were strapped-up with 0.022" X 0.028" Preadjusted Edgewise Appliances – (PEA: MBT prescription) after extraction of all four first premolars. Anchorage was reinforced using Nance palatal arch and lingual arch during alignment and incorporating second molars during retraction in maxilla and mandible. Pre and post treatment lateral cephalograms were obtained with good hard and soft tissue outlines; teeth in full occlusion and lips at rest. All the lateral cephalograms were taken with the same machine (Orthophos XG5; Dentsply Sirona, Germany (*linear magnification of the machine = 11% approx.*)), by the same operator and were traced manually by the same investigator. To avoid bias these were retraced after 1 week and the two were compared.

The land marks used are given in Table 1. [5, 11, 12]

**Table 1. Landmarks**

<b>A: Dentofacial Analysis</b> [11]	
S	Sella : Geometric centre of the pituitary fossa
N	Nasion : The most anterior point on the frontonasal suture in the midsagittal plane
PNS	Posterior nasal spine: Posterior spine of the palatine bone constituting the hard palate
Point A	Subspinale: The most posterior midline point in the concavity between the ANS and the prosthion (the most inferior point on the alveolar bone overlying the maxillary incisors)
Point B	Supramentale: The most posterior midline point in the concavity of the mandible between the most superior point on the alveolar bone overlying the lower incisors (infradentale) and pogonion
li	Incisal tip of most prominent mandibular incisors
Is	Incisor tip of the most prominent maxillary incisor
Gn	Gnathion: A point located by taking the midpoint between the anterior (pogonion) and the inferior (menton) points on the bony chin
Me	Menton: Lowest point on the symphyseal shadow of the mandible
Go	Gonion: A point on the curvature of the angle
Or	Orbitale :The lowest point on the inferior rim of the orbit
Po	Porion: The most superiorly positioned point of the external auditory meatus
Ba	Basion: Lowest point on the anterior rim of the foramen magnum
Ptm	Pterygomaxillare: The contour of the pterygomaxillary fissure formed anteriorly by the retromolar tuberosity of the maxilla and posteriorly by the anterior curve of the pterygoid process of the sphenoid bone, the postero- superior most point on the opening is used



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Ptm pr	Ptm perpendicular: Perpendicular from Ptm to Frankfurt Horizontal Plane (FHP: line through Or and Po)
U6	Distal surface of Maxillary first molar
L6	Distal surface of Mandibular first molar
<b>B: Tongue Analysis</b> <sup>[12]</sup>	
Tg	Tongue point
Mc	Point on the cervical, distal third of the last erupted permanent molar
O	Middle of the linear distance U-li on Mc-li line
TT	Tip of the tongue
U	Tip of the uvula or its projection on Mc-li line
<b>C: Airway Analysis</b> <sup>[5]</sup>	
Hor	Most inferior point on the spheno-occipital synchondrosis
R	Point of intersection of line from Hor to PNS and posterior pharyngeal wall
Ad1	Point of intersection of posterior pharyngeal wall and line Ptm-Ba
SPPW	Point of intersection of line from soft palate center perpendicular to posterior pharyngeal wall
SPP	Point of intersection of line from soft palate center perpendicular to posterior pharyngeal wall and posterior margin of soft palate
U	The tip of the uvula
MPW	Foot point of perpendicular line from point U to posterior pharyngeal wall
TPPW	Point of intersection of posterior pharyngeal wall and extension of line B-Go
TB	Point of intersection of base of the tongue and extension of line B-Go
V	The most posteroinferior point on the base of the tongue
LPW	Foot point of perpendicular line from point V to posterior pharyngeal wall

Cephalometric analysis for dentofacial parameters is given in Table 2. <sup>[13,14]</sup>

**Table 2. Dentofacial Analysis**

Is-NA (linear)	Linear distance from Upper incisor to Nasion – Pt A plane
Is-NA (angular)	Angular measurement from Upper incisor to Nasion – Pt A plane
li-NB (linear)	Linear distance from lower incisor to Nasion – Pt B plane
li-NB (angular)	Angular measurement from lower incisor to Nasion – Pt B plane
Interincisal Angle	Angular measurement between long axis of upper and lower incisor
Is-SN	Angular measurement from Upper incisor to Sella – Nasion plane
li-GoGn	Angular measurement from lower incisor to mandibular plane
SN-GoGn	Mandibular plane angle
U6-Ptm per	Upper molar to pterygoid perpendicular to Frankfort horizontal plane
L6-Ptm per	Lower molar to pterygoid perpendicular to Frankfort horizontal plane

The tongue position and posture were evaluated using Rakosi's analysis based on Rakosi's template (Table 3 and 4).<sup>[12,16]</sup> It is a transparent plastic template (Figure 1) with an inscribed millimeter scale used to analyse the position of the tongue on the lateral cephalogram. The template is oriented at the point O, which is the centre point of the line through tip of lower incisor and the tip of uvula. A line is drawn through O, perpendicular to the horizontal base and extended to the palate. A further four lines are drawn, 30° to each other, resulting in a total of seven lines. These lines from O metrically evaluates the distance between tongue and various structures like soft palate, roof of mouth, tip of incisors.<sup>[15]</sup> The template is also used to determine the height of dorsum of the tongue on all seven lines.<sup>[16]</sup> Representation of the landmarks and lines are given in Figure 2.

# Cephalometric Evaluation of Changes in Tongue Position, Posture and Pharyngeal Airway Dimensions Following Treatment of Angle's Class 1 Bimaxillary Proclination

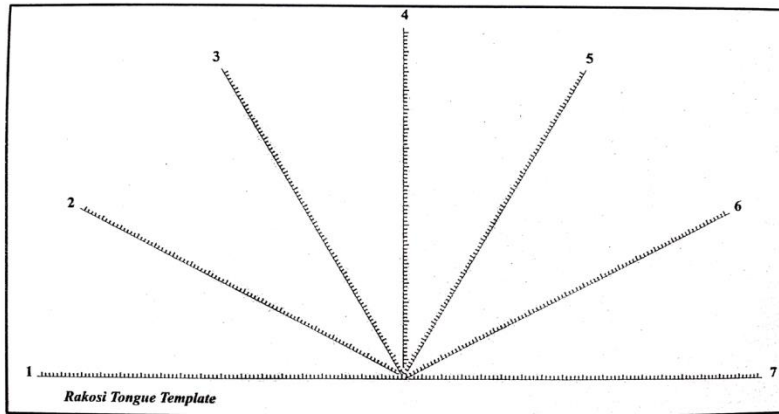


Figure 1. Rakosi's tongue template

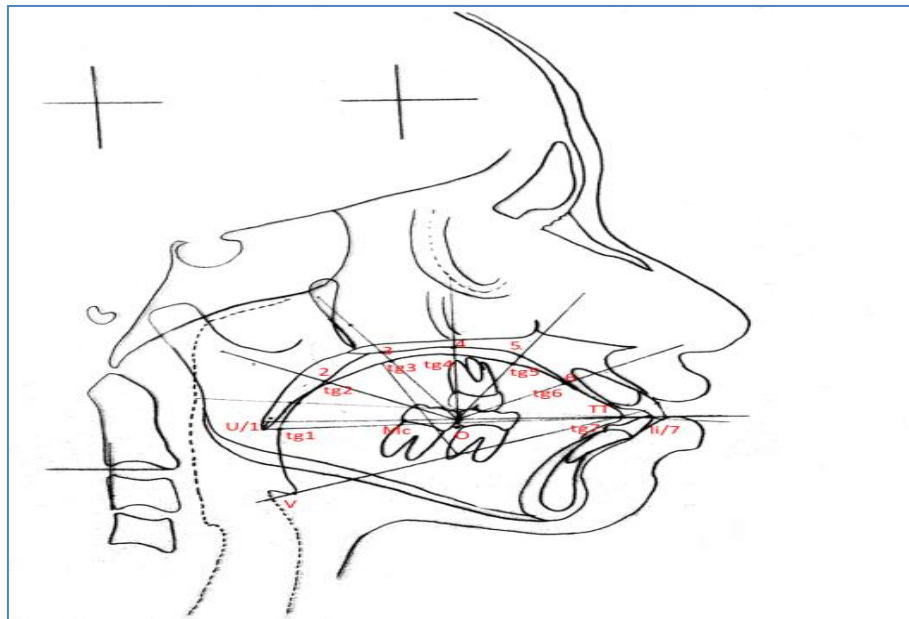
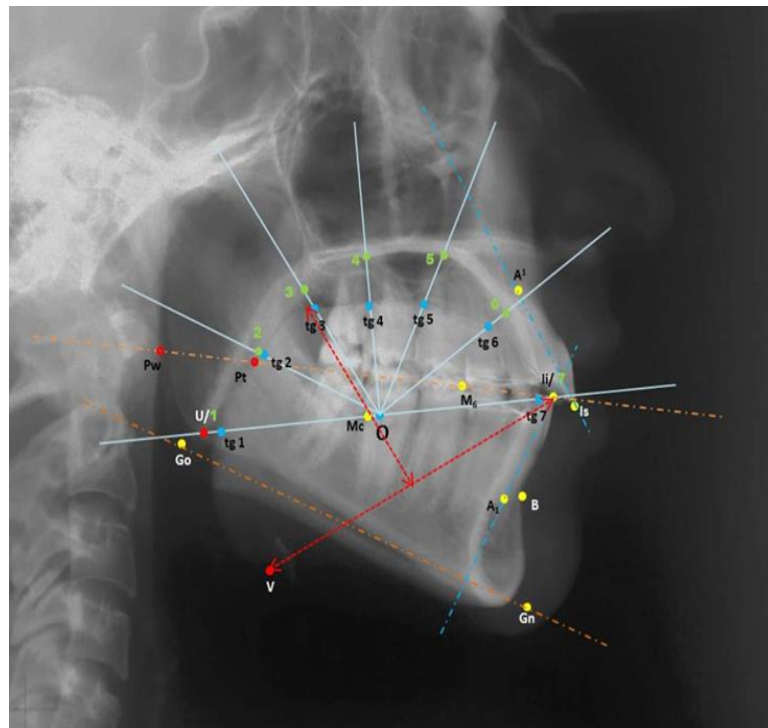


Figure 2. Landmarks and lines for Tongue analysis



## Cephalometric Evaluation of Changes in Tongue Position, Posture and Pharyngeal Airway Dimensions Following Treatment of Angle's Class 1 Bimaxillary Proclination

**Table 3. Evaluation of Tongue Position**

tg1	Line through the O and U or its projection. Measures the length of the tongue in the posterior portion (root) of the tongue.
tg2	Line constructed on O at 30° Mc-li line. Indicates the partial length of the tongue in the posterior region of the dorsum.
tg3	Line constructed on O at 60° Mc-li line. Indicates the partial length of the middle part of the dorsum of the tongue.
tg4	Line constructed on O at 90° Mc-li line. Indicates the partial length of the tongue in the middle of the dorsum of tongue.
tg5	Line constructed on O at 120° Mc-li line.
tg6	Line constructed on O at 150° Mc-li line. Indicates the partial length of the tongue in the anterior region of the tongue.
tg7	Line constructed on O at 180° Mc-li line. Indicates the partial length of the tongue in the tip region.
TGH	Perpendicular to the dorsum of tongue from mid of V-TT line. It measures the height of the tongue.
TGL	Tongue length. This is measured by distance between TT and V point.

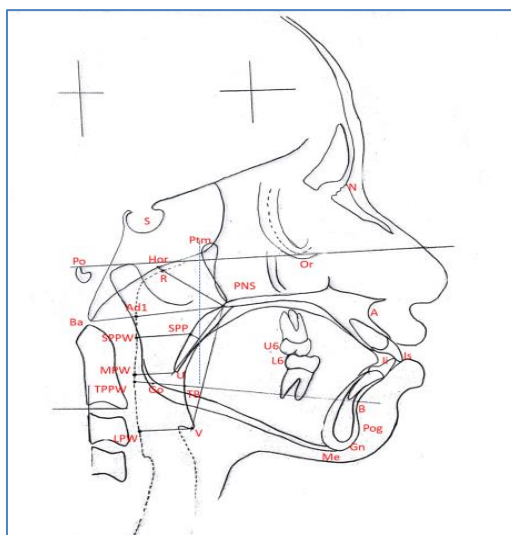
**Table 4. Evaluation of Tongue Posture**

Point 1	Distance between the soft palate and the root of the tongue
Point 2-6	Relationship of the dorsum of the tongue to the roof of the mouth
Point 7	Position of the tip of the tongue relative to lower incisors

Pharyngeal airway changes were evaluated in four different regions: nasopharynx, velopharynx, glossopharynx, and hypopharynx.<sup>[5]</sup> (Table 5 and Figure 3).

**Table 5. Upper Airway Analysis**

PNS-R	Distance between PNS and R	Upper nasopharynx
PNS-Ad1	Distance between PNS and Ad1	Lower nasopharynx
SPP-SPPW	Distance between SPP and SPPW	Velopharynx
U-MPW	Distance between U and MPW	
TB-TPPW	Distance between TB and TPPW	Glossopharynx
V-LPW	Distance between V and LPW	Hypopharynx
VAL	Distance between PNS and V	Vertical airway length



**Figure 3. Landmarks and lines for airway and Dentofacial analysis**

# Cephalometric Evaluation of Changes in Tongue Position, Posture and Pharyngeal Airway Dimensions Following Treatment of Angle's Class 1 Bimaxillary Proclination

## Statistical analysis

Data was analysed using R software (EZR version 1.32) for Windows.

**p value** (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests.

**Paired t test** was done for pre and post treatment dentofacial, tongue position and airway comparison. **Wilcoxon signed rank test** was done for tongue posture analysis as the data was not normally distributed.

**The Spearman's rank-order correlation** was used for correlation between two variables.

## RESULTS

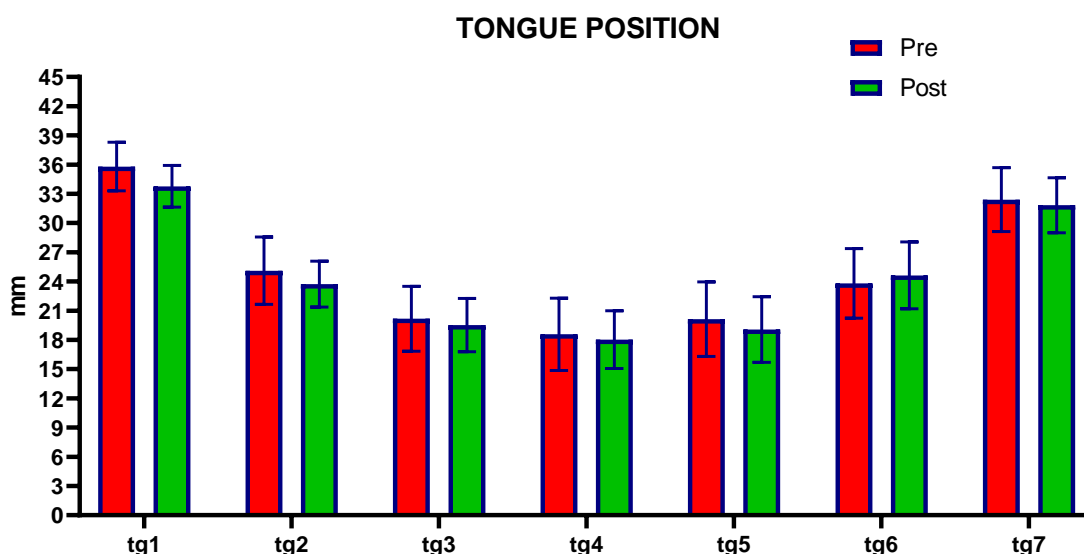
Dentoalveolar changes showed a mean retraction of upper and lower incisors by 4.26 +/- 2.71mm (p = 0.001) and 4.6 +/- 1.99 mm (p = 0.001) respectively which resulted in an Is/NA angle decreased by 11.33 +/- 4.7 ° (p = 0.001); li/NB angle decreased by 15.06 +/- 4.87° (p = 0.001); Interincisal Angle increased by 27 +/-9.08° (p=0.001) (Table 6). The mean distance from the distal surface of maxillary and mandibular first molars to the pterygoid vertical showed a significant decrease post treatment suggesting anchorage has been taxed.

**Table 6.Changes in Dentofacial parameters (n=15)**

Variable	Pre (Mean +/- SD)	Post (Mean +/- SD)	Pre-Post (Δ) (Mean +/- SD)	t	P
Is-NA (linear) (mm)	7.73 +/- 1.831	3.47 +/- 1.685	4.26 +/- 2.71	5.866	0.001*
Is-NA (angular) (°)	31.53 +/- 3.461	20.20 +/- 3.895	11.33 +/- 4.7	9.162	0.001*
li-NB (linear) (mm)	10.27 +/- 2.251	5.67 +/- 1.447	4.6 +/- 1.99	9.740	0.001*
li-NB (angular) (°)	42.60 +/- 5.938	27.53 +/- 3.758	15.06 +/- 4.87	11.820	0.001*
Is-SN (°)	117.87 +/- 5.083	107.73 +/- 6.307	10.13 +/- 5.35	7.326	0.001*
li-GoGn (°)	108.73 +/- 8.172	93.33 +/- 5.219	15.4 +/- 4.67	12.766	0.001*
Interincisal Angle (°)	101.93 +/- 9.513	129.13 +/- 6.232	27 +/- 9.08	-11.601	0.001*
SN-GoGn (°)	31.33 +/- 7.880	31.47 +/- 8.193	0.133 +/- 1.598	-.323	0.751
U6-Ptm per (mm)	18.07 +/- 3.474	20.33 +/- 3.498	2.26 +/- 1.62	-4.975	0.001*
L6-Ptm per (mm)	18.53 +/- 3.523	20.40 +/-3.158	1.86 +/- 1.56	-5.164	0.001*

\*significant at the 0.05 level.

The results displayed in Table 7 shows a significant decrease in tg1 by 2.2 +/- 1.52 mm (p = 0.001), TGL by 4.2 +/- 3.877 mm (p = 0.001), while no significant changes were found in tg2, tg3, tg4, tg5, tg6, tg7 and TGH (p >0.05).



**Figure 4. Graphical representation of changes in Tongue position preoperatively and postoperatively**

Only tg1 showed statistically significant change. Post treatment values of all parameters except tg6 were decreased.

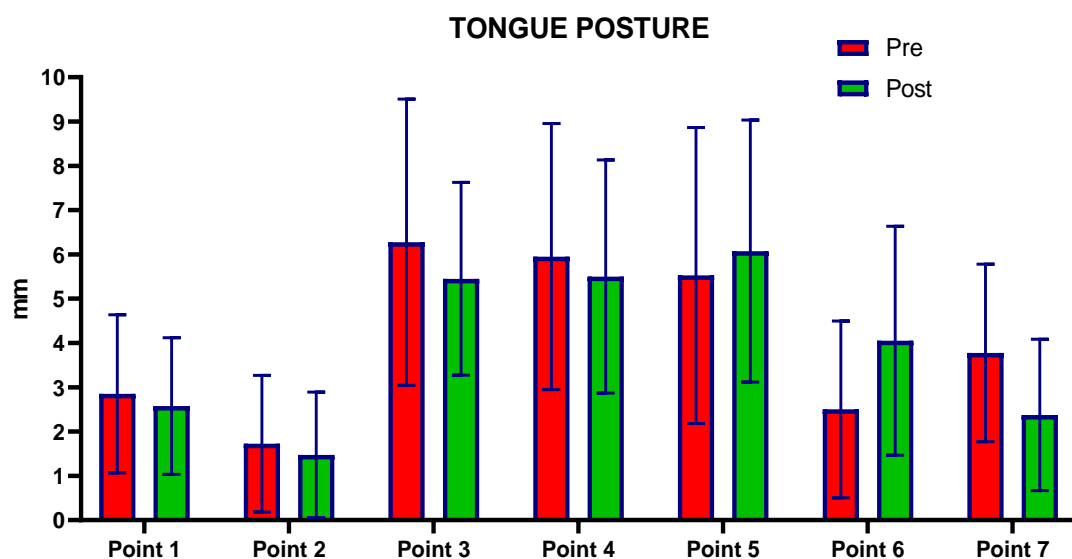
## Cephalometric Evaluation of Changes in Tongue Position, Posture and Pharyngeal Airway Dimensions Following Treatment of Angle's Class 1 Bimaxillary Proclination

**Table 7. Changes in Tongue position (n=15)**

Variable (mm)	Pre (Mean +/- SD)	Post (Mean +/- SD)	Pre-Post ( $\Delta$ ) (Mean +/- SD)	t	P
tg1	36.07 +/- 2.492	33.87 +/- 2.386	2.2 +/- 1.52	5.036	0.001*
tg2	25.27 +/- 3.712	24.27 +/- 2.344	1.00 +/- 3.35	1.222	0.266
tg3	20.20 +/- 3.802	19.40 +/- 2.947	0.80 +/- 4.057	.571	0.456
tg4	18.47 +/- 3.871	18.00 +/- 3.140	0.467 +/- 4.068	.287	0.664
tg5	20.33 +/- 3.848	19.60 +/- 3.521	0.73 +/- 4.69	.574	0.555
tg6	24.73 +/- 3.555	25.20 +/- 3.590	0.467 +/- 3.53	-.614	0.620
tg7	32.87 +/- 3.420	31.93 +/- 3.218	0.933 +/- 3.21	.978	0.280
TGH	32.67 +/- 3.559	32.27 +/- 3.218	4.2 +/- 3.877	.441	0.780
TGL	74.73 +/- 5.800	70.53 +/- 6.854	4.2 +/- 3.877	4.061	0.001*

\*significant at the 0.05 level.

Tongue posture after treatment displayed a significant decrease in Point 1 by 1.48 +/- 1.92 mm ( $p = 0.028$ ), Point 2 by 1.44 +/- 1.46 mm ( $p = 0.008$ ) and Point 5 by 1.92 +/- 2.45 mm ( $p=0.026$ ), while no significant changes were found in Point 3,4,6 and 7 ( $p >0.05$ ).



**Figure 5. Graphical representation of changes in Tongue posture preoperatively and postoperatively**

Point 6 and point 7 showed statistically significant change postoperatively. Post treatment value of point 6 significantly increased, while value of point 7 significantly decreased. Post treatment value of point 5 is increased but the change is statistically insignificant.

Tongue posture after treatment displayed a significant decrease in Point 1 by 1.48 +/- 1.92 mm ( $p = 0.028$ ), Point 2 by 1.44 +/- 1.46 mm ( $p = 0.008$ ) and Point 5 by 1.92 +/- 2.45 mm ( $p=0.026$ ), while no significant changes were found in Point 3,4,6 and 7 ( $p >0.05$ ). (Table 8)

**Table 8. Changes in Tongue posture (n=15)**

Variable (mm)	Pre (Mean +/- SD)	Post (Mean +/- SD)	Pre-Post ( $\Delta$ ) (Mean +/- SD)	z	P
Point 1	3.7545 +/- 1.55007	2.2727 +/- .86959	1.48 +/- 1.92	-2.041	0.028*
Point 2	2.6727 +/- 1.43881	1.2273 +/- 1.25227	1.44 +/- 1.46	-2.675	0.008*

## Cephalometric Evaluation of Changes in Tongue Position, Posture and Pharyngeal Airway Dimensions Following Treatment of Angle's Class 1 Bimaxillary Proclination

Point 3	7.1364+/- 3.35478	5.4545+/- 2.62159	1.68 +/- 3.64	-1.379	0.157
Point 4	6.5000+/- 3.26343	4.9545+/- 2.89357	1.54 +/- 2.91	-1.530	0.110
Point 5	7.3364+/- 2.35044	5.4091+/- 3.29255	1.92 +/- 2.45	-2.146	0.026*
Point 6	3.2727+/- 2.04161	3.0909+/- 2.37506	0.19 +/- 2.12	.000	0.782
Point 7	4.0909+/- 2.43740	2.4545+/- 1.95518	1.63 +/- 2.84	-1.690	0.086

\*significant at the 0.05 level.

Table 9 shows that there was a significant increase in PNS-Ad1 by 1.2 +/- 1.69 mm (p=0.016) and decrease in V-LPW by 2.0 +/- 3.047 mm (p=0.023), whereas PNS-R, SPP-SPPW, U-MPW, TB-TPPW and VAL showed no significant changes (p >0.05).

**Table 9. Changes in airway dimensions (n=15)**

Variable (mm)	Pre (Mean +/- SD)	Post (Mean +/- SD)	Pre-Post ( $\Delta$ ) (Mean +/- SD)	t	P
PNS-R	19.73 +/- 4.250	20.47 +/- 3.701	0.733 +/- 2.05	-1.684	0.188
PNS-Ad1	24.13 +/- 5.069	25.33 +/- 4.402	1.2 +/- 1.69	-2.837	0.016*
SPP-SPPW	13.93 +/- 3.654	13.47 +/- 3.758	0.467 +/- 1.407	1.284	0.220
U-MPW	11.80 +/- 3.764	13.47 +/- 3.758	1.4 +/- 2.66	1.964	0.061
TB-TPPW	11.80 +/- 4.212	11.00 +/- 3.251	0.8 +/- 3.098	1.131	0.334
V-LPW	16.00 +/- 2.777	14.00 +/- 3.780	2.0 +/- 3.047	2.582	0.023*
VAL	53.67 +/- 4.030	53.73 +/- 3.575	0.067 +/- 2.086	-.191	0.903

\*significant at the 0.05 level.

A correlation analysis was also done to determine if the decrease in glossopharyngeal and hypopharyngeal airway was related to a decrease in tongue length. (Table 10)

**Table 10. Correlation analysis between tongue length with glossopharyngeal and hypopharyngeal airway**

		TB-TPPW	V-LPW
Spearman's rho	TGL	.305	.434
	Correlation Coefficient	.270	.106
	p-value	15	15
	N	15	15

\*significant at the 0.05 level.

## DISCUSSION

### Dentofacial structures

A significant amount of retraction was observed suggested by a decrease in the linear and angular measurements of upper and lower incisor inclination, the inclination of the upper incisor to the cranial base and of the lower incisor to the mandibular plane. (Table 6) Absence of a change in mandibular plane angle suggests that the mechanics used for the correction of bimaxillary dentoalveolar proclination has no significant effect on the vertical dimension. Absolute anchorage devices like temporary anchorage devices, extra oral anchorage devices, etc. were not considered for the present study, thus some amount of anchorage loss was inevitable during retraction. As there was sufficient amount of retraction, anchorage loss was ignored.

### Tongue position

The present study used Rakosi's tongue template to assess the tongue position and posture similar to studies by Verma et al.,<sup>[12]</sup> Primozic et al.,<sup>[17]</sup> Subhramanya RM and Gupta S<sup>[18]</sup> and Tarkar et al.<sup>[19]</sup> A significant decrease in the overall tongue length (TGL), particularly in the posterior region (tg1) (Table 7) was also observed which is in concurrence by the study conducted by Nagmode et al.<sup>[20]</sup>. The author concluded that the restriction of the tongue after bimaxillary proclination treatment is considered to be the main cause of relapse and space reopening due to reduction in the tongue length. But the study conducted by Germec –Cakan et al.<sup>[4]</sup> found that there is no difference in the total tongue length after treatment.



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## Tongue posture

The present study showed a more retruded tongue posture towards its root as represented by a significant decrease in Point 1 and Point 2 (Table 8) suggesting a reduction in tongue space in the posterior part of the oral cavity after retraction. It also showed a superior positioning of the dorsum of the tongue or an increase in the tongue height at Point 5 region which could be due to incisor retraction. Even though there was a significant retraction of lower anteriors, there was no significant change in the relation between the tip of the tongue and the lower incisors. No similar studies were done in bimaxillary dentoalveolar proclination cases to compare the results obtained from the present study.

## Pharyngeal airway

Many studies<sup>[21, 22, 23, 24, 25, 26]</sup> have proved the reliability of lateral cephalograms in evaluating pharyngeal airway and therefore use of cephalograms in this study is justified. In the present study, the dimension of the nasopharynx was increased and that of hypopharynx were significantly decreased (Table 9). Studies by Germec-Cakan et al.,<sup>[4]</sup> Wang et al.,<sup>[5]</sup> Chen et al.,<sup>[3]</sup> Bhatia et al.,<sup>[27]</sup>, Nuvushetty et al.<sup>[28]</sup> showed similar results except for an increase in the nasopharynx. Nagmode et al.<sup>[20]</sup> found a significant increase in upper nasopharyngeal airway measured between PNS-R while in the present study even though an increase was found, it was statistically insignificant but the lower nasopharyngeal airway between PNS-Ad1 showed a significant increase in dimension (possibly attributed to growth and regression of the adenoid tissues). Wang et al.,<sup>[5]</sup> Bhatia et al.,<sup>[27]</sup> Nuvushetty et al.,<sup>[28]</sup> observed a significant decrease in glossopharyngeal and velopharyngeal airway dimensions contradictory to the results in the present study. The varying results could be attributed to the anchorage methods used.

Vertical airway length was not affected similar to results by Bhatia et al.<sup>[27]</sup> and Nagmode et al.<sup>[20]</sup>, implying that the effect was observed more in horizontal dimensions rather than in vertical dimensions of pharyngeal airway. But, Wang et al.<sup>[5]</sup> and Nuvushetty et al.<sup>[28]</sup> found a decrease in the same. Valiathan et al.,<sup>[7]</sup> Al Maaitah et al.,<sup>[1]</sup> Stefanovic et al.,<sup>[6]</sup> Pliska et al.,<sup>[29]</sup> revealed that there was no significant changes in the airway dimensions following maximal retraction in bimaxillary dentoalveolar proclination cases probably due to mandibular growth and the high variability of oropharyngeal volume.

Correlation analysis (Table 10) suggested that there is no significant relation between a decrease in tongue length with the decrease in dimensions of glossopharyngeal and hypopharyngeal airway.

These results should be viewed in the light of the fact that not only anteroposterior dimensions, but the vertical and transverse dimensions of these complex anatomical structures need to be further evaluated using newer three-dimensional imaging technique for more comprehensive results. Thus, the treatment plan must be modified depending on the risk-benefit analysis as per the patient's needs.

## CONCLUSIONS

- The tongue occupied a more retruded and an anterosuperior posture after retraction.
- There was a significant decrease in the total length of the tongue after retraction.
- There was an increase in the lower nasopharyngeal airway and a narrowing of the hypopharyngeal airway after retraction.
- There is no significant relation between changes in tongue length and lower airway dimensions.

## CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest

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## The Effect of Learning Facilities on Student Achievement During the Covid-19 Pandemic



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**ABSTRACT:** This study aims to determine the relationship between learning facilities and the learning achievement of Physical Education, Sports, and Health students at SMA Negeri 1 Sayegan during the Covid-19 pandemic. This type of research is quantitative with a correlational approach. The population in this study were students at SMA Negeri 1 Sayegan, amounting to 97 students who were taken based on the total sampling technique. The learning facility instrument uses a questionnaire, while the Physical Education, Sports, and Health learning achievement uses report cards. The data analysis technique used Pearson Correlation Product Moment analysis. The results showed that there was a significant relationship between learning facilities and the Physical Education, Sports, and Health learning achievement of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic, with a count of 0.552 and a significance value of  $0.000 < 0.05$ . Learning facilities have a relationship with the Physical Education, Sports, and Health learning achievement of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic by 30.50%. These results indicate that if the learning facilities are getting better or fulfilled, the Physical Education, Sports, and Health learning achievement will also be getting better.

**KEYWORDS:** Learning facilities, Physical Education, Sports, and Health learning achievement, covid-19 pandemic.

### INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a disaster that causes all community activities to be limited and the space for movement in various aspects is limited, without exception in the education aspect (Pereira et al., 2020); (Dhawan, 2020); (Gautam et al., 2021). Education is a conscious and planned effort to create a learning atmosphere and learning process so that students can actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and state. (Gaol & Sitepu, 2020). The quality of education is currently experiencing challenges as a result of the Covid-19 outbreak Covid-19 is a global pandemic whose spread is very worrying. As a result, the government must work together to suppress the spread of the Covid-19 virus by issuing a policy so that all members of the community must practice social distancing or maintain a distance. With this policy, all community activities that used to be carried out outside the home by gathering and in groups must now be stopped for a moment and replaced with activities in their homes. School closures due to Covid-19 affect learning and assessment methodologies (Kovacs et al., 2022); (Zviedrite et al., 2021). Especially in the Covid-19 pandemic, now learning and assessment are carried out remotely so that a teacher must be able to assess carefully and by considering the condition of students who have different backgrounds, both from economic factors, the character of students during learning and in terms of family education. Online learning is a new way of teaching and learning process that utilizes electronic devices, especially the internet in the delivery of learning. Online learning makes students communicate through device intermediaries, resulting in reduced interaction between one individual and another. This lack of interaction coupled with the limitation of physical meetings makes students bored (Bano et al., 2019); (Nassoura, 2020); (Sadykova & Meskill, 2019); (Marshall & Kostka, 2020). Online learning is considered to be the only medium for delivering material between teachers and students, during a pandemic emergency (Chansanam et al., 2021). Online learning, is entirely dependent on internet network access.

Various media can also be used to support the implementation of online learning. Examples, virtual classes using Google Classroom, Edmodo, and Schoology services, and instant messaging applications such as WhatsApp (Nadeak, 2020); (Alshaboul et al., 2021). Online learning has been widely carried out in the context of education, as evidenced by several studies that explain this (Mukhtar et al., 2020); (Bączek et al., 2021); (Zylfiu et al., 2020); (Hussein et al., 2020); (Dung, 2020), online learning provides

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benefits in helping to provide access to learning for everyone, thereby removing physical barriers as a factor for learning in the classroom (Pei & Wu, 2019), even it is seen as something that is effective to implement. However, according to (Pilkington, 2018) it is undeniable that not all learning can be transferred to an online learning environment.

The obstacles faced in online learning are the lack of adequate supporting facilities and infrastructure (Khuluqo et al., 2021); (Suherman, 2021); (Karalis, 2020), lack of mastery of technology skills by teachers (Khadka, 2021); (Maphalala et al., 2021); (Pandey et al., 2021), limited internet network (Simamora, 2020); (Bariham et al., 2021). One of the subjects affected by the Covid-19 pandemic is Physical Education, Sports, and Health.

Various limitations on online learning, Physical Education, Sports, and Health naturally encountered various obstacles and obstacles during the Covid-19 pandemic. Physical Education, Sports, and Health is an important subject because it helps develop students as individuals and social beings so that they grow and develop naturally. The implementation prioritizes physical activity, especially sports, and healthy living habits. One of the main goals of Physical Education, Sports, and Health is to encourage the motivation of the subject to improve academic achievement or physical exercise training. With the presence of Physical Education, Sports, and Health, a person's potential will be able to develop. Physical Education, Sports, and Health is essentially an educational process that utilizes physical activity to produce holistic changes in individual qualities, both physically, mentally, and emotionally. Physical activity is the main and dominant thing in learning physical education. In addition, another uniqueness of physical education is that it can improve the physical fitness and health of students, increase the mastery of rich physical skills, and increase students' understanding of the principles of motion and how to apply them in practice (Quennerstedt, 2019); (Opstoel et al., 2020); (Bukhari et al., 2019); (Prontenko et al., 2020).

One of the external factors that affect learning outcomes is learning facilities. Learning facilities are all equipment, materials, and furniture that are directly used in the learning process that can make it easier for students to learn (Wulandari et al., 2021); (Kingsley, 2019); (Soltaninejad et al., 2021). Learning facilities include all the facilities needed in the teaching and learning process, both movable and immovable so that the achievement of educational goals can run smoothly, regularly, effectively, and efficiently so that students can achieve optimal learning outcomes. The completeness of learning facilities can affect the smoothness and continuity of the learning process. The entirety of learning facilities helps students learn, and the lack of learning tools or facilities hinders learning progress (Eze et al., 2018); (Churiyah et al., 2020).

The learning facilities used during this pandemic are online learning facilities where teachers and students feel that they are not optimal in the learning process due to the lack of learning time and problems with supporting facilities such as inadequate laptops or cellphones. Based on where the learning activities are carried out, the learning facilities are grouped into two: (1) learning facilities in schools and (2) learning facilities at home. Learning facilities influence learning achievement, especially learning facilities at home. The existence of learning facilities will support students' academic and non-academic activities and support the realization of a good learning process (Abdurahman et al., 2019). The availability of learning facilities at home cannot be separated from the role of parents in providing learning facilities and infrastructure. Parents' concern about equipping learning facilities will benefit the learning process (Lase et al., 2022); (Garbe et al., 2020). The availability of complete learning facilities at home can increase students' motivation to learn and improve student learning achievement (Ferri et al., 2020). However, if the facilities are inadequate, it can hinder students' learning process.

### METHOD

This type of research is correlational research. Correlational research is research conducted to determine whether there is a relationship between two or several variables. The method used in this study is a survey method, while the techniques and data collection uses questionnaires and learning outcomes. The survey method is an investigation conducted to obtain facts from existing symptoms and look for factual deficiencies. The population in this study was students at SMA Negeri 1 Sayegan, totaling 135 students. The instrument or tool used to measure learning facilities is in the form of a closed questionnaire. Grid in Table 1:

**Table 1. Home Study Facility Instrument Grid**

Variable	Factor	Indicator	No Items	
			Favorable	Unfavorable
Home Study Facilities	Room or place to study at home	Dedicated study room at home	1	2
		Study room size	3	4
		Study room paint color	5	6
		Air ventilation	8	7
		Study room lighting	9	10

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	Home study furniture	Special study chairs and tables	11	12
		Study lamp	13	14
		Bookshelf	15	16
	Study aids	Stationary	17	18
		<i>Handphone</i>	19	20
		Sports equipment	21	22
		Laptop	23	24
	Learning resources	Textbooks	26	25
		Internet facilities	28	27
<b>Total</b>			<b>28</b>	

The instrument used to determine the Physical Education, Sports, and Health learning achievement of students at SMA Negeri 1 Sayegan is based on the odd semester report cards. The results of the instrument validity test showed that of the 28 items all items were valid. This is because  $r_{\text{arithmetic}} > r_{\text{table}}$ , then this instrument can be used for research. The reliability test of this study used the Cronbach Alpha method which was assisted by a computer program. The results of the reliability test were 0.878 out of 28 items.

### FINDING

The results of the descriptive analysis are intended to determine the learning facilities and learning achievements of Physical Education, Sports, and Health students at SMA Negeri 1 Sayegan during the Covid-19 pandemic. The full results are in Table 2.

**Table 2. Descriptive Statistics of Learning Facilities**

Statistic	
<i>N</i>	135
<i>Mean</i>	54,99
<i>Median</i>	55,00
<i>Mode</i>	57,00
<i>Std. Deviation</i>	10,60
<i>Minimum</i>	33,00
<i>Maximum</i>	81,00

When displayed in the form of an Assessment Norm, student learning facilities at SMA Negeri 1 Sayegan during the Covid-19 pandemic are presented in Table 3.

**Table 3. Learning Facility Assessment Norms**

No	Interval	Category	Frequency	Percentage
1	$95 < X$	very good	0	0,00%
2	$78 < X \leq 95$	good	10	7,41%
3	$61 < X \leq 78$	enough/moderate	39	28,89%
4	$44 < X \leq 61$	not good	68	50,37%
5	$X \leq 44$	not very good	18	13,33%
<b>Total</b>			<b>135</b>	<b>100%</b>

Based on Table 3 above, it shows that student learning facilities at SMA Negeri 1 Sayegan during the Covid-19 pandemic were in the "not very good" category of 13.33% (18 students), "not good" of 50.37% (68 students), "enough/moderate" by 28.89% (39 students), "good" 7.41% (10 students), and "very good" 0.00% (0 students).

The statistical description of the Physical Education, Sports, and Health learning achievement data of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic is complete in Table 4.

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**Table 4. Descriptive Statistics of Physical Education, Sports, and Health Learning Achievement**

Statistic	
<i>N</i>	135
<i>Mean</i>	74,93
<i>Median</i>	76,00
<i>Mode</i>	76,00
<i>Std. Deviation</i>	5,60
<i>Minimum</i>	64,00
<i>Maximum</i>	86,00

When displayed in the form of an Assessment Norm, the Physical Education, Sports, and Health learning achievement of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic is presented in Table 5.

**Table 5. Norms of Physical Education, Sports, and Health Learning Achievement Assessment**

No	Interval	Category	Frequency	Percentage
1	75 ≤	Fulfill Minimum Mastery Criteria (KKM)	78	57,78%
2	≤ 74	Not fulfill Minimum Mastery Criteria (KKM)	57	42,22%
<b>Total</b>			<b>135</b>	<b>100%</b>

Based on Table 5 above, shows that the Physical Education, Sports, and Health learning achievement of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic was in the "Fulfill Minimum Mastery Criteria" category of 57.78% (78 students) and "Not Fulfill Minimum Mastery Criteria" 42.22% (57 learners).

The normality test of the data in this study used the Kolmogorov-Smirnov method. The results of the data normality test carried out in each group were analyzed using the SPSS version 20.0 software program for windows with a significance level of 5% or 0.05. A summary of data is presented in Table 6.

**Table 6. Normality Test Results**

No	Variable	<i>p</i>	<i>Sig</i>	Description
1	Learning Facilities (X)	0,436	0,05	Normal
2	Physical Education, Sports, and Health Learning Achievement (Y)	0,351	0,05	Normal

Based on the statistical analysis of the normality test that has been carried out using the Kolmogorov-Smirnov test in Table 6, the variables of learning facilities and learning achievement of Physical Education, Sports, and Health students obtained normality test results with a significance value of  $p > 0.05$ , which means the data is normally distributed.

The linearity test of the relationship was carried out through the F test. The relationship between the independent variable (X) and the dependent variable (Y) was declared linear if the sig value  $> 0.05$ . The results of the linearity test can be seen in Table 7 below:

**Table 7. Linearity Test Results**

Functional Relationship	<i>p</i>	<i>Sig.</i>	Description
Learning Facilities (X)* Physical Education, Sports, and Health Learning Achievement (Y)	0,257	0,050	Linier

From Table 7 above, it can be seen that the significance value ( $p$ )  $> 0.05$ . So, the relationship between the variables of learning facilities and the learning achievement of the Physical Education, Sports, and Health of students is stated to be linear.

The correlation coefficient significance test was carried out by consulting the r table. If the calculated r is consulted with the r table using an error rate of 5%. If the significance value of  $p < 0.05$ , then the hypothesis is accepted and the significance value of



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$p > 0.05$ , then the hypothesis is rejected. If  $r$  count is greater than the  $r$  table, then there is a positive and significant relationship between the variables tested. The results of hypothesis testing are presented as follows.

**Table 8. Correlation Test Results**

Functional Relationship	$r$ count	Sig.	Description
Learning Facilities (X)* Physical Education, Sports, and Health Learning Achievement (Y)	0,552	0,000	Significant

Based on Table 8 above, the calculated  $r$  coefficient is 0.552, while the significance value is 0.000. The calculated  $r$  value is 0.552, and the significance value is  $0.000 < 0.05$ , it can be interpreted that there is a significant relationship between learning facilities and the learning achievement of Physical Education, Sports, and Health students at SMA Negeri 1 Sayegan during the Covid-19 pandemic. The correlation coefficient is positive, meaning that if the learning facilities are getting better or fulfilled, the Physical Education, Sports, and Health learning achievement will also improve.

The coefficient of determination ( $R^2$ ) is essentially used to measure how far the regression model's ability to explain the variation of the dependent variable is. The results of the analysis in Table 9 are as follows.

**Table 9. Results of the Coefficient of Determination Analysis ( $R^2$ )**

<i>Model Summary</i>				
<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
1	0.552 <sup>a</sup>	0.305	0.298	4.69183
a. Predictors: (Constant), Learning Facilities (X1)				

The value of the coefficient of determination  $R$  Square or the contribution of learning facilities to the learning achievement of the Physical Education, Sports, and Health students at SMA Negeri 1 Sayegan during the Covid-19 pandemic was 0.305 or 30.50%. This means that the learning facility variable has a relationship with the learning achievement of the Physical Education, Sports, and Health of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic by 30.50%. At the same time, the rest is influenced by other factors of 69.50% outside this study. Other variables that affect Physical Education, Sports, and Health learning achievement include learning motivation, interests, talents, learning environment, and others.

## DISCUSSION

Based on the results of the study shows that there is a significant relationship between learning facilities and the Physical Education, Sports, and Health learning achievement of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic. Learning facilities have a relationship with the Physical Education, Sports, and Health learning achievement of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic by 30.50%. These results indicate that if the learning facilities are getting better or fulfilled, the Physical Education, Sports, and Health learning achievement will also improve. The results of this study are in line with several previous studies, including studies conducted (Eze et al., 2018); (Bakar, 2018); (Almusharraf & Khahro, 2020) shows that there is a positive and significant relationship between learning facilities and learning outcomes.

The results of the descriptive analysis showed that the student learning facilities at SMA Negeri 1 Sayegan during the Covid-19 pandemic were mostly in the less category, which was 50.37% (68 students). Due to the current pandemic, learning activities, especially on Physical Education, Sports, and Health practice materials, will cause difficulties for students because not all students have complete sports facilities at home. Students need additional facilities such as electronic devices such as mobile phones to find additional information that can be viewed on various sites. For example, you can view videos downloaded from Youtube and read and view images on your cellphone. However, an internet quota is also needed to run a connection to view videos, pictures, and explanations of Physical Education, Sports, and Health material on the internet. All the facilities owned by students will affect the value of learning.

(Ramij & Sultana, 2020) examined the readiness and practicality of online education in Bangladesh during the pandemic. This study analyzes primary information collected through surveys. A logistic regression model was applied to explain the assumptions, in line with the descriptive interpretation of the collected data. The results show that lack of technical infrastructure, high internet prices, low internet speed, financial crisis, and mental stress on students are the main barriers to online education in Bangladesh for most students.

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(Emon et al., 2020) examined the problems in Bangladesh due to online learning in higher education during COVID-19 imposed school closures. In Bangladesh, all universities are directed by the Ministry of Education to conduct online education. While some see this as an education-friendly policy, a recent survey of 2038 students at 45 higher education institutions run by BioTED, a new training and research initiative, found that a third of Bangladeshi students do not want to engage in online academic activities. The same study also found that 55 percent of students did not have adequate internet connectivity, and 44.7 percent did not have access to a computer (i.e., laptop, PC, tablet, etc.) to participate effectively in online teaching.

Students have problems with incompatible devices, sharing devices with other family members, unstable internet connection, restricted or unavailable internet access, data costs, purchase of new equipment, new programs or applications, lack of experience with ICT, lack of ICT skills, and inadequate learning platforms (Rahiem, 2020).

Conditions during the Covid-19 pandemic, the shift in learning methods or methods adjusts and follows the flow so that learning can take place. The solution so that the teaching and learning process can take place is to use online learning or e-learning, which is unavoidable and must be accepted by educational institutions (Fatonja et al., 2020); (Batubara, 2021); (Heng & Sol, 2021); (Jena, 2020). The implementation of education in learning specifically combines technology that connects internet networks and electronic technology. The internet is present in almost everything that is used. Starting from television, mobile phones and the internet can be found anywhere. The use of the internet allows students to find comfort and convenience; students can find various kinds of help, tutorials, and other types of aid materials that can be used to improve learning academically (Raja & Nagasubramani, 2018).

One of the challenges of online learning is that it requires adequate facilities and infrastructure such as laptops, smartphones, computers, and internet networks (Laksana, 2021); (Simamora, 2020). A student does not all have a laptop and a computer. The supporting factors of online learning using internet-based applications, therefore the readiness of internet infrastructure facilities and the need to carry out the teaching and learning process through learning media. However, the problem lies in the issue of quotas and internet networks. The problem with this network is due to the conditions and areas where students live in remote areas and do not all have a strong internet network.

Talking about learning facilities, actually not only schools as institutions for learning, but parents also play a role in providing facilities that can support the success of students. Complete facilities at home are needed by students to learn, for example: learning facilities which include tables, chairs, cupboards/bookshelves, rooms, stationery and pictures and lighting. Regarding the prerequisites that must be met regarding learning facilities at home to be said to be good, it can also refer to the prerequisites regarding learning facilities in schools as well as regarding the room.

Learning facilities are facilities and infrastructure that support learning activities such as rooms, books, media, materials and other supporting facilities. Furthermore, learning facilities are movable or immovable aspects that are intentionally given to students to facilitate learning activities so that students can achieve the expected goals (Batubara, 2021); (Kaso et al., 2021), (Kaso et al., 2021). Learning facilities are something that can lead to motivation for students. With more complete and adequate learning facilities, students will be more motivated in learning. Complete learning facilities will provide encouragement to students to study harder so that the learning outcomes of these students become better or increase. Thus, learning outcomes will increase or decrease according to the availability of learning facilities. The higher the learning facilities owned by students, the motivation to learn will also increase, and further learning outcomes are also higher or better.

Learning facilities at home are beneficial for students to do the assignments given at school that must be done at home and finds information related to the subject matter. With adequate home learning facilities, it is hoped that student outcomes will increase because adequate facilities foster students' enthusiasm for learning at home and make learning more enjoyable. Whether or not the learning equipment is complete, whether owned by the students themselves or those of the school, can have certain consequences on student learning achievement; a shortage of learning equipment can have negative repercussions; Among other things, for example, students cannot learn well, so it is difficult to expect to achieve high achievements. To support the learning process, in addition to learning resources that must be provided in a complete and reasonable manner, of course, are learning equipment. Infrastructure whose existence is not used for the teaching and learning process, but it directly supports the implementation of online learning, namely the home of each student, because the implementation of online learning is carried out learning from home. The availability and adequacy of facilities are one of the requirements to support the success of online learning or e-learning (Oladele & Modebelu, 2021); (Nugroho, 2020); (Silvana et al., 2021).

### CONCLUSION

The conclusion of the study shows that there is a significant relationship between learning facilities and the learning achievement of the Physical Education, Sports, and Health of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic, with  $r$  count of 0.552 and a significance value of  $0.000 < 0.05$ . Learning facilities have a relationship with the Physical Education, Sports, and Health

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learning achievement of students at SMA Negeri 1 Sayegan during the Covid-19 pandemic by 30.50%. These results indicate that if the learning facilities are getting better or fulfilled, the Physical Education, Sports, and Health learning achievement will also be getting better.

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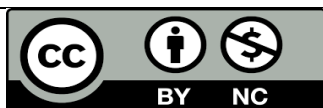
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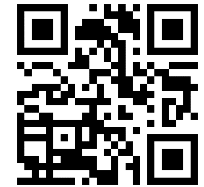
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## The Effectiveness of Yoga Exercise on Muscle Strength in the Elderly



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**ABSTRACT:** The increasing number of elderly people in Indonesia also increases the risk of degenerative diseases. In the elderly, it will bring about a complete change in their physique related to the decreased ability of body tissues, especially in physiological functions in the musculoskeletal and neurological systems. This study aimed to determine the effectiveness of Yoga exercise on increasing muscle strength in the elderly. This type of research is experimental. The population was all elderly Tresna Wreda Budhi Dharma Sleman Nursing Homes, Special Region of Yogyakarta, totaling 20 people with criteria above 60 years. Measuring lower body strength using a 30-second chair stand test. Yoga exercises were carried out for 16 meetings. The results showed that yoga exercise for 16 sessions effectively increased muscle strength in the elderly, with an increase of 12.5%. Suggestions that can be submitted based on the study in this study are yoga exercise training can be used as an option in muscle strength training for the elderly to improve muscle strength and maintain the ability to carry out daily activities; it is expected to be used as a reference for further researchers to conduct research with cases others in dealing with physical problems in the elderly.

**KEYWORDS:** Yoga exercise, muscle strength, elderly.

### INTRODUCTION

Aging is a condition that occurs in human life. A large number of Indonesia's elderly population will have a positive or negative impact in the future. Based on population projection data, in 2017, there were 23.66 million elderly people in Indonesia (9.03%), while in 2020, the number of elderly people increased to 27.08 million. It is predicted that in 2025 it will be 33.69 million. In 2030 it will be 40.95 million, and in 2035 it will be 48.19 million. These data indicate that the increase in number of the elderly population is getting higher. Looking at the data on the growth rate of the elderly, in 2025, Indonesia is estimated to occupy the 5th position as the country with the largest number of elderly people in the world (Ohoitenan & Agustina, 2020).

The aging process is not a disease. Aging is the process of slowly losing the ability of body tissues to maintain normal structure and function. These anatomical changes have an impact on decreasing muscle strength. In the elderly, it will bring about a complete change in their physique related to the reduced ability of body tissues, especially in physiological functions in the musculoskeletal and neurological systems. Changes in the musculoskeletal system in the elderly experience a decrease in hand grip strength by 5-15%, leg strength by 20-40% in men, hand grip in women by 10-20%, and leg strength by 30-50% (Lupa et al., 2017).

As you age, muscle fibers shrink, and muscle mass decreases. As muscle mass decreases, muscle strength also decreases. Muscular strength begins to decline around age 40, with an accelerated decline after age 60 ((Nomura et al., 2018); (Hara et al., 2018)). According to (Guedes et al., 2018), people can lose about 10 to 15% of muscle strength each week if the muscles are fully rested, and as much as 5.5% can be lost daily under conditions of complete rest and immobility. The decrease in physical ability is caused by the degeneration process, leading to reduced body activity in the elderly. Degenerative diseases are diseases that occur due to the aging process. An inactive or sedentary lifestyle will be one of the risk factors for the emergence of various diseases caused by lack of movement (hypokinetic) ((Nandi et al., 2019); (Baker & Petersen, 2018); (Hou et al., 2019)).

A real decrease in function in the elderly is a decrease in muscle strength which will result in a reduction of the ability of muscle flexibility, which will affect the ability to maintain postural balance or body balance. Decreased muscle strength can lead to a reduction in functional ability in the elderly because muscle strength affects almost all daily activities so that their life needs can increase, and there is dependence on help from others. Decreased muscle strength in the upper extremities can cause the elderly



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to be unable to hold cups or glasses properly and unable to have and lift heavy objects (Jeon). Decreased muscle strength in the lower extremities can cause movements to become sluggish and stiff, steps become short, feet cannot tread firmly, easily wobble, and standing is already unstable, which can pose a risk of falling easily (Grimmer et al., 2019).

Realizing healthy, independent, active, and productive elderly people requires physical activity or sport that allows the elderly to maintain their physical fitness. The sport in question is yoga exercise. Yoga practice should be recommended to the elderly to increase muscle flexibility and range of motion of the joints, which is essential in improving the quality of life of the elderly. Yoga is a very popular sport today; Yoga practice is a comprehensive health system that is beneficial for improving physical health and providing peace of mind and soul ((Moore & Pennington, 2021); (Cartwright et al., 2020)). Yoga in Sanskrit is "yuj," which means the union of breath, body, and soul ((Bhardwaj, 2019); (Erkin & Akçay, 2018); (Tiwari & Negi, 2019); (Hemamalini, 2018)). Yoga is a systematic condition for improving the body's condition, understanding the mind, and liberating the soul.

Yoga is one of the most natural and comfortable forms of exercise that is practiced all over the world in some form or another by people of every gender, age, physical ability, etc. ((Vaidya et al., 2021); (Shawahna & Abdelhaq, 2020)). If practiced regularly, yoga will connect the mind, body, and spirit, allowing for a stronger connection with other people and the universe (Zafeiroudi, 2021). Yoga is a systematic condition for improving the body's condition, understanding the mind, and liberating the soul. If practiced regularly, Yoga will connect the mind, body, and spirit, which allows for a stronger connection with other people and the universe ((Guddeti et al., 2019); (Boaventura et al., 2022)). Yoga is a form of exercise that combines breathing techniques, relaxation, meditation, and stretching. Yoga is a person's activity that focuses the mind on controlling the five senses and the body.

Yoga is a concept that was born in India, then developed in society from ancient times until now, and has experienced changes and differences. Through a series of careful and concentrated physical exercises, a Yoga practitioner is taught to awaken all parts of his body and soul. From the background described above, the authors are interested in researching the effectiveness of Yoga exercises on muscle strength in the elderly.

### METHOD

This type of research is experimental. The experimental method is a systematic method to build a relationship containing a causal-effect relationship phenomenon. The population was all elderly Tresna Wreda Budhi Dharma Sleman Nursing Homes, Special Region of Yogyakarta, totaling 20 people with criteria above 60 years. Measuring lower body strength using a 30-second chair stand test. Purpose: to measure lower or lower body strength, which is very important for the elderly to perform many tasks such as climbing stairs, walking, and reducing the risk of falling opportunities for the elderly. Facilities and Equipment: Flat surface, chairs, stopwatch Officers: Test guides and score takers. Implementation: The test taker sits on the chair that has been provided; his right and left hands are folded and crossed on his chest, then stands up straight within 30 seconds. Assessment: Strength scores are seen from the ability of the participants to stand for 30 seconds; the best score from one experiment is recorded as a score in seconds with an accuracy of 0.5 kg. Data analysis techniques include descriptive analysis, prerequisite test (normality and homogeneity test), and hypothesis testing using paired sample test. Analysis using SPSS 23 software.

### FINDING

The treatment was carried out for 16 meetings. Each meeting was held for 1 hour, starting with warming up  $\pm$  10 minutes, the core exercise by giving Yoga exercise  $\pm$  40 minutes, and cooling down  $\pm$  10. The results of the descriptive statistical analysis of the pretest and posttest of muscle strength in the elderly are presented in Table 1:

**Table 1. Results of Statistical Descriptive Analysis**

Muscle Strength	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	20	8,00	13,00	10,80	1,77
Posttest	20	9,00	14,00	12,15	1,69

Based on Table 1, it shows that the muscle strength of the elderly at the pretest was on average  $10.80 \pm 1.77$ , while at the posttest after being given Yoga exercise, it increased by an average of  $12.15 \pm 1.69$ .

Data normality test using the Shapiro-Wilk method using SPSS 23, the results are in Table 2:

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**Table 2. Results of Normality Test Analysis**

Muscle Strength	Shapiro-Wilk		
	Statistic	df	Sig.
Pretest	0,202	20	0,176
Posttest	0,165	20	0,157

Based on the statistical analysis of the normality test that has been carried out using the Shapiro-Wilk test, muscle strength data at pretest and posttest obtained normality test results with a significance value of  $p > 0.05$ , which means the data is normally distributed.

Homogeneity test using Levene Statistics using SPSS 23, the results are in Table 3:

**Table 3. Results of Homogeneity Test Analysis**

Test of Homogeneity of Variances			
Pretest-Posttest			
Levene Statistic	df1	df2	Sig.
0,101	1	38	0,752

Based on the results of the analysis in Table 3, it can be seen that the pretest-posttest muscle strength of the elderly obtained a sig.  $p > 0.05$ , so the data is homogeneous.

The hypothesis was tested using t test analysis, namely paired sample t test ( $df = n-1$ ) using SPSS 23. The results of hypothesis testing are presented in Table 4:

**Table 4. Analysis Results of Paired Sample T Test**

Paired Samples Test								
Pair	Paired Differences					t	df	Sig.(2-tailed)
	Mean	Std, Deviation	Std, Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Posttest	-1,35	0,67	0,15	-1,66	-1,04	9,000	19	,000

Based on the results of the analysis in Table 4, it can be seen that the t count is 9.000 and the t table (df 19) is 2.093 with a p significance value of 0.000. Because  $t_{\text{arithmetic}} 9,000 > t_{\text{table}} 2,093$ , and a significance value of  $0.000 < 0.05$ , this result indicates that there is a significant difference. Thus the alternative hypothesis ( $H_a$ ) which reads "There is a significant effect of Yoga exercise on muscle strength in the elderly", is **accepted**. The magnitude of the increase in muscle strength in the elderly after being given Yoga exercise was 1.35 or 12.5%.

### DISCUSSION

The results showed that yoga exercise for 16 meetings was effective in increasing muscle strength in the elderly. The results of this study are in line with research that has been carried out (Mondal et al., 2017) based on statistical analysis using SPSS, showing that there is an overall significant increase in  $F(2.24) = 35, 706, p = 0.000$  in the COP area for all five trials. Condition after yoga training, posthoc test showed a significant improvement for the elderly. The results of this study are in line with research that has been carried out by (Patel et al., 2019). The title of the effect of Yoga on balance in the geriatric population is that there is a very significant decrease ( $p\text{-value} < 0.05$ ) in TUG test scores between group A while there is a significant increase ( $p\text{-value} < 0.05$ ). Physical exercise Yoga is able to improve, strengthen and maximize flexibility and muscle strength (Donahoe-Fillmore & Grant, 2019); (Zarco et al., 2022); (Vaidya et al., 2021)), and balance ((Bintari et al., 2021). (Buttichak et al., 2019) said that muscle strength, muscle endurance, flexibility, and cardiovascular endurance could increase after being given Yoga therapy. Area(Csepregi et al., 2022) reported a significant increase in ankle flexibility, shoulder elevation, trunk extension, and trunk flexion after being given Hatha Yoga exercises. This can happen because of stretching/static stretching. Asanas as an essential component of increasing flexibility in Yoga practice. The results of the study by (Munawarah & Triariani, 2019) show that giving Yoga Exercises can improve static balance in the elderly.

Yoga combines physical movements in breathing, relaxation and meditation techniques, and stretching exercises. Yoga practice

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Is a combination of static and passive stretching. One Yoga session consists of several different parts that are performed sequentially, namely (1) postures (asanas of Hatha Yoga), (2) breathing techniques (pranayama), and (3) mental concentration or meditation (dhyana) (Yadav et al., 2022). Muscle stretching movements include movements in yoga such as bending to touch the feet in a standing and sitting position, arching the back like a cobra pose, and movements such as prostrating. In this stretch, the movement is done by stretching the muscle slowly until the muscle being stretched feels sore (still tolerable). In this situation, the body weight or other body parts hold the muscle stretch position, so the stretching is more maximal. When the muscle is passively stretched, some mechanical breakdown will occur between the cross-bridge filaments (actin and myosin). There will be a distance between these filaments, and the sarcomere will become elongated. When the strain is removed, the sarcomeres remain in an extended position. In addition, if stretching is carried out continuously, the fascia that covers the muscle (epimysium, endomysium, and perimysium) will experience semi-permanent lengthening. Other tissues such as tendons and ligaments will also lengthen. So this stretch can stimulate the production and storage of ingredients such as gel glycosaminoglycans (GAGs). This substance, along with water and hyaluronic, lubricates and maintains the distance between the fibers of the tissue.

Yoga exercise utilizes three phenomena of stimulation of receptors in muscles: muscle spindles, reciprocal inhibition, and Golgi tendon organs (GTO). When stretching a muscle, there is a change in muscle length that activates the muscle spindles in the muscle belly, which will send a signal to change the length of the muscle to the spinal cord, which will respond to this signal as a threatening change so that it will send a signal for contraction of the muscle being stretched which is called the stretch reflex. (Prochazka, 2021). So, it is necessary to stretch slowly and gradually hold the muscle spindles to adapt to changes so that the spinal cord will reduce the quality of the contraction impulses so that the muscles are more easily stretched and can do deeper yoga postures which will then increase flexibility. During yoga, the Golgi tendon organs are stimulated by changes in muscle tension that occur during restraining movements (LaSala et al., 2021). GTO will signal to the spinal cord about changes in muscle tension (Shah, 2012). Muscle contractions that occur when holding a Yoga posture cause muscle relaxation after doing that posture which ultimately, Yoga movements can increase flexibility and relaxation of the body. This condition shows that the implementation of yoga exercise has a good influence on static balance in the elderly. One of the benefits of implementing yoga is to reduce mass and increase muscle strength, including the pelvic, leg, and leg muscles that play an active role in the static balance of the elderly and prevent or slow down functional muscle loss.

### CONCLUSION

The study concludes that yoga exercise for 16 meetings effectively increases muscle strength in the elderly by 12.5%. Suggestions that can be submitted based on the study in this study are yoga exercise training can be used as an option in muscle strength training for the elderly to improve muscle strength and maintain the ability to carry out daily activities; it is expected to be used as a reference for further researchers to conduct research with cases others in dealing with physical problems in the elderly.

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## Small Side Game: Effectiveness of Increasing Futsal Passing



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**ABSTRACT:** This study aimed to determine the effect of small-sided game training on passing skills. This type of research is experimental. The population used is the female futsal athletes of Parada Sleman, totaling 20 people. Instruments to determine the ability to pass using tests of passing and controlling the ball (passing-controlling). The small-sided game exercise was carried out for 18 meetings. The results showed a significant effect of small-sided game training on passing skills, with an increase of 14.55%. This research can be useful and serve as additional material for studies on small side games training and passing skills as the basis for making training programs to improve player performance, as well as providing theoretical and practical evidence for coaches, as well as futsal practitioners to pay more attention to small side games training programs in practice passing skills.

**KEYWORDS:** small-sided *game*, *passing*, *futsal*.

### INTRODUCTION

Futsal is a sport growing rapidly in the community, both in the general public, education, and offices. Futsal is not only used as a recreational sport but has become a competitive sport in various regional, national, and international matches. Futsal is a very fast and dynamic game. Futsal is a dynamic sport and prioritizes changing positions quickly to find space by running (De Jong et al., 2022); (Doewes et al., 2022); (Ari, 2020). In a relatively small field, there is almost no room for mistakes. Therefore, cooperation between players is required through accurate passing.

Basic techniques must be mastered well because in futsal sports games, are required not to linger when carrying the ball; fast play is needed, strong defense, and structured attack, so it takes the ability to master the basic techniques of playing futsal perfectly. Ability to master basic futsal techniques, such as (a) passing, (b) chipping, (c) dribbling, (d) control, and (e) shooting (Sabdono et al., 2019); (Taufik et al., 2021); (Aryanti & Pangestu, 2021); (Sullivan et al., 2021).

In futsal games, the fast movement of players also causes players to be precise in passing, it is not surprising that in the futsal game, passing has an important role to pass the opponent or dismantle the opponent's defense. This is because in futsal games players always go with the philosophy of 100% ball possession (Marhaendro, 2018); (Ridlo & Bakti, 2021). A good pass will bring an open direction and can control the game when building a defense or attack strategy. In order for futsal passing to be mastered properly, there must be a continuous training process with the aim of automating futsal passing skills. Exercise is a systematic process of practicing, which is done repeatedly, increasing the training load day by day (Tibana et al., 2019); (Clemente, Clark, et al., 2019). The exercise here must pay attention to and refer to the principles of practice. An effective form of practice is to resemble a real match, one of which is small-sided games.

Small-sided games are games on a small field and played by less than eleven players (Gómez-Carmona et al., 2018); (Sarmiento et al., 2018); (Clemente et al., 2021); (Bujalance-Moreno et al., 2019); (Bennett et al., 2018); (Hammami et al., 2018). Each player in the practice of small-sided games is involved in the game and has more contact with the ball. This is because the size of the field used is less, and the number of players is not the same as in the original match. Small-sided game exercises can develop players' technical skills, tactics, mental, and physical condition (Selmi et al., 2018).

In the practice of small-sided games, in general, there are many variations of the form of exercise, this is so that the futsal game does not cause saturation. One thing that can be done to relieve boredom is to practice futsal small-sided games 3v3 and 4v4. Small-sided games are a suitable training tool or method to improve technique. The lower the number of players, the higher the number of technical actions (passes, dribbles, and shots) and contact with the ball (Clemente, Sarmiento, et al., 2019). Small-sided games can be meaningful when players do it in 3v3 because athletes have more passing, dribbling, and shooting. The more often the player passes, dribbles, and kicks, the stronger endurance is automatically needed (Sgrò et al., 2018).



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(Fernández-Espínola et al., 2020) his research showed that SSG can be used as an interesting methodological resource for training techniques and tactics in team sports at a young age. To do so, it is necessary to define the goals to be achieved and which variables to change, and how, some of the most decisive are the number of players, the size of the field area, and the manipulation of certain rules. In general, most studies agree that a reduction in the number of players leads to an increase in technical action. In this case, it is important to note that this is the frequency of the technical element per player. In this sense, (Clemente & Rocha, 2012) analyzed the effect of the number of players in handball and concluded that reducing it (eg, from 4 vs. 4 to 2 vs. 2) increases the number of ball contacts, interceptions, and dribbles per player. (Coutinho et al., 2019) stated that the provision of small-sided game exercises increases the movement of players' positions that are better and more structured.

### METHOD

This type of research is experimental. The experimental method is defined as a systematic method to build a relationship that contains a causal-effect relationship phenomenon. The population used is the female futsal athletes of Porda Sleman totaling 20 people. Instruments to determine the ability of passing using tests of passing and controlling the ball (passing-controlling). This instrument has a validity of 0.812 (Narlan, et al., 2017: 243). The procedure for carrying out the test is as follows: (1) Implementation Instructions: (1) The testee stands behind the shooting line at a distance of 3 meters from the wall/board, may be with the right foot ready to kick or vice versa. In front of the right/left of the Testee, there are futsal cones (the funnel) that are parallel to the firing line as an obstacle that must be passed during the test. (2) At the signal "Yes", the Testee kicks at the target/wall/board that has been marked with a 3 m x 50 cm rectangle. Then the Testee holds it back using the sole of the foot or the inside of the foot behind the kick line. (3) After holding the ball, the Testee shifts the ball with his right foot to the left of the futsal cones (the funnel) if the Testee starts kicking the ball to the right of the futsal cones (the funnel). Vice versa, if the Testee starts kicking on the left side of the futsal cones (the funnel) then after holding the ball, he must immediately shift the ball to the right side of the futsal cones (the funnel) with his left foot. (4) Perform this activity alternately between the right and left legs for 30 seconds. (5) If the ball goes far from the soccer area, then the Testee uses the reserved ball that has been provided. Data analysis techniques include descriptive analysis, prerequisite test (normality and homogeneity test), and hypothesis testing using paired sample test. Analysis using SPSS 23 software.

### FINDING

The research process was carried out in 18 meetings. The results of the statistical descriptive analysis of the pretest and posttest of passing ability are presented in Table 1:

**Table 1. Results of Descriptive Statistical Analysis of Pretest and Posttest Ability of Passing**

Passing Ability	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	10	8,00	22,00	16,50	4,93
Posttest	10	9,00	26,00	18,90	6,30

Based on Table 1, shows that the average passing ability during the pretest was  $16.50 \pm 4.93$ , while at the posttest, after being given small-sided games training, it increased by an average of  $18.90 \pm 6.30$ .

Test the normality of the data using the Shapiro-Wilk method. The normality test of the data carried out in each analysis group was carried out with the SPSS version 20.0 software program for windows with a significance level of 0.05, the results are in Table 2:

**Table 2. Results of Normality Test Analysis**

Muscle Strength	Shapiro-Wilk		
	Statistic	df	Sig.
Pretest	0,910	10	0,280
Posttest	0,898	10	0,207

Based on the statistical analysis of the normality test that has been carried out using the Shapiro-Wilk test, data on passing ability during pretest and posttest obtained normality test results with a significance value of  $p > 0.05$ , which means the data is normally distributed.



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The homogeneity test is intended to test the similarity of variance between the pretest and posttest. Homogeneity test using Levene Test using SPSS 23, the results are in Table 3:

**Table 3. Results of Homogeneity Test Analysis**

Test of Homogeneity of Variances			
Pretest-Posttest			
Levene Statistic	df1	df2	Sig,
1,683	1	18	0,211

Based on the analysis results in Table 3, it can be seen that the pretest-posttest of passing abilities obtained a sig.  $p > 0.05$ , so the data is homogeneous.

The hypothesis was carried out to test the effect of small-sided game training on passing skills. The analysis used the paired sample t test ( $df = n-1$ ) using SPSS 23 at a significance level of  $<0.05$ . The results of hypothesis testing are presented in Table 4:

**Table 4. Analysis Results of Paired Sample T Test**

Paired Samples Test								
Pair	Paired Differences					t	df	Sig, (2-tailed)
	Mean	Std, Deviation	Std, Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Posttest	-2,40	1,58	0,50	-3,53	-1,27	4,811	9	0,001

Based on the results of the analysis in Table 4, the t-count value is 4.811, with a p significance value of  $0.000 < 0.05$ . Then these results indicate that there is a significant difference. Thus, the alternative hypothesis, "There is a significant effect of small-sided game training on passing ability," is **accepted**. The increase in passing ability after being given small-sided game training is 14.55%.

### DISCUSSION

Based on hypothesis testing, it is known that there is a significant effect of small side game training on the passing ability of the female futsal athlete of Porda Sleman with an increase of 14.55%. Given the training for 18 meetings, the treatment clearly provides new knowledge in terms of training football passing techniques and also provides its own experience for athletes and gives a good impact, especially on passing skills.

Small-Sided Games are a training method that presents game situations like real games that make players gain mastery of technical, tactical, and physical aspects (Doewes et al., 2020); (Souabni et al., n.d.). A small side game is played on a field smaller than football in general, using modified rules and involving a number of players that are smaller than the actual number of players (García-Angulo et al., 2020). A small side game is a football game played on a smaller field with fewer than eleven players and is the best way for players to combine almost all elements of the game (Pellegrino et al., 2020).

In this study, the researcher gave a rule where participants were only allowed to make two touches per player, and after the team made five passes, the player who touched the last ball was required to shoot at the goal. The practice of small-sided games is very good because these exercises focus more on players with the rules that apply. The small side game exercise that is carried out gives more touches to the ball by players playing the game. Every player controlling the ball makes them calmer because there are more players involved in the game, and they can also improve their passing skills; the increase in the percentage of players' passing abilities is due to the small-sided games training method that requires players to increase their touch on the ball, then with the size of the ball. A reduced field, a faster and more measured touch to the ball, and more decision-making so that they can train mentally, physically, technically, and tactically. When the player touches the ball a lot, it results in being able to increase the ability to do passing, so initially, the student's movement in doing rigid passing becomes more and more maximal.

Small-Sided Games have commonly used modified games that take place in narrow spaces, involve a small number of players, and with modified game rules) they have been proposed to be an effective methodological tool for optimizing tactics and behavior (Práxedes et al., 2018); (Klingner et al., 2022); (Evangelio et al., 2019). The game also promotes the development of technical actions such as passing, dribbling, and shooting (Santos et al., 2020); (Trecroci et al., 2020), and has been shown to result in higher levels of sporting expertise in athletes because they simultaneously work on the two components of the action; decision-making

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process and technical implementation (Pizarro et al., 2019).

(Fernández-Espínola et al., 2020), in his research, showed that SSG could be used as an interesting methodological resource for training techniques and tactics in team sports at a young age. To do so, it is necessary to define the goals to be achieved, which variables to change, and how some of the most decisive is the number of players, the size of the field area, and the manipulation of specific rules. In general, most studies agree that a reduction in the number of players leads to increased technical action. In this case, it is essential to note that this is the frequency of the technical element per player. In this sense, (Clemente & Rocha, 2012) analyzed the effect of the number of players in handball. It concluded that reducing it (e.g., from 4 vs. 4 to 2 vs. 2) increases the number of ball contacts, interceptions, and dribbles per player. (Coutinho et al., 2019) stated that the provision of small-sided game exercises increases the movement of players' positions that are better and more structured.

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## Perception of Donor Breast Milk and Determinants of Its Acceptability amongst Pregnant Women Attending Antenatal Clinic in a Secondary Facility in South-South Nigeria



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### ABSTRACT

**Introduction:** In Nigeria particularly, the percentage of infants exclusively breastfed is quiet low. Similarly, there is no human breast milk bank in the whole of West African Sub-region.

**Methodology:** This was a cross sectional descriptive study conducted amongst 200 pregnant women attending antenatal clinic in Central Hospital Benin. Perception (knowledge and acceptance) of donor breast milk amongst these women were assessed using pre-tested questionnaires.

**Results:** Nearly half (45.5 %,) of the mothers were between the ages of 30-39 years. Two-thirds of the mothers (67%) also were not aware of donor breast milk. More than half of the mothers (56%) were willing to donate breast milk. Majority (74.4%) of the mothers were unwilling to accept donor breast milk.

**Conclusion:** This study revealed poor knowledge of donor breast milk as well as poor acceptance of donor breast milk.

### INTRODUCTION

Human milk is considered the best source of nutrients for all newborn babies.<sup>1</sup> Specifically, it should be considered the first choice of nutrient for premature infants, low birth weight neonates as well as vulnerable neonates receiving care in the neonatal intensive care unit.<sup>2,3</sup> This is because it is rich in bioactive substances that are essential in the development of the immune system.<sup>4</sup> Other benefits of breast milk include better neuro-cognitive/ long-term mental development, reduced incidence of necrotizing enterocolitis as well as retinopathy of prematurity, childhood diabetes and obesity.<sup>5</sup> It also shortens the length of stay of the baby in the neonatal intensive care unit, thereby providing direct cost saving benefits for the families of infants.<sup>6</sup>

Based on these advantage of breast milk and its superiority over formula feeds, WHO recommends that all mothers should feed their infants solely on breast milk for the first six months of life (irrespective of their HIV status). However for infants who cannot receive breastmilk directly from their own mother, WHO recommends that donated human milk and not formula feed is the next preferred option<sup>7</sup>. Donated human milk has been defined by the National Institute of Health and Clinical Science (NICE) as breastmilk expressed by a mother that is processed and stored in a donor milk bank for use by a recipient that is not the mothers baby.<sup>8</sup>

Breastfeeding promotion is largely connected to the collection of donor breastmilk, as owning a human milk bank in a health facility increases awareness about breastfeeding amongst members of the community.<sup>9</sup>

In addition the availability of donor breast milk is very significant for infants whose mothers cannot breastfeed because of medical problems like pulmonary tuberculosis, cancer/chemotherapy etc.<sup>10-11</sup>

In Nigeria, the percentage of infant exclusively breastfed is quite low.<sup>12</sup> This has impacted negatively on the neonatal mortality statistics in the country.<sup>12</sup> Also of grave concern is the fact that there is no human breast milk bank in the whole of West-Africa sub-region.<sup>13</sup> Due to the strong religious and cultural perceptions of mothers, establishing a breastmilk bank for the use in special cases will require in-depth consideration of its acceptability amongst mothers.<sup>13</sup> The existing medical literature of this in the facility where this study was conducted is highly deficient.

This study therefore assess the perception of pregnant women (receiving antenatal care in a secondary health facility) on the acceptance of donor breastmilk.

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## METHODOLOGY

This was a cross-sectional study conducted between December 2021 and June 2022 amongst pregnant women attending antenatal clinic in Central Hospital Benin City.

The Hospital is located around Sapele road area of Benin City and primarily offers secondary care to residents of Oredo Local Government area in Benin City, Nigeria.

A structured research administered questionnaire was used to obtain information from the pregnant women. Information obtained included biodata as well as other relevant information to assess their perception (knowledge and acceptance) of breastmilk bank.

Data collected were entered into a table and analyzed using the statistical package for the social sciences (SPSS version 20). Socio-economic status of the participants was determined using oyedeji's classification.<sup>14</sup> For all statistical tests, p-values<0.05 were considered significant.

## RESULTS

**Table 1. Sociodemographic Characteristics of Respondents**

Variable	Frequency (n = 200)	Percent
<b>Age group (years)</b>		
< 30	63	31.5
30 – 39	91	45.5
40 – 49	36	18.0
50 and above	10	5.0
<b>Mean ± SD</b>	<b>34.0 ± 7.8 years</b>	
<b>Level of education</b>		
Primary	16	8.0
Secondary	72	36.0
Tertiary	112	56.0
<b>Occupational Skill Level</b>		
Skill Level 0	21	10.5
Skill Level 1	15	7.5
Skill Level 2	116	58.0
Skill Level 3	37	18.5
Skill Level 4	4	11.5
<b>Number of children</b>		
< 3	106	53.0
3 – 5	86	43.0
> 5	8	4.0

Respondents within age group 30 – 39 years accounted for nearly half (91; 41.5%) of the participants. The mean age was 34.0 ± 7.8 years. More than half (112; 56.0%) and 116 (58.0%) of the respondents had tertiary level of education and occupation within skill level 2 respectively. Likewise, 106 (53.0%) of respondents had less than 3 children, while 86 (43.0%) had between 3 – 5 children.

**Table 2. Awareness of Donor Breast Milk and Source of Information**

Variable	Frequency (n = 200)	Percent
<b>Awareness</b>		
Yes	66	33.0
No	134	67.0
<b>Source of information (n = 66)</b>		
Friends	27	40.9

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Health workers	19	28.7
Internet	11	16.7
Mass media	5	7.6
Relatives	4	6.1

About one-third (66; 33.0%) of the respondent were aware of donor breast milk while slightly more than two-third (134; 67.0%) were not aware. Friends, health workers and internet were the sources of information in majority of respondents.

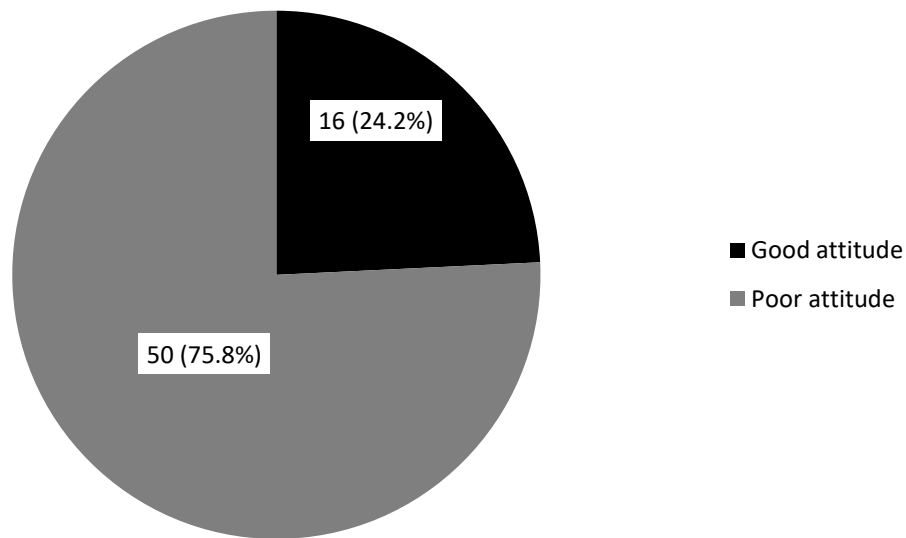
**Table 3. Attitude of Respondents towards Donor Breast Milk**

Variable	Frequency (n = 66)	Percent
<b>Willingness to donate breast milk</b>		
Yes	37	56.1
No	29	43.9
<b>Reasons for refusal to donate breast milk (n = 29)</b>		
Breast milk not sufficient for baby and recipient	9	31.0
Cultural belief	7	24.2
Religious belief	5	17.2
Inconvenience	4	13.8
Personal	2	6.9
Others	2	6.9
<b>Willingness to accept donor breast milk</b>		
Yes	17	25.6
No	49	74.4
<b>Reason for refusal to accept donor breast milk (n = 49)</b>		
Fear of infection	27	55.2
Cultural belief	10	20.4
Bad idea	6	12.2
Religious belief	6	12.2
<b>Overall attitude</b>		
Good attitude	16	24.2
Poor attitude	50	75.8

More than half (37 ;56.1%) of the respondents who were aware of donor breast milk were also willing to donate while only one-fourth (17 ; 25.6%) were willing to accept donor breast milk. Religious and cultural beliefs were the reason for the unwillingness to donate breast milk in more than one-third (12 ; 41.4%) of the respondents, while about one-third ( 9 ;31.0%) believed that that breast milk was not sufficient for their babies and recipients. Fear of infection and cultural belief were the reasons for the refusal to accept breast milk in 27 (55.2%) and 10 (20.4%) of respondents respectively.



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**Figure 1. Respondents Attitude towards Donor Breast Milk**

Negative attitude towards donor breast milk was observed in majority 50 (75.8%) of respondents.

**Table 4. Association between Attitude towards Donor Breast Milk and Socio-Demographic Characteristics of Respondents**

Variable	Overall Attitude		Test statistics	p-value
	Positive attitude (n = 16) Frequency (%)	Negative attitude (n = 50) Frequency (%)		
<b>Age group (years)</b>				
< 30	5 (31.1)	14 (28.0)		
30 – 39	5 (31.1)	25 (50.0)		
40 – 49	3 (18.8)	8 (16.0)		
50 and above	3 (18.8)	3 (6.0)	Fischer’s Exact = 3.330	0.349
<b>Level of education</b>				
Primary	0 (0.0)	2 (4.0)		
Secondary	3 (18.8)	12 (24.0)		
Tertiary	13 (81.2)	36 (72.0)	Fischer’s Exact = 0.547	0.853
<b>Occupational Skill Level</b>				
Skill Level 0	3 (18.8)	3 (6.0)		
Skill Level 1	0 (0.0)	3 (6.0)		
Skill Level 2	7 (43.8)	33 (66.0)		
Skill Level 3	4 (25.0)	5 (10.0)		
Skill Level 4	2 (12.4)	6 (12.0)	Fischer’s Exact = 6.120	0.178
<b>Number of children</b>				
< 3	8 (50.0)	30 (60.0)		
3 – 5	7 (43.8)	17 (34.0)		
> 5	1 (6.3)	3 (6.0)	0.774	0.803

Age of respondents did not show significant statistical association with attitude towards donor breast milk as nearly two-third ie 10 (62.2%) and majority ie 39 (78.0%) of respondents with positive and negative attitude respectively were less than 40 years (p

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= 0.349). The proportion of respondents with positive and negative attitude increased with increasing level of education with those with tertiary level of education accounting for the highest proportions (13; 81.2% and 36; 72.1%) of respondents with positive and negative attitude respectively. This association was however not statistically significant ( $p = 0.853$ ) Respondents with occupation within skill level 2 had the highest proportions ie 7 (43.8%) and 33 (66.0%) of positive and negative attitude respectively ( $p = 0.718$ ). The proportion of respondents with positive and negative attitude was noticed to decrease with increasing number of children with those who had less than 3 children accounting for half ie 8 (50.0%) and nearly two-thirds ie 30 (60.0%) of respondents with positive and negative attitude respectively. This association was also not statistically significant ( $p = 0.803$ )

**Table 5. Logistic Regression Model for the Determinants of Attitude towards Donor Breast Milk**

Predictors	B (regression co-efficient)	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	0.040	1.041	0.950	1.141	0.388
<b>Level of education</b>					
Tertiary	19.460	0001	0001	0001	0.999
Secondary	19.905	0001	0001	0001	0.999
Primary*	1				
<b>Occupational skill level</b>	-0.149	0.653	0.449	1.650	0.653
<b>Number of children</b>	0.018	1.018	0.612	1.694	0.945
<b>Practice of EBF</b>					
Yes	1.143	3.135	0.652	15.065	0.154
No	1				

### \*Reference category, $R^2 = 7.0\% - 10.5\%$ , CI= Confidence Interval

The variable in the model accounted for between 7.0% – 10.5% of the variation observed in the outcome variable (Positive attitude). With a year increase in age, the likelihood of having a positive attitude increased by 0.040. This was more likely by an odds ratio of 0.959 and it was not statistically significant ( $p = 0.388$ ). Level of education was not significantly associated with attitude towards donor breast milk. Respondents with higher occupational skill levels were 0.653 times less likely to have positive attitude, and this was also not statistically significant ( $p = 0.653$ ).

With an increase in the number of children, the likelihood of having positive attitude increased by 0.018 ( $p = 0.945$ ). Similarly, respondents who practiced exclusive breastfeeding were 3.135 times more likely to have positive attitude compared to those who did not practice exclusive breastfeeding. This was also not statistically significant ( $p = 0.154$ ).

## DISCUSSION

This study assessed the perception of mothers in a secondary health facility towards donor breast milk. Despite the importance of exclusive breastfeeding in reducing childhood morbidity and mortality, the exclusive breastfeeding rate in Nigeria is quiet low.<sup>12</sup> similarly, there is no breast milk bank in the whole of West African Sub-region and by extension Nigeria.<sup>13</sup>

Nearly half of the respondents in the study were between the ages of 30-39years. A similar proportion of mothers in this age bracket was studied by Iloh et al in South-East Nigeria.<sup>13</sup> About one third of the respondents had heard of the concept of breast milk donation. This is much lower than what has been reported in studies amongst mothers in Turkey, China but similar to what has been reported in some parts of Nigeria.<sup>13, 15-17</sup>. The difference in awareness level between mothers in our environment and those cited maybe partly due to less availability and accessibility of electronic media for dissemination of relevant health investigation compared to these countries.<sup>18, 19</sup>

Slightly more than half of those who have heard of breast milk bank were unwilling to donate breast milk. Similar finding was reported in Jos, Nigeria.<sup>20</sup>

Majority of those who were unwilling to donate like their counterparts in Jos were of the opinion that breast milk donation would reduce the quantity of milk available for their own babies.

The others identified religious and cultural beliefs as reasons why they were unwilling to donate. Although these concerns are cogent, they are however highly unsubstantiated and thus need to be addressed by adequate health education to breastfeeding mothers.

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Only a quarter of mothers who knew about breast milk banks were willing to accept donor breast milk from other sources. This is of ample concern as breast milk banking has been shown to contribute to fall in infant mortality as well as provide great relief for mothers who for some inevitable reasons cannot breastfeed their newborns.<sup>21,22</sup>

Majority of those who were unwilling to accept donor breast milk expressed the fear of transmission of infections to their babies. Similar reason has been given by mothers in some others studies.<sup>23, 24, 25, 26.</sup>

Thus, it is essential that donor breast milk must be properly preserve to prevent contamination.<sup>22</sup>

Also, women from whom such milk are obtained must be adequately screened to be sure that they are fit to donate breast milk.<sup>22</sup> If these measures have been put in place, there will also be need to adequately reassure mothers about these safety of donor breast milk.

Maternal age, level of education and occupational skills level were not found to significantly affect attitude toward donor breast milk. The cross-sectional nature of the current study as well as the not too large number of participants studied might be possible reason for these findings.

Finally, although not statistically significant, the likelihood of having positive attitude increased with an increased number of children as well as with the practice of exclusive breastfeeding.

Possible explanation for this might be due to the fact that with subsequent pregnancies, the strain on the mothers in terms of requirement needed to cater for other siblings increases, hence the need to source for alternate source of milk for her newborn. Similarly, mothers who practice exclusive breastfeeding are more likely to prefer human milk as source of nutrition for their neonates.

### **CONCLUSION**

Our study found the knowledge of donor breast milk amongst mothers in our environment to be quite low. Much needs to be done to educate mothers on the need to accept donor breast milk as alternate source of feed for their newborns.

### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

### **SOURCE OF FUNDING**

None

### **ACKNOWLEDGEMENT**

The authors are grateful to Unuakpotovwo Oyefia, Onyebuchi Abolo and Tahir Ibrahim for helping with data collection and arrangement of the manuscript.

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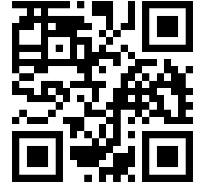
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## Inquiry-Based Online Learning to Improve Basic Technical Knowledge of Football Class Xi Students



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**ABSTRACT:** The study aimed to determine: (1) the effect of online inquiry learning methods on increasing the knowledge of basic soccer techniques for class XI students and (2) differences in knowledge of basic soccer techniques for class XI students between the experimental group and the control group. The method uses a "pre-test post-test control group design" experiment. The sampling technique is simple random sampling, totaling 33 students in the experimental class with the inquiry learning method treatment and 34 students in the control class. The instrument used is an essay test. Data analysis used a t-test with a significance level of 5%. The study results: (1) There is a significant effect of the online inquiry learning method on increasing the knowledge of basic soccer techniques for class XI students, the t value is 12.158 > t table is 1.693, and the significance is 0.000 < 0.05. (2) There is a significant difference in the knowledge of basic football techniques of class XI students between the experimental group and the control group; the t-count value is 9.617 > t-table 1.668, and the significance is 0.000 < 0.05.

**KEYWORDS:** inquiry learning, online learning, knowledge, basic soccer technique.

### INTRODUCTION

The Coronavirus disease (Covid-19) pandemic is a grievous disaster for the entire population of the earth. The rapid spread of the Covid-19 pandemic has disrupted the education sector, where students are unable to continue their learning activities at school (Jena, 2020); (Wahyuni et al., 2021); (Akat & Karataş, 2020). The impact on education sustainability caused by the Covid-19 pandemic, so that learning is carried out online (Alsoufi et al., 2020); (Mbiydzennyuy, 2020).

Online learning makes students communicate through device intermediaries, reducing interaction between one individual and another in communicating (Esra & Sevilen, 2021). The absence of this interaction, coupled with the limitation of physical meetings, makes students bored and is felt by many families in Indonesia, both in cities and in villages (Simamora, 2020). In Indonesia, many families are less familiar with doing school at home.

The new policy makes teachers think about applying appropriate learning patterns and can be applied in distance learning. Network-based or online learning is expected to be the right solution (Rachmadtullah et al., 2020). The use of online learning in various countries is increasing from year to year. This phenomenon is related to the rapid development of internet technology that integrates various devices used by humans (Aljawarneh, 2020); (Adarkwah, 2021). Most people in remote areas are confused because the information technology infrastructure is limited. The assessment of students who use online media encounters many obstacles in the community. Many community groups in Indonesia will be exposed to the long-term effects of Covid-19. The impact of education from a long-term perspective is the aspect of justice and increasing inequality between community groups and between regions.

Learning during a pandemic is very different from learning carried out before the pandemic, in learning before the pandemic was carried out with educators being able to meet face to face with students at school. Online learning is carried out, namely, educators and students cannot meet face-to-face because there is a distance that separates educators from students (Kusmaryono et al., 2021); (Rizaldi & Fatimah, 2020). This allows educators and students to be in different places through the internet network. Positively, online learning is beneficial for the continuity of learning during the pandemic (Wang et al., 2021); (Rasiah et al., 2020). In practice, online learning aims to meet educational standards by utilizing information technology by using computer devices or gadgets that are interconnected with students and teachers and students (Kassab et al., 2020); (Hoq, 2020); (Ritonga et al., 2021).

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The condition of activities that suddenly changed drastically is a challenge for teachers, especially teachers of Physical Education, Sports and Health (PJOK) so that the goals and objectives of PJOK can be achieved. Physical education is one of the fields of study provided by schools ranging from elementary to junior high to high school. Physical education learning is endeavored to form a good mental and healthy body in order to produce productive humans (Barker et al., 2020); (Nyberg et al., 2020); (Li et al., 2018). Sports coaching is recommended to cultivate students' interests and talents to achieve optimal sports achievements. The achievement of physical education goals is closely related to the teacher's ability to manage learning activities.

In teaching, exciting strategies and methods are needed to facilitate students in mastering the subject matter presented by the teacher. Thus, it is hoped that the material received can be stored in students' memories for a relatively long time. Physical education learning is a very strategic effort to achieve the expected goals. Educational association occurs through active interaction between students as students and teachers as educators. Students carry out learning activities and through this activity, there will be a change in their behavior; while learning activities are carried out by teachers to facilitate the learning process, the two roles will not be separated from the situation of mutual influence in the pattern of relations between the two subjects. Here the teacher plays more of a role as a manager or director of learning. Learning is a means to enable the learning process to occur in the sense of changing individual behavior through experiencing something created in the design of the learning process (Boström et al., 2018).

The current learning process still uses the old paradigm, namely teacher-centered learning by choosing direct learning. The teaching carried out by teachers at this time should have experienced a shift towards a learning center for students; there is also learning that has been centered on students, but in reality, there are still many students who have not been able to express their opinions.

To improve the quality of education and teaching, one of them is choosing a strategy or method of delivering material to increase student learning achievement (Retnawati et al., 2018); (Agarwal, 2018). For example, encouraging students to be actively involved in the learning process in class helps them develop their abilities according to their intellectual level. It will further strengthen students' understanding of the concepts being taught. This understanding requires interest and motivation, without any interest in each student, indicating that students do not have the motivation to learn. This is where the teacher's task must provide support in the form of motivation because with this help; students can get out of learning difficulties.

In the learning process at SMA Negeri 1 Piyungan, especially for class XI students, when the temporary learning process took place, it was seen that there were still some obstacles experienced by teachers or students that caused the teaching and learning process to be not conducive. These obstacles are the lack of variety in the development of learning models in providing subject matter, especially soccer games so that students get bored quickly when taking physical education lessons because the material is too monotonous and does not make physical education lessons a favorite awaited lesson. The next obstacle is that most of the students seemed indifferent. They ignored the material explained by the teacher so that during the learning process, students did not know, master, or understand the material and did not know the purpose of the soccer game taught in the learning.

Teachers as educators are expected to be able to create an environment that can motivate the spirit of learning by increasing the involvement of students directly and responsible for their learning (Islam et al., 2018); (Murkatik et al., 2020) because learning can be obtained with good results if students are willing to learn as well as possible. One of the efforts to stimulate students' curiosity and actively and systematically involve them to get the desired results in a short time in the Physical Education learning process is to apply the Inquiry learning model. The inquiry learning model is one of the relevant models by paying attention to activities that can facilitate students to master literacy skills. Inquiry means investigation / asking for information, free translation for this concept is that students are asked to search and find out for themselves (Simonson, 2019); (Khalaf & Mohammed Zin, 2018); (Uiterwijk-Luijk et al., 2019).

The Inquiry Model aims to train students' abilities in researching, explaining phenomena, and solving problems scientifically (Yuliati et al., 2018). In the inquiry process, the teacher, in this case, only acts as a facilitator, resource person, and group instructor. The inquiry learning model is a series of teaching and learning activities that involve all students' abilities to search and investigate so that they can formulate their findings (Chandra et al., 2020). The inquiry learning model is the process of forming questions, analyzing, and creating new knowledge that fully involves students in the learning (Onyema et al., 2019).

In addition, the inquiry learning model can make students find and use various information and ideas to increase their knowledge of a problem or issue (Sutaphan & Yuenyong, 2019). In other words, the inquiry learning model is a learning model that fully involves students in the learning process, can investigate existing problems, and find solutions to these problems themselves (Jerrim et al., 2020). Inquiry learning emphasizes the process of seeking and finding answers to a question in question.

The steps of the inquiry learning model are observing, formulating problems, formulating hypotheses or initial assumptions, collecting data or information needed in solving problems, testing or finding the truth of initial assumptions by processing existing information or data, and drawing conclusions (Sutiani, 2021). Inquiry learning steps are related to guided discovery learning which



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also facilitates students in formulating problems, providing conjectures, collecting required data or information, processing data to prove the truth of preconceived notions, and conveying ideas in making conclusions.

The application of inquiry learning can provide significant changes in the learning environment so that students can experience scientific attitudes and performance changes that positively affect student achievement (Sasson et al., 2018). Inquiry learning can provide experience, training, and a good understanding of the principles for planning student-centered inquiry activities where students have control over their learning (Song & Kong, 2014). Field (Sotáková et al., 2020) shows that inquiry in the revision phase is more effective than teaching without investigations in terms of conceptual understanding. It affects lower and higher cognitive processes (understanding, application, and analysis) and stimulates learning, especially in students with lower academic performance.

### METHOD

This research belongs to the type of quasi-experimental research. The design used in this study was a "pre-test post-test control group design." In this design, two groups were chosen randomly, then given a pretest to determine the initial state of whether there was a difference between the experimental group and the control group. The population in this study were students of class XI at SMA Negeri 1 Piyungan. Sampling in this study was done by simple random sampling. The sample in this study were students of class XIA SMA Negeri 1 Piyungan, amounting to 33 students as the experimental class with the inquiry learning method treatment and 34 students of class XIB SMA Negeri 1 Piyungan as the control class. The instrument used in this research is a test in the form of an essay—hypothesis testing using a t-test using the SPSS 23 program.

### FINDING

The research was conducted for four meetings. The pretest was carried out before the learning application was carried out, then a posttest was conducted. Descriptive statistical pretest and posttest knowledge of basic football techniques of class XI students between the experimental group and the control group are presented in Table 1:

**Table 1. Results of Pretest and Posttest Statistical Descriptive Analysis between Experimental and Control Groups**

Group	N	Min	Max	Mean	SD
Experiment Pretest	33	33.33	46.67	40.40	4.99
Experiment Posttest	33	46.67	73.33	58.99	8.52
Pretest Control	34	33.33	46.67	40.59	5.03
Control Posttest	34	26.67	53.33	40.78	6.92

Based on Table 1 above, it shows that the pretest knowledge of basic soccer technique knowledge of class XI students in the experimental group is 40.00 at the posttest is 58.99 and the pretest in the control group is 40.59 at the posttest is 40.78.

Test the normality of the data using the Shapiro-Wilk method. The normality test was analyzed using SPSS version 23.0 software for windows with a significance level of 5% or 0.05. The results are in Table 2:

**Table 2. Results of Normality Test Analysis**

Group	Significance	Description
Experiment Pretest	0,062	Normal
Experiment Posttest	0,235	Normal
Pretest Control	0,068	Normal
Control Posttest	0,128	Normal

Based on the statistical analysis of the normality test that has been carried out using the Shapiro-Wilk test, all pretest and posttest data were obtained from the results of the data normality test with a significance value (p) > 0.05, which means the data is normally distributed.

Homogeneity test was carried out to test the equation of several samples, namely homogeneous or not. The homogeneity test is intended to test the similarity of variance between the pretest and posttest using SPSS 23, the results are in Table 3:

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**Table 3. Results of Homogeneity Test Analysis**

Group	Sig.	Description
Pretest	0,857	Homogeneous
Posttest	0,133	Homogeneous

Based on the analysis results in Table 3, it can be seen that the pretest-posttest values obtained sig.  $p > 0.05$ , so the data is homogeneous.

The first hypothesis reads, "There is a significant effect of online inquiry learning methods on increasing the knowledge of basic soccer techniques for class XI students." The study's conclusion is significant if the  $t$  count  $>$   $t$  table and the sig value is less than 0.05 (Sig  $<$  0.05). The results of hypothesis testing are presented in Table 4:

**Table 4. Results of the Pretest and Posttest t-test of the Experimental Group**

Group	Mean	t count	t table	sig
Pretest	40,40	12,158	1,693	0,000
Posttest	58,99			

Table 4 shows that the  $t$  count is 12.158 and the  $t$  table (df 32) is 1.693 with a significance value ( $p$ ) of 0.000. Because  $t$  count  $12.158 >$   $t$  table 1.693, and a significance value of  $0.000 < 0.05$ , this result indicates a significant difference. Thus, the alternative hypothesis, "There is a substantial effect of online inquiry learning methods on increasing the knowledge of basic football techniques for class XI students," is accepted.

The second hypothesis reads, "There is a significant difference in the knowledge of basic football techniques of class XI students between the experimental and control groups." The conclusion of the study is significant if the  $t$  count  $>$   $t$  table and the sig value is less than 0.05 (Sig  $<$  0.05). The results of hypothesis testing are presented in Table 5:

**Table 5. Results of the t-test of the experimental group and the control group**

Group	Mean	t count	t table	sig
Experiment Class	58,99	9,617	1,668	0,000
Control Class	40,78			

Table 5 shows that the  $t$  count is 9.617 and the  $t$  table (df 65) is 1.668 with a significance value ( $p$ ) of 0.000. Because  $t$  arithmetic  $9.617 >$   $t$  table 1.668, and a significance value of  $0.000 < 0.05$ , these results indicate a significant difference. Thus, the alternative hypothesis ( $H_a$ ), which reads "There is a significant difference in the knowledge of basic football techniques of class XI students between the experimental group and the control group," is **accepted**. This means that the experimental group with the inquiry learning method treatment is better than the control group in increasing knowledge of basic football techniques, with an average difference of 18,21.

## DISCUSSION

The results of the study showed that there was a significant effect of the inquiry learning method on increasing the knowledge of basic football techniques for class XI students. This is in line with research that has been done, inquiry learning provides benefits to students because it can increase motivation and enthusiasm in learning ((Radu & Schneider, 2019); (Onyema et al., 2019), (Uğur et al., 2020). In addition, the self-regulated inquiry approach improves student achievement, especially for students with higher self-regulation. In addition, students who conduct an inquiry with self-regulated learning strategies increase their propensity to seek help information, self-efficacy, and several aspects of self-regulation, including time management, help-seeking, and self-evaluation (Lai et al., 2018).

With research results (Af'idayani et al., 2018) showed that "The results showed that the inquiry model had a significant impact on the skills of the science process and the learning outcomes of the learners." (Constantinou et al., 2018) also put forward the same thing in his research: inquiry science activity effectively improves learners' learning outcomes". Furthermore, (Ogan-Bekiroğlu & Arslan, 2014) research results that inquiry-based learning can improve students' conceptual knowledge skills and science process skills. Inquiry-based learning can improve cognitive learners' (Mupira & Ramnarain, 2018). One of the benefits of inquiry is to develop students' skills so that they are able to work like a scientist (Gunawan et al., 2019); (Rahayu et al., 2018); By learning

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inquiry, the knowledge obtained by students is easier to remember and more durable because it is obtained from the results of their own thinking (Al Mamun et al., 2020).

The inquiry learning model has many advantages over other learning models. These advantages include an inquiry learning model that emphasizes the development of cognitive, affective, and psychomotor aspects in a balanced way so that learning with this strategy is considered more meaningful and can provide space for students to learn according to students learning styles (Ilyas et al., 2018); (Pratama et al., 2020).

The inquiry learning model is a learning model that emphasizes the process of thinking critically and analytically to seek and find the answer to a problem in question. The inquiry learning model is an approach to learning that expects students to find and use various sources of information and ideas to increase students' understanding of the topic, or problems or require more than just answering questions or getting the right answers. This makes the inquiry learning model directly raise the ability or critical thinking skills of students in responding to problems, both individually and in groups. Through reflecting on the process during inquiry-based learning activities, students are given the opportunity to explore and understand both cognitive and affective domains.

### CONCLUSION

Based on the results of data analysis, description, testing of research results, and discussion, conclusions can be drawn, namely: (1) There is a significant effect of online inquiry learning methods on increasing knowledge of basic soccer techniques for XI grade students, with a t value of 12.158 > t table 1.693, and a significance value of 0.000 < 0.05. (2) There is a significant difference in the knowledge of basic football techniques of class XI students between the experimental group and the control group, with a t-count value of 9.617 > t-table 1.668, and a significance value of 0.000 < 0.05. Based on the conclusions of this study, there are several suggestions that can be presented, so that suggestions can be given to various parties, namely: (1) The influence of the inquiry learning model is carried out in groups, so there may be members who are less active, resulting in a less than optimal knowledge of basic football techniques. Therefore, teachers should be able to arouse students to be active in learning activities by providing guidance, motivation, and monitoring in each group. (2) Teachers should familiarize themselves with applying the inquiry learning model with good preparation, including in terms of students and the instruments needed, so that student learning outcomes can be more optimal.

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## The Causes and Effects of Drug Abuse on Pupils Academic Performance: A Case Study of Mindolo Secondary School in Kitwe, Zambia



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**ABSTRACT:** The study analyses the causes and effects of drug abuse on academic performance of pupils at Mindolo secondary school in Kitwe District, Zambia. This study used a descriptive survey design to find out the causes and effects of drug abuse on pupil's academic performance. Questionnaire and interviews were the instruments used to collect data and data was analyzed using the Statistical Package for Social Sciences, (SPSS). The mean and the standard deviation were used to see the trends in the data. The results of the study reviewed that Alcohol was frequently abused by pupils at Mindolo secondary school and that factors such as peer pressure, low self-esteem, and availability of drugs contributed to the abuse of drugs. The abuse of these drugs has led to poor performance, absenteeism, and low concentration in class amongst pupils. The other effects of drug abuse were suspensions, dropping out of school, and failure to participate in various school activities.

**KEYWORDS:** Drug abuse, academic performance, Mindolo secondary school, causes, effects, case study

### I. INTRODUCTION

Drug abuse has been a thorn issue and has been a growing problem among adolescents and the youths although it is also experienced by other age groups. Chesang (2013) indicated that drug abuse is one of the top problems confronting nations today, especially among the youths, some of them also happen to be learners and Zambia is not an exceptional. The term drug abuse refers to a substance taken for both therapeutic and abused purposes (Kwamanga, et al 2003). When the drug is taken for therapeutic purposes it is legal but when it is abused it becomes illegal. According to the World Health Organization (WHO), drug is any substance other than those required for maintenance of normal health, which when taken into the living organism, may modify one or more of its functions. Like many other countries, the situation of drug and alcohol use among young people in Zambia is growing at an alarming rate (DEC, 2012), and Schools have been posed with drug related issues of indiscipline rate. According to Ngesu, et al., (2008), there are a lot of factors in schools that can influence students to use drugs such as how the school administration manages students' affairs, high handedness, and lack of freedom. Failure to address pupils concerns as well creates stress which can lead to abuse of drugs. Drug abuse affects the freedom and development of youth who are the world's most valuable asset (UNODC, 2002).

According to the world's Drug report, a total of 180 million people abuse drugs world- wide and the majority of these are youths (Lakhampal and Agnihotri, 2007). In Zambia drug abuse prevalence has been recognized by different organizations such as the Ministry of General Education, Ministry of Health, Drug Enforcement Commission (DEC) and Faith-Based Organizations'. There has been a fight against drug abuse in Zambia through sensitization on the effects of drug abuse by various organizations in order to bring about increased knowledge on drug abuse. Despite the efforts directed towards sensitization on the effects of drugs, there has been rapid escalation of incidences of drug and alcohol abuse among school-going children.

The Zambian Drug Enforcement Commission's (DEC) report, states that out of 288 persons attended to in 2013, 159 were learners. In 2014 out of the 302 persons counseled, 176 were learners, while in 2015, 271 learners out of 415 persons were counseled for drug and alcohol abuse related problems (DEC, 2014 and 2015). From these statistics, it is evident that drugs are highly abused by the teenagers who mostly are of the school going children ages. This is supported by the United Nations Drug Control Programme (UNDCP) report which shows that 60% of students abuse drugs. In 2018, the DEC handled at least 5,000 drug-related offences which included those of 295 juveniles, aged between 11 and 17 years.



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The study aimed at finding out the factors that influence drug abuse on pupil's academic performance; it further determines the effects of drug abuse on pupils' academic performance at Mindolo secondary school and explores the common drugs abused by these learners.

### **II. LITERATURE REVIEW**

The escalating of drug abuse among pupils in Zambian schools has become a major concern. Many educators and researchers have recognized that drug abuse is a major barrier to one's Education. Masiye and Ndhlovu (2016), show evidence of drug abuse among youths and pupils in schools.

(Masiye et al 2015) further states that drugs are more likely to be used by learners in secondary schools, if they derive some form of subjective benefits. He states that in boarding secondary school learners may use drugs to provide them with entertainment when they are bored, to gather courage to do certain actions, or to reduce physical and emotional pain. According to Masiye, some learners may get involved in drug and alcohol abuse because they lack knowledge on the harmful effects of drugs, they lack resistance or refusal skills and the belief that drugs will make them think intelligently or they simply have low self-esteem

(Azuz 2012, Kassandra, 2009, Ngesu et al; 2008 Oketch, 1997), attribute drug abuse to peer pressure. Kassandra argues that despite the earnest guidance of parents, some youth succumb to pressure and influence from the peers. According to Ngesu, a friend or peer group is likely to be the source of information for drug users about the availability of drugs and the alleged effects. (NACADA, 2006) acknowledges that the peer subculture also facilitates the behavior by making the substances available and by providing an appropriate setting and instructions

Azuz (2012) asserts that young people may be under pressure from family or friends to perform beyond their capacity in any field related to academics, sports or winning over friends and under the false impression that drugs may help them. Learners in schools may influence their peers that when they take drugs, they become intelligent and perform better in class. On the other hand, Kassandra observes that poor grades are one of the major factor that leads to drug abuse among pupils and it creates a negative feeling among students, therefore, to ease the pain and low morale, students resort to drug abuse as a remedy to their failures in effort to gain self-confidence. According to (Oketch, 1997), the interest and expectation of the peer groups have an important bearing-on whether or not a person will try dependence or be tempted to taking drugs. Ondieki and Mokua (2012) found that peer influence played a major role in learners' use of drugs with 45% of alcohol users and 33% of the smokers having copied the habit from their friends.

Adelekan (2005) states that social media is a universal factor influence on drug abuse among students in developed and developing countries. This is most common in urban centers where young people are more exposed to television, internet access, radios and other forms of media which are bombarded with adverts promoting drugs like tobacco and alcohol.

Shibalika (2021) in his study 'the causes and effects of drug abuse among primary school learners in Shibuyunji district of Zambia' states that the causes of drug abuse in Shibuyunji district were peer pressure, lack of recreational activities, curiosity and amusement, lack of parental supervision, prevalence of drugs in the locality and poverty, and that the effects of drug abuse were deviant behavior, predisposing crime, drug addiction, rebellious behavior towards authority, lower academic performance and expulsion or suspension from school. He further recommends the need to strengthen guidance and counseling in schools, and to enhance communication between administration and learners about the need for drug-free school environments.

Kaluwe (2019) reveals that peer pressure, genetic, curiosity and depression were factors leading to drug abuse by school pupils hence affecting their academic performance. He further states that learners stay in communities where drugs were being sold and easily accessed and therefore, Community interventions targeting drug abuse should be put in place thereby addressing drug abuse problem and creating more positive social networking.

(Hayatbakhsh, et al 2008) states that drug abuse can result into mental health and behavioural problems. Depressive symptoms, psychosis, suicidal thoughts and attempted suicide are some of the mental health problems found to be related to drug abuse (Onyeka, et al. 2013). A study by (Sihvola et al 2008) has shown that a depressive disorder at the age of 14 years was positively associated with levels of addictive drug abuse by boys and girls.

According to the world drug report by UNODC (2014), illicit drugs undermine economic and social development and contribute to crime, instability, insecurity and the spread of HIV. The risk of dropping out of school as well as suspension of school pupils was high among school learners who use illegal drugs. It can be noted that drug abuse has always existed in the past and its consequences have had negative impacts on pupils' academic performance. The literature shows that there is need to research more and find realistic strategies to solve the problem of drug abuse among school ongoing pupils.

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## III. THEORETICAL FRAMEWORK

### Social Learning Theory

This study was informed by Bandura (1977), social learning theory. In his theory Bandura suggests that all behaviors were learnt through observation and imitation. He believes that learning is a behavioral and cognitive process, which motivates learning of behaviors and takes place in a social context (Edinyang, 2016). This theory attest to the ability of learners to observe and imitate behaviors exhibited within their environment. According to Bandura behavioral change is influenced by environment, people and behavior. This is supported by Nabayi (2014) who states that children are surrounded by many influential models, such as parents, characters on mass/social media, friends, peer groups, religion, other members of the society, and the school. Children learn from these agents of socialization by observing the behaviors and through imitation of peers. It provides a more comprehensive model that can be used to explain a wide range of behaviors in the real world. Bandura acknowledges in his social learning theory that one of the causes of drug abuse among pupils is observing and modeling. This theory supports the view that pupils abuse drugs upon observing and modeling. When pupils see their role models from movies stars to musicians or television personalities abusing drugs, they are most likely to abuse drugs meanwhile ignoring the dangers of drug abuse.

## IV. METHODOLOGY

### Research design

Descriptive survey design was used for this study. The researcher employed both qualitative and quantitative methods. The Survey research data was collected through interviews and questionnaires. The research was carried out at Mindolo Secondary School, which is located in Kitwe, Zambia and is a co - gender school.

Simple random sampling technique was used to select the pupils. The sample size was one hundred and ten participants (110). One hundred and five pupils (105) pupils were randomly selected from grade ten (10) to grade (12) and purposive sampling was used in selecting five (5) teachers.

Ninety (90) pupils answered the questionnaire whereas fifteen (15) pupils and five (5) teachers were interviewed. The respondent's sample included the following sets of data; gender, grades and age of the respondents.

The table below was used to summarize the demographic of the participant

**Table 1: Demographic of participants**

Demographic	Category	Frequency	Percentage %
Gender	Male	48	53.3
	Female	42	46.7
	Total	90	100
Age group	Below 15	6	6.7
	15-18	55	61.1
	18-20	19	21.1
	20 and above	10	11.1
	Total	90	100
Grade	Grade 10	30	33.3
	Grade 11	30	33.3
	Grade12	30	33.3
	Total	90	100

N=90 Source; pupils' questionnaire

## V. DATA COLLECTION AND PROCEDURE

Questionnaires and interviews were used to collect data. The structure of the questionnaire consisted of two parts; the demographic and questions concerning drug abuse in school. A Likert scale was used to determine some of the responses that were collected from the respondents. The variables were measured on a 1-5 Likert scale; strongly agree (1), agree (2) Not Sure (3), Disagree (4) and Strongly Disagree (5). Therefore, items with mean values below 3 implied that on average the respondents agreed/ strongly agreed to the statements. Likewise, items with mean values greater than 3 implied that on average the respondents disagreed/ strongly disagreed to the statements.

Interviews were used in order to obtain more information in relation to the causes and effects of drug abuse on pupils' academic performance.

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## VI. DATA ANALYSIS

Data was analyzed using statistical package for science (SPSS). Qualitative data was analyzed by grouping the emerging themes. Descriptive statistics was used to summarize data by finding the mean and standard deviation. Tables and a pie chart were used to interpret and display data collected.

## VII. PRESENTATION OF FINDINGS, INTERPRETATIONS

The findings were based on the specific objectives which were outlined for the study. To give direction to the study, the following research objectives were set;

- To find out factors that influence drug abuse among pupils at Mindolo secondary school.
- To determine common drugs abused by learners at Mindolo secondary school.
- To determine the effects of drug abuse on pupils’ academic performance at Mindolo secondary school.

### A. Pupils that take drugs

From the research conducted, it was realized that some pupils abuse drugs and the table below shows that pupils at Mindolo secondary school abuse drug.

**Table 2: Pupils that take drugs**

Pupils take drugs in your school	Frequency	Percentage
YES	81	90.0
NO	9	10.0
TOTAL	90	100.0

Source: pupil’s questionnaire

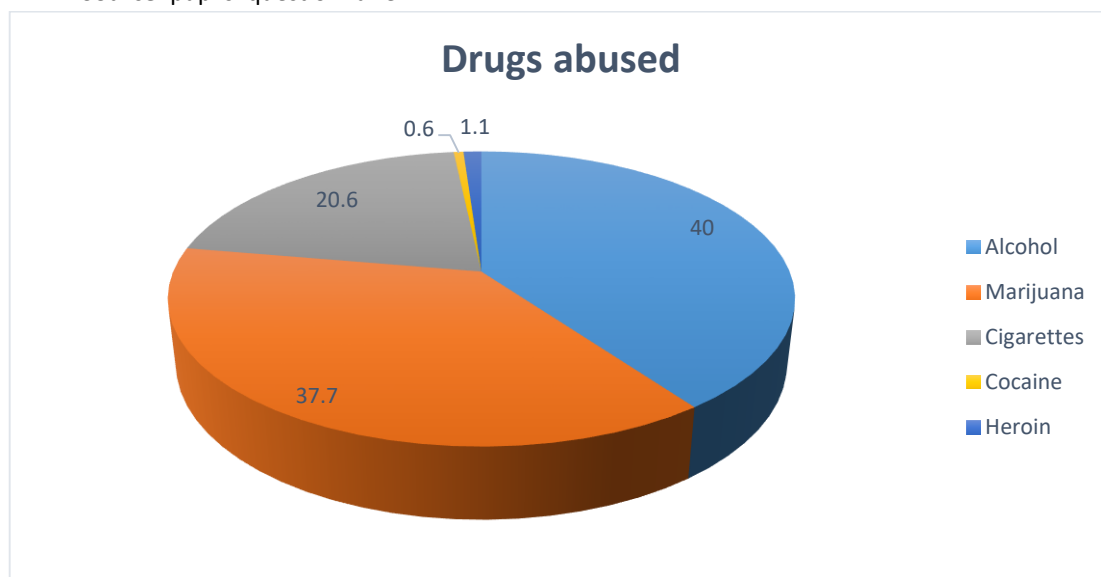
### B. Drugs commonly abused by pupils

The study recognizes the drugs commonly abused by learners as alcohol, marijuana (weed), cigarettes, cocaine and heroin as presented in the table and pie chart below.

**Table 3: Drugs commonly abused by pupils**

Names of drugs	Frequency	Percentage
Alcohol	70	40.0
Marijuana	66	37.7
Cigarettes	36	20.6
Cocaine	1	0.6
Heroin	2	1.1
		100.0

Source: pupils’ questionnaire



**Figure 1: Drugs that are abused by learners**

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From the analysis, it was found that alcohol was the most commonly abused drug by learners at 40%, followed by Marijuana at 37.7% and cigarettes at 20.6 while cocaine and heroin were less abused. It is evident that the rate at which pupils abuse these drugs at Mindolo Secondary School calls for concern because pupils often abuse these drugs as illustrated below;

**Table 4: The table below illustrates how often pupils use drugs**

How often do pupils abuse drugs	Frequency	Percentage
Very frequently	24	26.7
Often	41	45.6
Rarely	6	6.7
Not sure	21	21.1
Total	90	100.0

Source: pupils' questionnaire

### C. Factors that influence drug abuse among learners

**Table 5:**

NUMBER	ITEM	MEAN	STANDARD DEVIATION
Reason 1	Peer Pressure	1.28	.58
Reason 2	Availability of drugs in school	2.80	1.19
Reason 3	They want to perform better in school work	3.40	1.28
Reason 4	They have a lot of pocket money	3.51	1.16
Reason 5	Parental influence	3.12	1.51
Reason 6	Low self esteem	2.21	1.16
Reason 7	Idleness	2.02	.98

Source: pupils' questionnaire

The following were the causes of drug abuse which were identified

#### A. Peer pressure

Results from the table above show that peer pressure was the main reason why pupils take drugs in school. This is shown by the mean that came out to be 1.28 showing that pupils agreed to the statement. Most pupils are influenced by friends to engage in drugs. They tend to imitate the behaviors of friends. This is in agreement with Kassandra (2006) who pointed out that one of the reasons why pupils abuse drugs is due to peer pressure.

#### B. Availability of Drugs

The study also shows that availability of drugs in school is the reason why pupils engage in drug abuse as evidenced in the mean that came out to be 2.80 indicating participants strongly acknowledging that fact. Those interviewed admitted that they easily get drugs within the school and the nearby community because they have created links with people to supply them especially Marijuana and cigarettes.

#### C. Low self esteem

The study also reveals low self-esteem to be one of the reasons why pupils abuse drugs as seen by the mean of 2.21 indicating participant's agreement to the statement. In extreme addiction of these drugs, health issues creep in such as depression, withdrawal and apathy which in turn create one's low self-esteem.

#### D. Idleness

Idleness is one other reason why pupils abuse drugs as seen by the mean which come out to be 2.02 indicating participants' agreement to the statement. There is a belief by young people that once they take drugs they would get high and more alert especially when they are bored.

The study further showed that pupils disagreed to the statements as seen in the means which came out to be 3.40 for wanting to perform well in school, 3.51 for having a lot of pocket money and 3.12 for parental influence respectively

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## D. Effects of drug abuse on pupil's academic performance.

Table 6:

NUMBER	EFFECTS OF DRUG ABUSE ON PUPILS' ACADEMIC PERFORMANCE	YES	NO	TOTAL
1	Poor performance	80 88.9%	10 11.1%	90 100%
2	Absenteeism	72 80.0%	18 20.0%	90 100%
3	low concentration in class	85 94.4%	5 5.6%	90 100%
4	Dropping out of school	70 77.8%	20 22.2%	90 100%
5	Often suspended	67 74.4%	23 25.6%	90 100%
6	Failure to do home work	75 83.3%	15 16.7%	90 100%
7	Failure to take part in co-curricular activities in school	71 78.9%	19 21.1%	90 100%

Source: pupils' questionnaire

### A. Low concentration in class

The study reveals that pupils who abuse various drugs usually have low concentration in class this is in support with (Dube, et.al 2011) who stated that abuse of drugs (i.e. smoking) affects school achievement of pupils. Pupils who have smoked are more likely to decrease attentiveness, cognitive, memory functions, and have difficult remembering information and verbal learning impairment.

### B. Poor performance

Poor performance was found to be one of the effects of drug abuse on pupils' academic performance as seen by the percentage of (88.9%). This causes them to have low grades in test and examinations as such there are increased potential for dropping out of school.

### C. Failure to do homework

It's clear that pupils who abuse drugs fail to do their homework as seen by the percentage at (83.3%). Most pupils lack commitment to school for they find themselves into hide outs where such activities take place.

### D. Absenteeism

Pupils who abuse drugs in most cases have a tendency of missing classes, this can be seen from table which indicates that (80.0 %) of participants were in agreement. They tend to dodge and skip class.

### E. Failure to participate in co-curricular activities

Pupils who abuse drugs usually lack motivation as a result they do not involve themselves in co-curricular activities such as joining school clubs like jets or debate. This is in agreement with WHO (2004) who stated that abuse of drugs leads to one lacking motivation.

### F. Dropping out of school

Dropping out of school was found to be one of the effects of drug abuse on pupils' academic performance. This is seen from table which shows that most pupils at (77.8%) were in agreement with the statement.

### G. Suspension

Suspension was found to be among the effects of drug abuse on pupils' academic performance, pupils who engage in abuse of drugs are often suspended from school this can be seen from the above table were participants were in agreement with the statement (74.4%). Normally there is a high rate of truancy among pupils who abuse drugs.

## VIII. CONCLUSIONS AND RECOMENDATIONS

The research results reveals that pupils often abuse drugs at Mindolo secondary School, with alcohol being the most abused followed by marijuana (i.e. weed), cigarettes (tobacco). The study notes that some of the major reasons that have led to the abuse of drugs in school are peer pressure, idleness, low self-esteem, availability of drugs in school. Some pupils disagreed that having a lot of pocket money, wanting to perform better in school and parental influence cannot lead to abuse of drugs

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Furthermore, the study found out that abuse of drugs has a lot of negative effects on pupils' academic performances. Pupils who engage in the abuse of drugs usually experience a lot of academic challenges such as low concentration in class which leads them not to grasp simple and important concepts during teaching in class, poor performance in tests and examination, failure to do homework, absenteeism, suspension, dropping out of school and failure to participate in co-curricular activities in school.

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## Android-Based Protrainer Application Development to Support Personal Trainer Services



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**ABSTRACT:** Changes in communication technology, the development of education and people's income have increased consumer awareness to get good service. Personal trainer services that suit consumers' wishes are the main thing to attract consumers to use personal trainer services. The purpose of this research is to produce an android-based protrainer application to support personal trainer services. This research is a research and development research and development (R&D). The research data that have been collected are then processed and analyzed by qualitative and quantitative descriptive analysis. The product resulting from this research is an android-based protrainer application that has been developed with the need to improve personal trainer services. Based on the validation process carried out by experts who have assessed the android-based protrainer application product to improve personal trainer services from the usability aspect, information aspect, and appearance aspect, it is very feasible. The validation of media experts that have been developed based on aspects of media usability, aspects of media information, and aspects of media appearance is very feasible. Based on the effectiveness test, which was measured by assessing consumer satisfaction factors from tangibles, reliability, responsiveness, assurance, empathy to personal trainer services, most of them were in the satisfied category.

**KEYWORDS:** protrainer application, service quality, personal trainer.

### INTRODUCTION

The rapid competition in the personal trainer service business world lately is not only caused by globalization factors, but rather because customers are only getting smarter, price conscious, and demanding (Nagle & Müller, 2017). Advances in communication technology also play a role in increasing the intensity of competition, because it gives customers access to more information about the various products offered (Lodhia & Stone, 2017). Changes in communication technology, the development of education and people's income have increased consumer awareness to get good service.

Competition between service providers is also a challenge in running a personal trainer service business, because the personal trainer business has quite a lot of enthusiasts for consumers who want to do sports privately. Communication between personal trainers and consumers is also one of the services that can increase customer satisfaction (Alhelalat et al., 2017); (Pradeep et al., 2020). These services can, of course be in the form of information that personal trainers can provide to consumers regarding the information needed by consumers, such as complete price lists from personal trainers, availability of precise training schedules, training programs offered, and measurement data taken by personal trainers to consumers.

Technological developments have also helped to provide services easily to consumers (Hoyer et al., 2020). Fitness services using applications are becoming widely used by consumers to get exercise information easily and practically. Fitness apps using smartphones leverage persuasive technology to help individuals increase physical activity. Millions of people use fitness apps to improve their physical and mental health (Rathbone & Prescott, 2017); (Baumel et al., 2019); (Cheng et al., 2018).

Every tenant of personal trainer services will expect good service and affordable prices. However, in reality it is found that there are still many personal trainer service providers that do not meet consumer expectations. Transparency of service information is still closed without consumers being able to see the training program, tracking exercise evaluations cannot be seen by consumers, training schedules that cannot be displayed to consumers, and medical history data that is still rarely used as a reference when personal trainers create exercise programs, causing dissatisfaction, towards service.

Based on this background, the author has the idea of developing an android-based protrainer application to support personal trainer services. A protrainer application that can be a tool to help personal trainer services makes it easy for personal trainers to

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create training programs and provide training evaluations that can be directly seen by consumers and assist in providing information on different programs. This research is also expected to increase customer satisfaction with the quality of personal trainer services.

### **METHOD**

This research is a research and development research and development (R&D). The research and development procedure basically has two main objectives, namely: (1) developing the product and (2) testing the effectiveness of the product in achieving the goal. This research focuses on developing a personal trainer management model based on an android application to improve the sports industry. Application trials will be carried out by operating the android application with a smartphone. This is intended to determine the feasibility of the personal trainer management model android application to support the sports industry. The large-scale trial process was observed by android application users. At this stage, a trial was conducted on 50 personal trainers, all of which consisted of trainers who worked in a fitness center or freelance in the Special Region of Yogyakarta. The research data that have been collected are then processed and analyzed by qualitative and quantitative descriptive analysis.

### **FINDING**

This study aims to develop a personal trainer service management model system based on an android application so that the work of personal trainers can be managed easily and efficiently and assist in making sophisticated training schedules and programs. The initial product will be validated by experts or experienced experts to assess the new product that has been designed to find out its weaknesses and strengths. The initial product design that has been developed is then evaluated for feasibility testing to be used and tested.

The results from the 1st material expert showed that the percentage in the android aspect was 96% in the very good/very decent category. In comparison, the percentage in the application manual aspect was 95.2% in the very good/very decent category. From the second material expert, it was found that the percentage in the android aspect was 96% in the very good/very decent category. In comparison, the percentage in the application manual aspect was 96.4% in the very good/very decent category.

The results of the 1st media expert validation obtained the percentage on the android aspect of 97.8% with the very good/very decent category, the percentage on the application manual aspect of 97.6% with the very good/very decent category. The results of the second media expert validation obtained the percentage on the android aspect of 96.8% with the very good/very decent category, the percentage on the application manual aspect of 95.8% with the very good/very decent category.

Based on the results of a small-scale trial on the development of an Android-based personal trainer management model, it was stated that it was very good (93%). In the aspect of the assessment of the guidebooks, most of them stated that they were very good (90%). Based on the results of large-scale trials on the development of a personal trainer management model based on Android, it was stated that it was very good (86%). In the aspect of the assessment of the guidebooks, most of them stated that they were very good (85%).

The effectiveness test is intended to describe the level of personal trainer service by measuring customer satisfaction. The level of satisfaction is measured by a questionnaire consisting of 30 questions with a score range of 1-4, so that the ideal score is between 30-120. Respondents for the effectiveness test are members who are already under contract with a personal trainer who have used the Protrainer application. The number of respondents to the effectiveness test is 50 members. In the analysis of the service quality pretest and posttest data above, it was found that the value of sig, (2-tailed) was 0.000 <0.05, it can be concluded that there was a significant difference between service quality in the pretest and posttest. This means that there is a difference in service quality between before the personal trainer uses the protrainer application and after the personal trainer uses the protrainer application.

The final product of this research is an application in the form of an android application for a personal trainer management system that makes it easier for instructors to manage their business. This development will support infrastructure and tools to facilitate instructors. Furthermore, if the research has been completed and declared feasible then the product can be used en masse. After obtaining the results of large-scale trials, the final product of an Android-based personal trainer management system is obtained. The final product results can be displayed as follows:

## Android-Based Protrainer Application Development to Support Personal Trainer Services

Table 1. How to register a personal trainer account





Part	Description	Bagian	Description
	Click on "bikin akun yuk".		Fill in the requested data and select the column as a trainer.
	Fill in the requested personal data clearly and completely.		Trainer account ready.

Table 2. How to register member accounts




Part	Description	Part	Description
	Click on "bikin akun yok".		Fill in the requested data and select the column as a member.
	Fill in the requested personal data clearly and completely.		Fill in the medical history data for the last 2 months.

Table 3. On personal trainer accounts







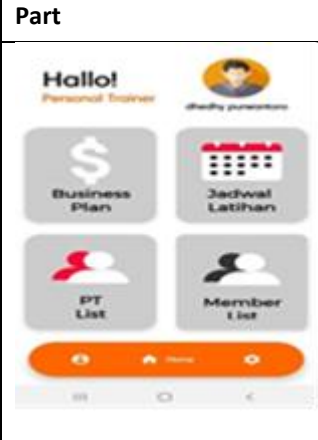

Part	Description	Part	Description
	Click on the member list feature		Click on the settings menu
	Select the member to be confirmed		Click accept personal trainer request
	Click send request to become a member		Select receive personal trainer confirmation

Table 4. Personal and Member Trainer List

Part	Description	Part	Description
	The display in this feature provides a list of personal trainer names registered in the Protrainer application. This feature can be seen by members to determine the trainer according to the goal.		The initial appearance of this feature is the same as the personal trainer list feature, but in member data it has special features such as: Par-Q, Fitness Training Log, Measurement Data.

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Table 5. Measurement data and Fitness Training Log

Part	Description	Part	Description
	Members can see the progress of the training results by looking at the measurement data carried out by the personal trainer and measured by the personal trainer.		The training log is a program created by a personal trainer for the next meeting. This feature provides information on the intensity of the exercise that will be trained at the next meeting.

### DISCUSSION

This research was conducted to develop an Android-based Protrainer application to support personal trainer services. The Protrainer application developed is in the form of a business plan arrangement that is recorded and controlled by the instructor, a training schedule that will display the availability of trainer time with members so that prospective members can determine the time that suits the instructor. Personal trainer list which displays the names of instructors registered in the application. The last feature is the member list feature that provides training program settings and member measurement data.

Based on the results of the material expert test, the average percentage of 95.9% in the very good/very decent category, while the media expert test results obtained an average percentage of 96.8% with the very good/very decent category, the results of the test. The expert indicated that the Android-based protrainer application to support personal trainer services was stated to be very good. There are several inputs and suggestions obtained in this process, such as adding the total for the business plan features, as well as creating files that are easy to open to install on smartphones.

The next stage is the trial stage which was carried out twice, namely the small group trial stage and the large group trial stage. In the small group trial, the average percentage assessment of the usability aspect was 93% in the very good / very decent category, while the results of the average percentage assessment of the information aspect were 90% in the very good / very decent category, while the results of the average percentage assessment of the aspects 90% view with very good/very decent category. Based on the results of the assessment, the value is converted based on the conversion of test scores so that it can be concluded that the results of the assessment of the usability aspect, information aspect, and display aspect are very feasible.

In the large group trial stage, the Android-based protrainer application to support personal trainer services got the results of an assessment of the usability aspect with an average percentage score of 85% with a very good/very decent category, while the results of the average percentage assessment of the information aspect were 88% with very good/very decent category, while the results of the average percentage assessment of the display aspect are 86% with very good/very decent category. Based on the results of the assessment, the value is converted based on the conversion of test scores so that it can be concluded that the results of the assessment of the usability aspect, information aspect, and display aspect are very feasible.

After revision, the effectiveness of this media is tested to find out which service quality is more effective, by measuring the level of customer satisfaction. Consumer satisfaction is the level of feeling of someone who purchases a product or service for his



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personal needs after making a comparison between the performance of the product or service provided to what is expected by the user or service actor. Satisfaction can be influenced by the user or the service actor. Satisfaction can be influenced by the services provided to consumers. If the customer is dissatisfied with a service provided, the service can be ascertained to be ineffective and inefficient. On the other hand, consumers stick to the product.

Based on the results of the study above, it was obtained that the average difference in the level of consumer customer satisfaction with the services provided by personal trainers before and after using the protrainer application, where there was an average before using the protrainer application of 88.40% and after using the application there was an average by 96.22%. These results can be interpreted that the services provided by personal trainers after using the protrainer application to improve personal trainer services to consumers have increased. This good service will of course have an impact on increasing consumers (Juanamasta et al., 2019); (Romdonny & Rosmadi, 2019); (Hong et al., 2019), because satisfied consumers will definitely extend their contracts with personal trainers (Dias et al., 2019); (Balinado et al., 2021), will even invite friends to join the exercise together. Thus good service will indirectly increase profits (Hogreve et al., 2017); (Pakurár et al., 2019).

Based on these results indicate that the development of an android-based protrainer application provides an increase in personal trainer services to consumers. To the previous description that the protrainer application can facilitate service with consumers. Provide good governance efficiency for personal trainers, especially services. Donate in the form of applications and personal trainer service manuals to become good instructors, especially for sports alumni to have business skills according to the fields studied and made it easier to develop their business. Assist prospective members and personal trainers in obtaining training information and training updates. It can be used to solve the problem of not knowing personal trainer services easily.

### CONCLUSION

The product resulting from this research is an android-based protrainer application that has been developed with the need to improve personal trainer services. It is feasible based on the validation process carried out by experts who have assessed the android-based protrainer application product to enhance personal trainer services from the usability, information, and appearance aspects. The validation of media experts that have been developed based on aspects of media usability, media information, and media appearance is very feasible. Based on the effectiveness test, which was measured by assessing consumer satisfaction factors from tangibles, reliability, responsiveness, assurance, and empathy to personal trainer services, most of them were in the satisfied category. Based on the results of this study, suggestions can be made, (1) personal trainer service providers can make choices to manage a business concisely and easily, and (2) members can get information on the development of training results from their personal trainer of choice.

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## Juridical Analysis of Testimonies of Underage Children in Perspective of Criminal Procedures



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**ABSTRACT:** This research was conducted to find out how the position of minors as witnesses in criminal procedural law and how the legal protection of minors as witnesses in a criminal act. By using the normative juridical research method, it can be concluded: 1. The position of minors as witnesses according to the criminal procedure law is not a valid evidence, and also does not have the power of proof, but the information can be used to strengthen the judge's belief and can be used as a guide as stated is in the explanation. Therefore, the value of the information given without an oath is in agreement with the others. Not having the power of proof does not mean that it cannot be considered, however, the information can be used in addition to perfecting the strength of proof of valid evidence, for example, it can strengthen the judge's conviction or be used as a guide. Whereas in the criminal justice system, children recognize witnesses as child witnesses who explain that the witness is a child who hears, sees and experiences himself. 2. Legal protection for minors as witnesses of a criminal act is quite good and supports a reshuffle of thought to provide opportunities and confidence for children to be able to testify in court. Protection of child witnesses involves all parties related to child protection regarding the rights of child witnesses which are clearly regulated in Law no. 11 of 2012 concerning the Juvenile Criminal Justice System. Following are the provisions for child protection contained in other statutory provisions, namely Law no. 35 of 2014 concerning Child Protection, Law no. 22 of 2007 concerning the Elimination of Domestic Violence, Law no. 13 of 2006 concerning the Protection of Witnesses and Victims. Institutions related to the protection of child witnesses are carried out by the Witness and Victim Protection Agency and the Child Protection Commission as well as the Special Child Development Institute, the Temporary Child Placement Institution and the Social Welfare Organization.

**KEYWORDS:** Analysis, Children, Witness Statement, Witness Protection.

### INTRODUCTION

Law enforcement is one of the efforts to create order, security, and peace in society, whether it is an effort to prevent or eradicate or take action after a violation of the law. In ensuring the rule of law for the administration of state life, the law which is the legal basis for the steps and actions of law enforcement must be in accordance with the basic philosophy of the State. According to Article 183 of the Criminal Procedure Code (KUHP) it is stated that a judge may not impose a sentence on a person unless with at least two valid pieces of evidence he obtains the belief that a criminal act has actually occurred and that the defendant is guilty of committing it. (Nur Afni, 2013) Thus, the function of evidence in evidence in court proceedings is very important, so we often hear that a crime without sufficient evidence cannot be punished with either a fine or imprisonment. Based on the provisions stipulated in Article 183 paragraph (1) of the Criminal Procedure Code (KUHP), one of the valid evidences is witness testimony. (Novelina, 2006)

Witness evidence is the main evidence in criminal cases. Almost all evidence of criminal cases always relies on examining witness statements in addition to other evidence, which is regulated in Article 184 paragraph (1) of the Criminal Procedure Code which limits that valid evidence is as follows: 1. Witness testimony; 2. Expert testimony; 3. Letters; 4. Instructions; and 5. The defendant's statement.

Furthermore, Article 184 paragraph (2) of the Criminal Procedure Code states that things that are generally known do not need to be proven. Understanding a witness is a person who can provide information for the purposes of investigation, prosecution and trial regarding a criminal case which he has heard for himself, he has seen and experienced for himself, so witness testimony is one of the evidences in a criminal case in the form of testimony from a witness regarding a crime. criminal events

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that he heard for himself, he saw for himself and he experienced for himself by mentioning the reasons and his knowledge. (Nur Afni, 2013)

There are several provisions that must be fulfilled so that the provisions of a witness can be considered valid as evidence that has evidentiary power, among others: that before giving testimony, a witness must first take an oath or promise as stipulated in Article 160 paragraph (3) of the Criminal Procedure Code. The presence of a witness at the trial is nothing but to provide information related to the case being examined. Every witness is required to provide true information and nothing other than the truth in accordance with the pronouncement of the oath or promise he made. However, although the law requires a witness to provide true information, the law itself almost completely leaves its implementation to the moral awareness of the witness concerned. In the explanation of Article 159 paragraph (2) of the Criminal Procedure Code, it is explained that being a witness is one of the obligations of everyone. Therefore something that has been determined by law as an obligation must be fulfilled. The refusal of these obligations can be referred to as a crime and therefore subject to sanctions. (Novelina, 2006).

Thus, every person is obliged to be a witness if he sees, hears or experiences himself a criminal act that is being examined before a court session. If someone who will provide testimony as a witness is an adult according to the law and has met the requirements for the validity of a witness statement as evidence as regulated in the Criminal Procedure Code, then this does not pose a problem in proving a criminal case.

However, there are times when a criminal act or a criminal act that is suspected to have occurred has only been witnessed/experienced by a minor. Especially for a child who has seen, heard or experienced a criminal act by stating the reasons for his knowledge of the criminal act being examined, by law it is not actually prohibited to be a witness at a court hearing. They can testify without taking an oath. This is regulated in Article 171 point a of the Criminal Procedure Code. The Bogor Police will investigate the shooting case of Indra Kameswari's mother. Where his own son was the key witness to the shooting by his father Abdul Malik Aziz whose real name is Muhammad Akbar. "(The victim's child) will immediately be examined. Because the child is the key witness," said Head of Criminal Investigation Unit of the Bogor Police AKP Bimatoro Kurniawan, Wednesday, September 6 2017. The child saw firsthand when his mother was shot by his father. Indra Kameswari's son also reported the incident to his neighbors after the suspect left his house. Because the child is still a minor, the police will treat him specifically in the process of examining the shooting case against his biological mother by his own father. One of them is the assistance of a psychologist in the examination. "The special treatment was accompanied by a psychologist during the examination by the Indonesian Child Protection Commission (KPAI) because he was still a minor." This study discusses how the legal provisions for the position of minors as witnesses in criminal cases and how the analysis of legal protection for minors as witnesses in criminal acts.

### RESEARCH METHODS

The methodology in this legal research describes how the procedures for a legal research should be carried out. The type of research in this thesis is normative juridical. The normative juridical concept is a research conducted by reviewing and analyzing the substance of the legislation on the subject matter or legal issue in its consistency with existing principles. The problem approach used in writing this thesis is the statute approach, the conceptual approach and the case approach.

### DISCUSSION AND ANALYSIS

#### *Characteristics of the Position of Children as Witnesses according to the Criminal Procedure Code*

Evidence is the most important factor in the trial process because it is only by proving that the fate of the defendant is determined and only by proving a criminal act can a criminal sentence be imposed. (Andi Sofyan, 2012) Evidence is a provision that regulates evidence that is justified by law that can be used by judges as a means of proving the guilt of the accused. (Yahya Harahap, 2009). According to the Regulation of the National Police Chief Number 3 of 2008 concerning the Establishment of a Special Service Room and Procedures for Examination of Witnesses and/or Victims of Crime, the examination of witnesses and/or victims who are still children in the police (in the sense that they are still under the age of 18 years) is carried out in Special Service Room. The Special Service Room (RPK) is a safe and comfortable room specifically designated for witnesses and/or victims of criminal acts including criminal suspects consisting of women and children who deserve to be treated or require special treatment, and the case is being handled at the police station (Art. 1 point (2) Regulation of the National Police Chief).

Article 171 letter a of the Criminal Procedure Code, a child who is not yet 15 years old is taken without taking an oath. This causes the child to no longer be considered as valid evidence and does not have the power of proof because it does not have formal requirements. Meanwhile, in order for a child to be used as a child witness, it must meet the requirements. The extent to which the validity of the testimony of child witnesses has evidentiary value for the judge, returning to the judge's subjective assessment because the assessment of witness evidence is generally not binding, as well as the statements of child witnesses. It

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can be said that the evidence of witness testimony as legal evidence is free and imperfect and not decisive or binding. The judge is free to judge its perfection and correctness. There is no requirement for judges to accept the truth of every witness testimony, including child witnesses. Thus, the judge can receive or convey the testimony of a child witness if the child is giving witness testimony. Even though the child's statement (a statement without an oath) is not a valid evidence, nor does it have the power of proof, it can be used to strengthen the judge's conviction as referred to in Article 169 paragraph (2), and can be used as a guide as stated in Article 169 paragraph (2). In the explanation of Article 171 of the Criminal Procedure Code.

### ***Juvenile Criminal Justice System or Underage Witness***

Positive law in Indonesia by default does not regulate the definition of a child, but there are several laws and regulations that mention the definition of a child, namely:

#### **a. Criminal Code**

The Criminal Code (KUHP) does not explicitly define the definition of a child, but it can be found, among others, in Article 45 and Article 72 which use the age limit of 16 years.

#### **b. Code of Civil law**

Article 220 of the Civil Code (KUHPerdata), provides the definition of a child is a person who has not reached the age of 21 years and is not married. According to the article, all persons who are not yet 21 years of age and have never been married are considered legally incompetent. However, Civil Law guarantees basic rights from in the womb until the child is born.

#### **c. Law Number 4 of 1979 concerning Child Welfare**

Article 1 number 2 states that a child is someone who has not reached the age of 21 years and is not married. If a person has not reached the age of 21 years but he is already married, then he is no longer a child, but as an adult.

The juvenile criminal justice system is the entire process of resolving cases of children in conflict with the law from the investigation stage to the guidance stage after undergoing a criminal process based on protection, justice, non-discrimination, the best interests of the child, respect for the child, the survival and development of the child, proportional, deprivation of liberty and punishment as a last resort and avoidance of retaliation (vide Article 1 point 1 and Article 2 of the Law of the Republic of Indonesia Number 11 of 2012 concerning the Juvenile Criminal Justice System. In the juvenile criminal justice system, children are children in conflict with the law, children who are victims and children who are witnesses in criminal acts. Children who are in conflict with the law are children who are 12 years old but not yet 18 years old who are suspected of committing a crime; Children who become victims are children who are not yet 18 (eighteen years old) who experience physical, mental suffering and or economic loss caused by a criminal act; A child who is a witness is a child who is not yet 18 (eighteen years old) who can provide information for the benefit of the legal process starting at the level of investigation, prosecution and trial regarding a criminal case that has been heard, seen and or experienced.

In the event that a criminal act is committed by a child before the age of 18 and is submitted to a court hearing after the child exceeds the age limit of 18 years but has not yet reached the age of 21, the child is still submitted to the juvenile court (Article 20 of Law of the Republic of Indonesia Number 11 of 2012 concerning the Judicial System). Child Crime). Furthermore, in the event that a child under 12 years of age commits or is suspected of committing a criminal act, the investigator, community advisor, makes a decision to hand it over to the parent/guardian or to include him/her in educational programs, coaching at government agencies or social welfare organizing institutions that handle the social welfare sector. (Article 21 of Law Number 11 of 2012 concerning the Juvenile Criminal Justice System in conjunction with, Article 67 of Government Regulation of the Republic of Indonesia Number 65 of 2015 concerning the Implementation of Diversion and Handling of Children under 12 (Twelve Years Old).

In adult cases (aged 18 years and over) each level of examination does not need to be accompanied by a parent/guardian, but in cases where a child is in conflict with the law it is necessary to be accompanied by a parent/guardian. Protection should be given since the criminal justice process begins. The criminal justice process is a juridical process, where there must be an opportunity for people to discuss, fight for certain positions, express interests by various parties, consider them and where the decisions taken have certain motivations. So that when the proof stage is needed evidence that meets both material and formal requirements so that the judge's conviction is formed which is one of the considerations in making a decision.

### ***The Position of Child Witnesses in the Juvenile Criminal Justice System Act***

Protection of children who are witnesses in the criminal justice process cannot be separated from the legal context of child protection. The law which is the highest rule must be followed by the community in carrying out social interactions, and also the state authorities as the organizers of state and community life. Law as concepts, ideas, and social ideals that are inherently inherent are the radiance of a value system that lives in the hearts of people. Law rests on the social base where it grows, applies and develops. Thus the law is not a value-free rule, where the benefits or harms depend solely on the person implementing or

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implementing it. The United Nations General Assembly Declaration dated November 20, 1989 stated that children have the right to obtain special protection, opportunities and facilities that enable them to develop in a healthy and natural manner in conditions of freedom and in accordance with human dignity, have citizenship from birth, receive social security including nutrition. Adequate health services, receive education, obtain legal protection, both against all forms of neglect, cruelty and oppression, as well as against acts that take the form of discrimination.

In a child who is a witness in a criminal act, a child can experience pressure and conditions that are not in accordance with his mental and mental readiness. The possibility of retaliation from the perpetrators and the very risky position of the witness, does not rule out the possibility of a change no longer as a witness but also as a perpetrator. The state's juridical commitment to protect its citizens is mentioned in the fourth paragraph of the 1945 Constitution, which is further elaborated in Chapter XA on Human Rights (HAM). Specifically for legal protection of children, Article 28 B paragraph (2) of the 1945 Constitution states: "Every child has the right to survive, grow and develop and has the right to protection from violence and discrimination". The rights stated in Article 28 are certainly not monopolized by adults, but also children, some of these rights are: 1). the right to live and defend life and life (Article 28 A of the 1945 Constitution). 2). the right to recognition, guarantee, protection and fair legal certainty and equal treatment before the law (Article 28 D paragraph (1) of the 1945 Constitution). 3). The right to personal protection, honor, dignity, and property under his control as well as the right to a sense of security from the threat of fear to do or not do something which is a human right (Article 28G paragraph (1) of the 1945 Constitution). 4). the right to be free from torture or treatment that degrades human dignity (Article 28 G paragraph (2) of the 1945 Constitution).

The SPPA Law regulates the protection of the safety guarantee for children who are witnesses in Article 90 Paragraph (1) point (b) which states "safety guarantees, both physical, mental, and social". Security guarantees are needed as a child who is a witness in a criminal justice trial. As one of those whose statements become evidence, there is a tendency that the testimony given by a child will harm the perpetrator as well as benefit the victim. Therefore, the existence of witnesses may be threatened by other parties who feel aggrieved by the testimony. As a tangible form of protection for the safety or security of child witnesses, the SPPA Law provides flexibility for witnesses to give their required testimony in the trial process. Article 58 paragraph (1) states that when examining the Child of the Victim and/or the Witness, the Judge may order that the Child be brought out of the courtroom; (2) At the time of examination of the Child Victim and/or Child Witness as referred to in paragraph (1), the parents/guardian, advocate or other legal aid provider, and the Community Counselor are still present. In the event that the Child Victim and/or Child Witness is unable to attend to give testimony before a court session, the Judge may order the Child Victim and/or Child Witness to have their statements heard: Investigators or Public Prosecutors and Advocates or other legal aid providers; or; b) Through direct remote examination using audiovisual communication tools accompanied by parents/guardians, community counselors or other companions.

The trial process in the juvenile criminal justice system does not require that the child of the victim and or child of a witness is always present in the courtroom. If the judge sees that there is a separation of interests in protecting children, it is intended to protect and protect children who are in conflict with the law so that children can meet their long future and provide opportunities for children so that through coaching they will acquire their identity to become independent, responsible, and useful human beings for themselves, their families, society, nation and state. Child protection also includes activities that are direct and indirect from actions that harm children physically and/or psychologically. The best interest of the child is that all actions and decisions concerning children, whether carried out by families, communities or law makers, the survival and development of children must always be the main consideration. Respect for children's opinions is to give freedom to children in order to develop their creativity and intellect (the power of reason). Respect for children's rights to participate and express opinions according to the child's age level in making decisions, especially when it comes to matters that affect children's lives. The survival and development of children are the most basic rights for children which are protected by the state, government, community, family, and parents. Every child has the right to be protected from harmful actions, causing mental, physical and social suffering.

### CONCLUSION

The conclusions from the results of the research and discussion are:

1. Proving the testimony of minors is an important factor in the examination process until the court process because it is with proof that the defendant's verdict is determined and only the proof of a criminal act can be imposed with a criminal sentence. Which is in Law Number 13 of 2006 concerning the Protection of Witnesses and Victims that providing information to investigators must be free from all kinds of threats, pressures, both in any form and from anyone. It is also regulated in Article 171 letter a of the Criminal Procedure Code if a child is not yet 15 years old, his testimony is taken without taking an oath. This causes the child to no longer be considered as valid evidence and does not have the power of proof because it does not have



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formal requirements. And in order for children to be used as child witnesses, they must meet certain requirements. The extent to which the validity of the testimony of child witnesses has evidentiary value for the judge, returning to the judge's subjective assessment because the assessment of witness evidence is generally not binding, as well as the statements of child witnesses. It can be said that the evidence of witness testimony as valid evidence is free and imperfect and not decisive or binding. The judge is free to judge its perfection and correctness. Even though a child's statement (a statement without an oath) is not a valid evidence, nor does it have the power of proof, it can be used to strengthen the judge's conviction as referred to in Article 169 paragraph (2) and can be used as a guide as contained in Article 169 paragraph (2). Explanation of Article 171 of the Criminal Procedure Code.

2. The testimony of witnesses at the trial given by the child in a proof of a criminal case in which the judge is guided by the judge's belief that emerges from the instructions and cannot be separated from the applicable regulations. And also these regulations, both those regulated in the Criminal Procedure Code and other laws that specifically regulate. Because the narrative or information given by a child witness can have evidence value which in itself raises the strength of evidence that can be used as a guide or strengthen the judge's belief in making a decision.

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## A Study of customer's Satisfaction Towards online Shopping in Gorakhpur



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**ABSTRACT:** Online shopping is the process of shopping where customers interacted to online retailers through website of mobile apps by using internet and computer system or smart phones to buy product or service. In online shopping the customers can buy the products or services from anywhere and anytime (24X7). To satisfying customer is the key for organizational success because satisfied customer becomes the loyal customer. So it is important to measure the customer satisfaction level, because satisfied customers will make recurring purchases and provide recommendations to other customers, thus it helps in generating profit for a particular online seller. The study reveals the main factors attracting customers for online shopping in. In this research paper the study also focused on the satisfaction level of customers towards online shopping and the factors behind customer's satisfaction. In this study it is also trying to find out the factors which create problems in online shopping.

**KEYWORDS:** Online Shopping, Customer satisfaction, factors attracting customers.

### INTRODUCTION

Online shopping is part and form of e-commerce where buyer purchases the product and services using computer, tablets or smart phones over internet. Customer is the king of market and the success of any business depends on the satisfaction of customer. An unsatisfied customer detains more customers from the particular brand and product and a satisfied customer helps in adding more customers for the same product or brand. This is the reason that companies focus on customer's satisfaction on priority. Online shopping has big impact on customer's satisfaction and it has more focused on customer attraction towards buying product online. For knowing about customer satisfaction, the companies time to time take feedback from customer's online using questionnaire or through rating scale.

### OBJECTIVES

- To study the main factors attracting customers towards online shopping.
- To find out the satisfaction level of customers who shop online.
- To explore the factors of satisfaction of customer.
- To identify the problems faced by online shopper.

### RESEARCH METHODOLOGY

The research is based on primary as well as secondary data. Primary data has been collected through questionnaire and personal interview and secondary data is collected through different sources like journals, books, newspapers and different websites etc. Due to the limitation of time and resources the sample size is taken as 100 respondents in the survey from different age group and from different profession. The Sample is taken from different areas of Gorakhpur district. The method used for primary data collection is convenience sampling.

### LITERATURE REVIEW

Dr.V. Dhayalan et all (2020) find in their study that the satisfied customer's percentage is more and the reason behind their satisfaction on online shopping are availability of information about product and its comparability with similar product. They also

## A Study of Customer's Satisfaction towards Online Shopping

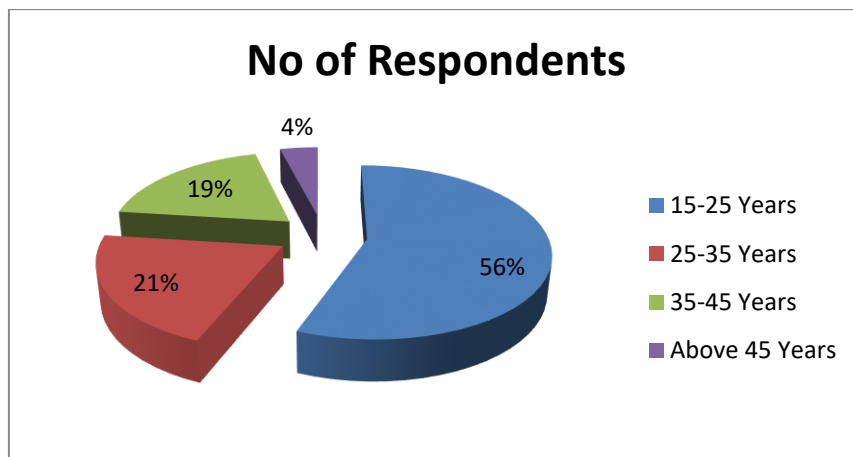
states that attractive price and offers and quality of the product attract customers to shop online. The major threats for online shoppers are payment security.

Dr. Pratima Merugu and Dr. Vaddadi Krishna Mohan (2020), Stated in their study that factors like product variety, product availability, rapid delivery and services are the most attractive factor for online shopping for the customers. They also examine that service reliability, responsiveness and cash on delivery are the factors which contribute in more satisfaction to the consumers. Parvathy. R. Nair (2019), Explain in his study that majority of customers satisfied with service they have experienced while shopping product online. He also stated that quick grievance handling and security provide more satisfaction to customers. He found in his study that product variety is a big factor which attract customer to shop online. He found that there should be chance for online fraud as per customers.

### DATA ANALYSIS

#### 1. a. Age Group

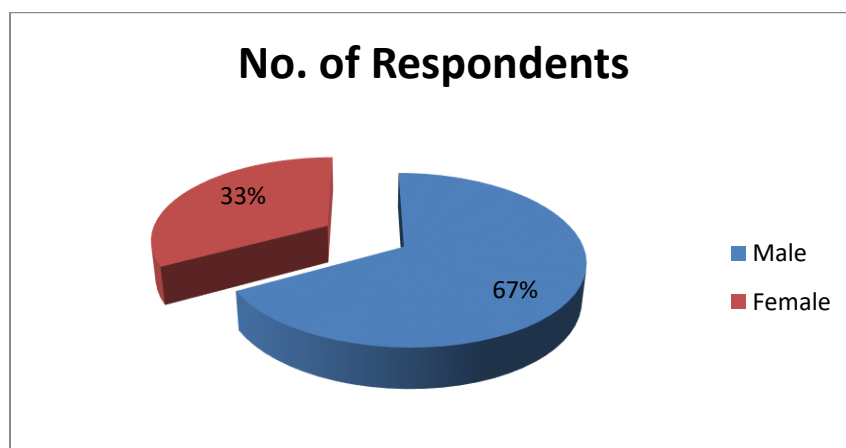
Age Group	No of Respondents
15-25 Years	56
25-35 Years	21
35-45 Years	19
Above 45 Years	4



In the survey of 100 respondents, we have found that 56% of the respondents belong to the age group of 15-25 years, 21% belongs to 25-35 years of age group, 19 % belongs to 35-45 years of age group and rest 4% are above the age of 45 years.

#### b. Gender:

Gender	No. of Respondents
Male	67
Female	33

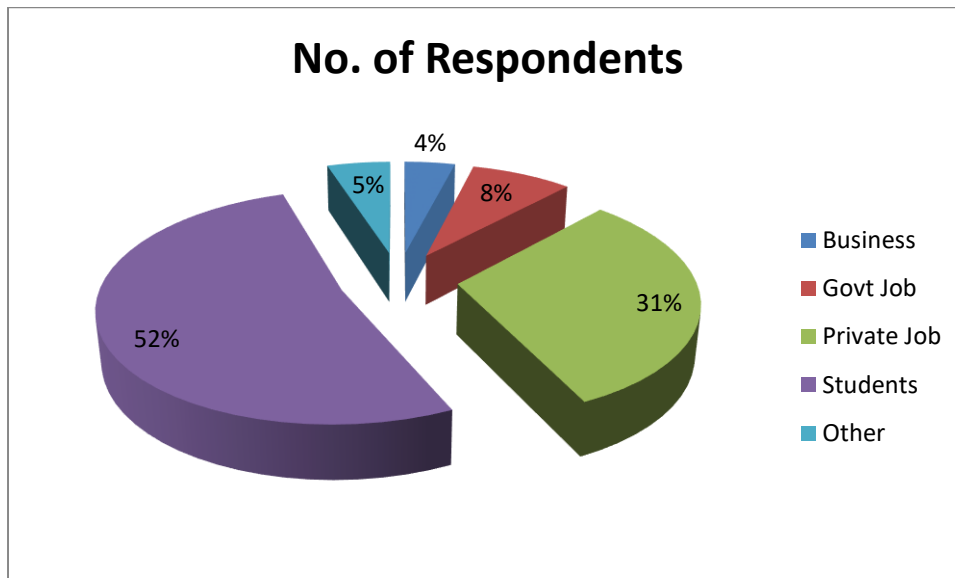


## A Study of Customer's Satisfaction towards Online Shopping

In the survey 65% of respondents were male and rest 35% was female. So majority of respondents was male.

### c. Occupation:

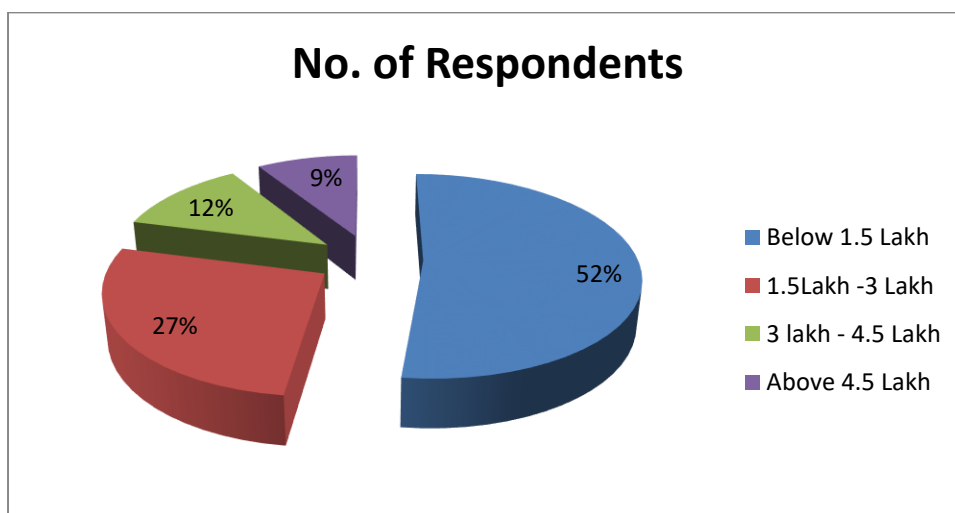
Occupation	No. of Respondents
Business	4
Govt Job	8
Private Job	31
Students	52
Other	5



It is found in the study that 52% of the respondents were students, 31% of respondents were private job holder, 8% were government employees, 4% belongs to self-employed in business and rest were in other occupation.

### d. Income Group:

Income Group	No. of Respondents
Below 1.5 Lakh	52
1.5Lakh -3 Lakh	27
3 lakh - 4.5 Lakh	12
Above 4.5 Lakh	9

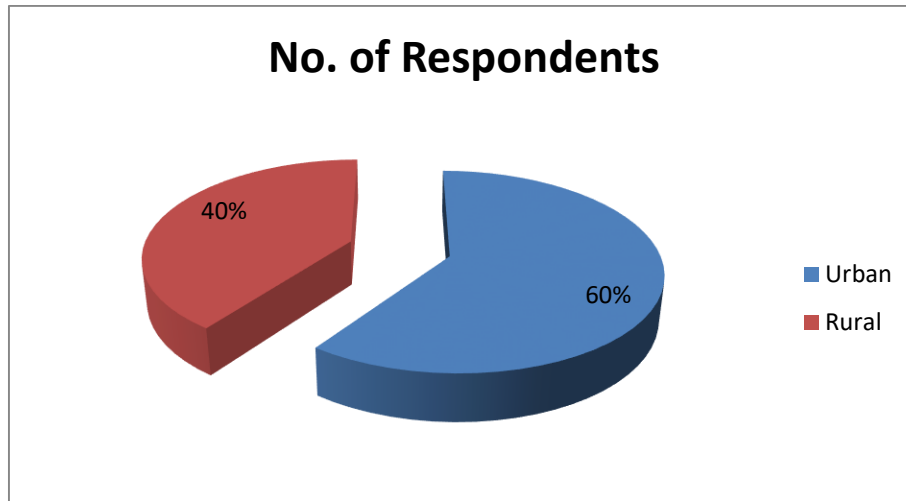


## A Study of Customer's Satisfaction towards Online Shopping

In the survey 52% of the respondents belong to the income group of below 1.5 lakh because most of the respondents were students. In it 27% of respondents having income between 1.5 lakh to 3 lakh, 12% respondents having income between 3 lakh to 4.5 lakh and rest 9% of respondents were earning more than 4.5 lakh rupees.

### e. Residential Area:

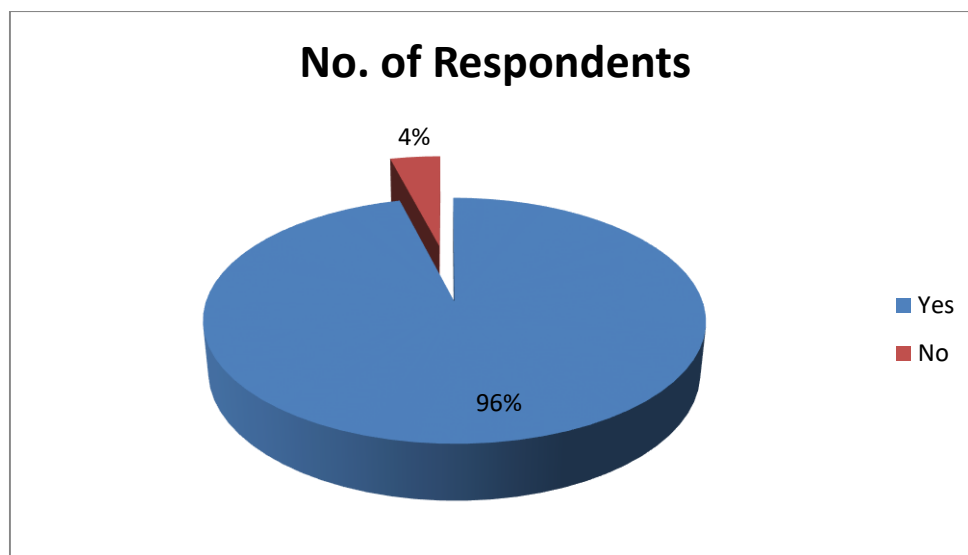
Residents	No. of Respondents
Urban	60
Rural	40



In the survey 60% of the respondents residing in urban area while 40% respondents were residing in rural area.

### 2. Online Purchase:

Do you purchase product online?	No. of Respondents
Yes	96
No	4

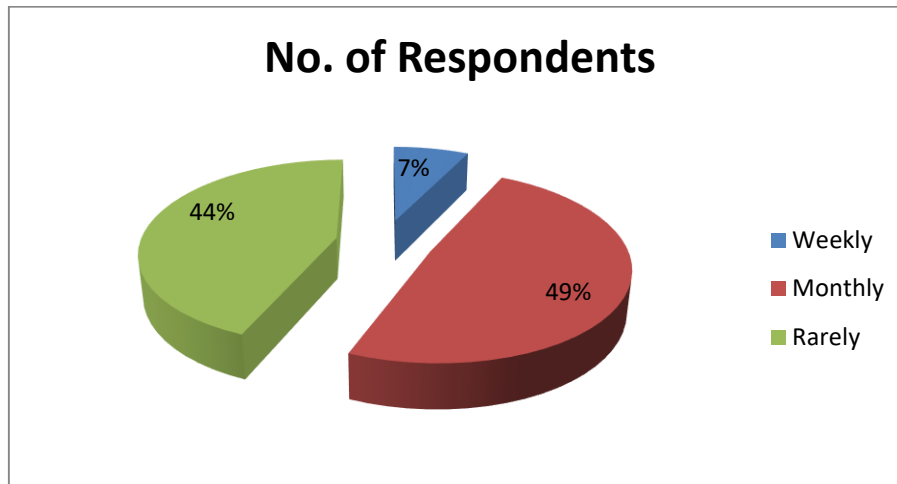


In the survey 4% of respondents told that they have not making purchase online while 96% of respondents told that they have purchase goods and services online.

## A Study of Customer's Satisfaction towards Online Shopping

### 3. Frequency of online shopping

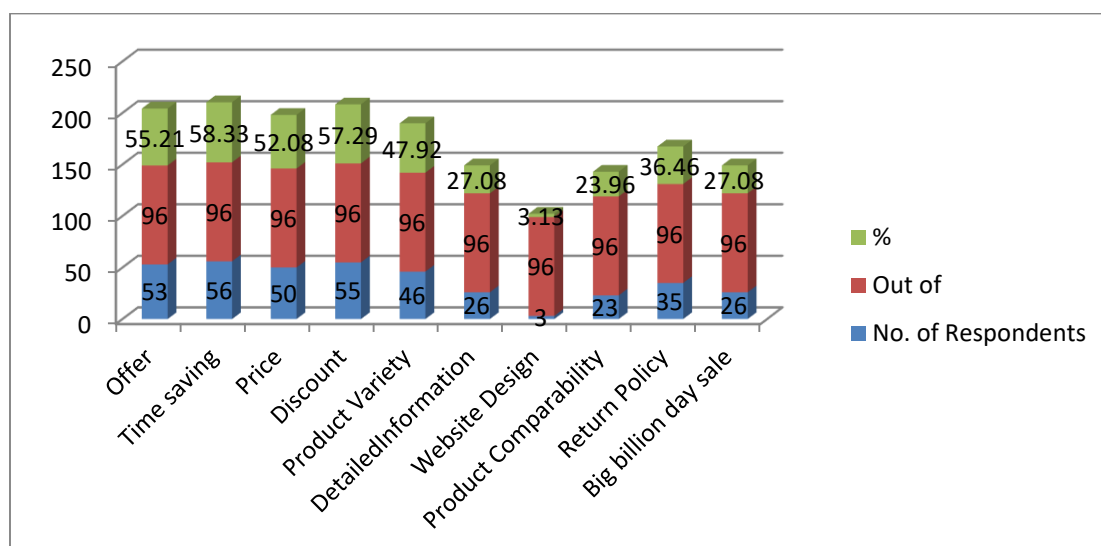
Frequency of Online Shopping	No. of Respondents
Weekly	7
Monthly	47
Rarely	42



It is found in the survey that only 7% respondents were purchasing weekly, 49% respondents were purchasing monthly and 44% of respondents purchase rarely through online mode. So if we talk about the frequency of purchase in online mode it is very poor.

### 4. Factor Attracting for online shopping

Factor attracting online shopping	No. of Respondents	Out of	%
Offer	53	96	55.21
Time saving	56	96	58.33
Price	50	96	52.08
Discount	55	96	57.29
Product Variety	46	96	47.92
Detailed Information	26	96	27.08
Website Design	3	96	3.13
Product Comparability	23	96	23.96
Return Policy	35	96	36.46
Big billion day sale	26	96	27.08



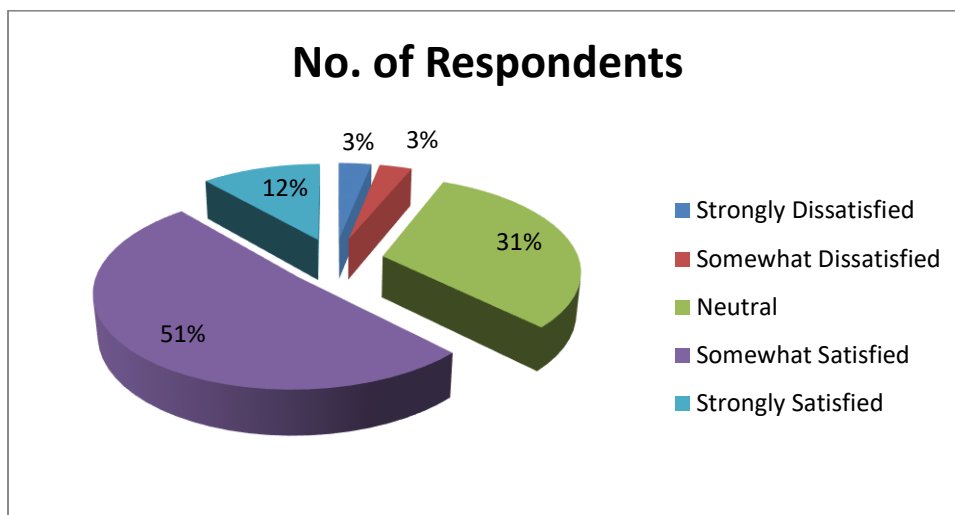


## A Study of Customer's Satisfaction towards Online Shopping

When question is asked about the factors which attract more to purchase online, 58.38% of the respondents told that they prefer online purchase because it save time, 57.29% respondents told that discount is more attractive factor to purchase online. 55.21% respondents prefer it by offer, 52.03% prefer online shopping by attractive price, 47.92 % respondents reply that product variety is more attractive factor to buy online. 27.08% of respondents told that they prefer because of availability of detail information about the product while only 3.13 % told that they prefer to purchase online because of website design. 28.96% respondents told that product comparability is attracting more while 36.46% prefer online shopping because of return policy of the goods by online retailers. Big billion day sale scheme also attract customers to shop online and the percentage of such respondents in the survey was 27.08.

### 5. Satisfaction with product quality

Satisfaction with quality of product	No. of Respondents
Strongly Dissatisfied	3
Somewhat Dissatisfied	3
Neutral	30
Somewhat Satisfied	49
Strongly Satisfied	11

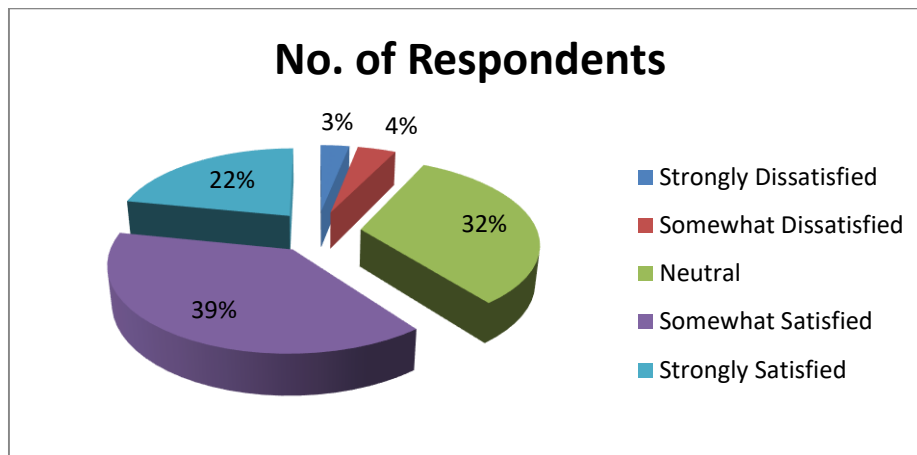


If we talk about the satisfaction level with product quality, 51% respondents somewhat satisfied with the quality of product while 30% respondents were neutral about the quality. 12% of the respondents were strongly satisfied with the quality of product while 3% are strongly dissatisfied and 3% were somewhat dissatisfied with the quality of product.

### 6. Satisfaction level with product delivery time:

Satisfaction level with product delivery time	No. of Respondents
Strongly Dissatisfied	3
Somewhat Dissatisfied	4
Neutral	31
Somewhat Satisfied	37
Strongly Satisfied	21

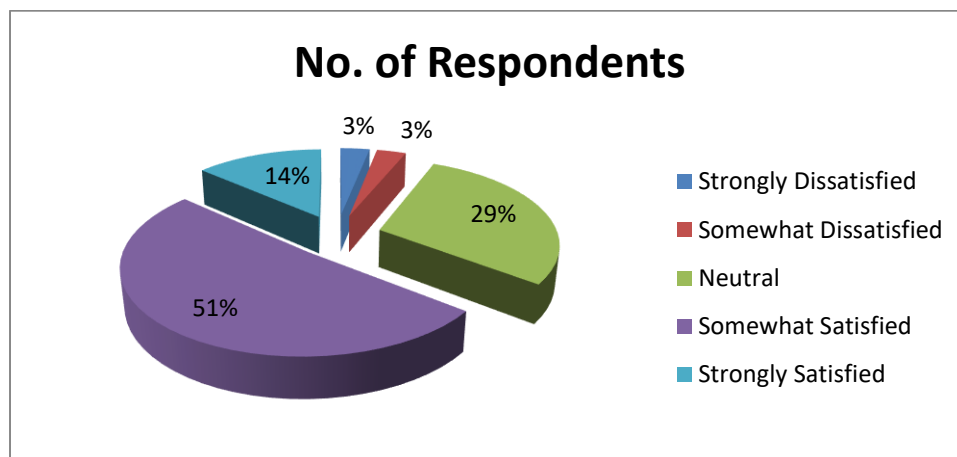
## A Study of Customer's Satisfaction towards Online Shopping



In the survey it is found that 39% of the respondents were somewhat satisfied with the delivery time of the product while 22% respondents were strongly satisfied with the product delivery time. 32% of the respondents were neutral about the delivery time. 4% respondents were somewhat dissatisfied with product delivery time while 3% respondents were strongly dissatisfied with product delivery time.

### 7. Satisfaction level with price of product

Satisfaction level with price of product	No. of Respondents
Strongly Dissatisfied	3
Somewhat Dissatisfied	3
Neutral	28
Somewhat Satisfied	49
Strongly Satisfied	13

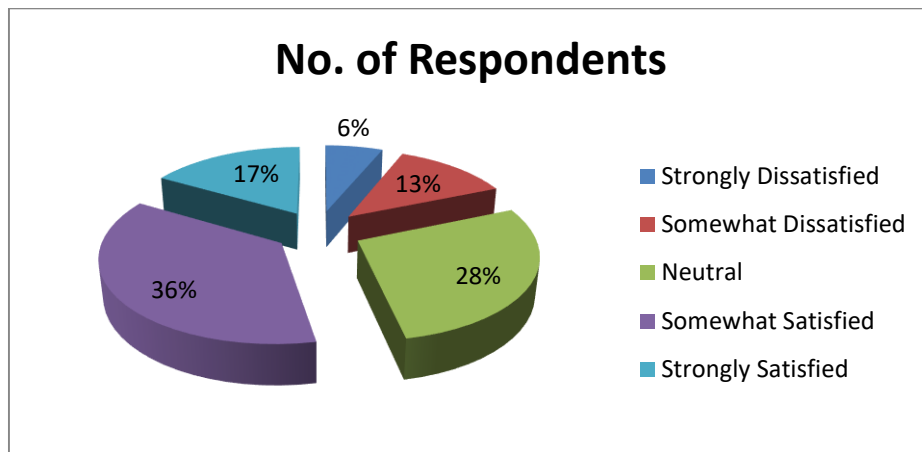


Only 14% of the respondents were strongly satisfied with the price of product while 51% of the respondents were somewhat satisfied with the price of product. 29% of the respondents were neutral satisfaction about the price of product. 3% respondents were somewhat dissatisfied while 3% respondents are strongly dissatisfied about the price of the product.

### 8. Satisfaction level with warrantee and guarantee of product

Satisfaction level with warrantee and guarantee of product	No. of Respondents
Strongly Dissatisfied	6
Somewhat Dissatisfied	12
Neutral	27
Somewhat Satisfied	35
Strongly Satisfied	16

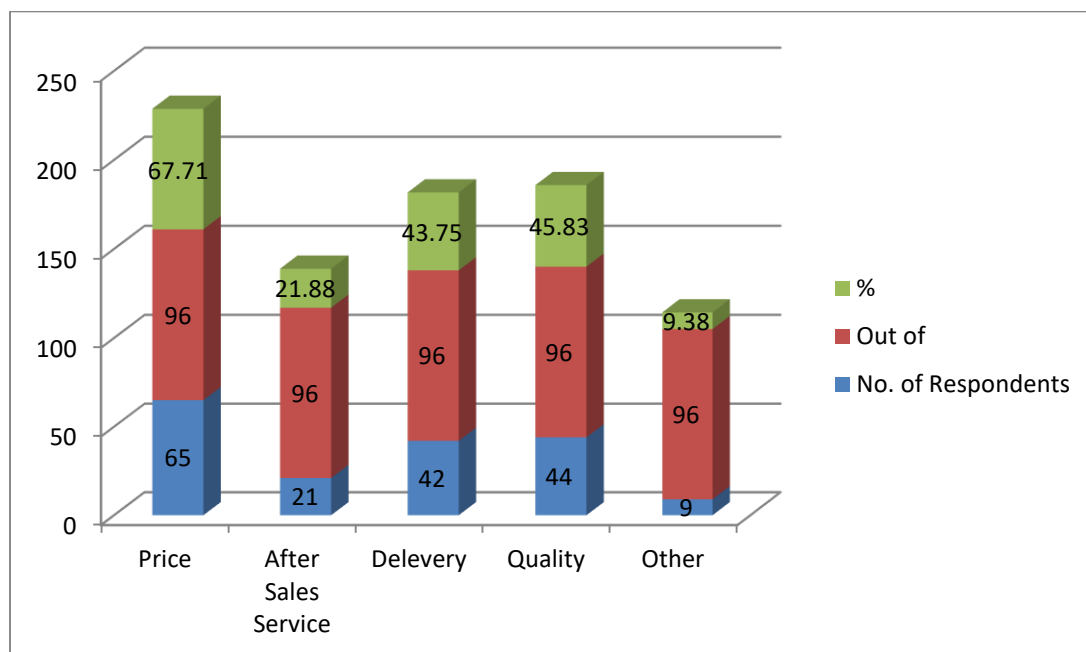
## A Study of Customer's Satisfaction towards Online Shopping



When we try to know the satisfaction level of respondents about guarantee and warranty of the product, 17% respondents respond that they have strongly satisfied with it while 36% respondents reply that they have somewhat satisfied. 28% respondents were neutral about guarantee and warranty of product. 13% of respondents reply that they have somewhat dissatisfied while 6% reply that they have strongly dissatisfied about guarantee and warranty of the product.

### 9. Factors which provide more satisfaction in Online Shopping

Factors which provide more satisfaction in Online Shopping	No. of Respondents	Out of	%
Price	65	96	67.71
After Sales Service	21	96	21.88
Delivery	42	96	43.75
Quality	44	96	45.83
Other	9	96	9.38

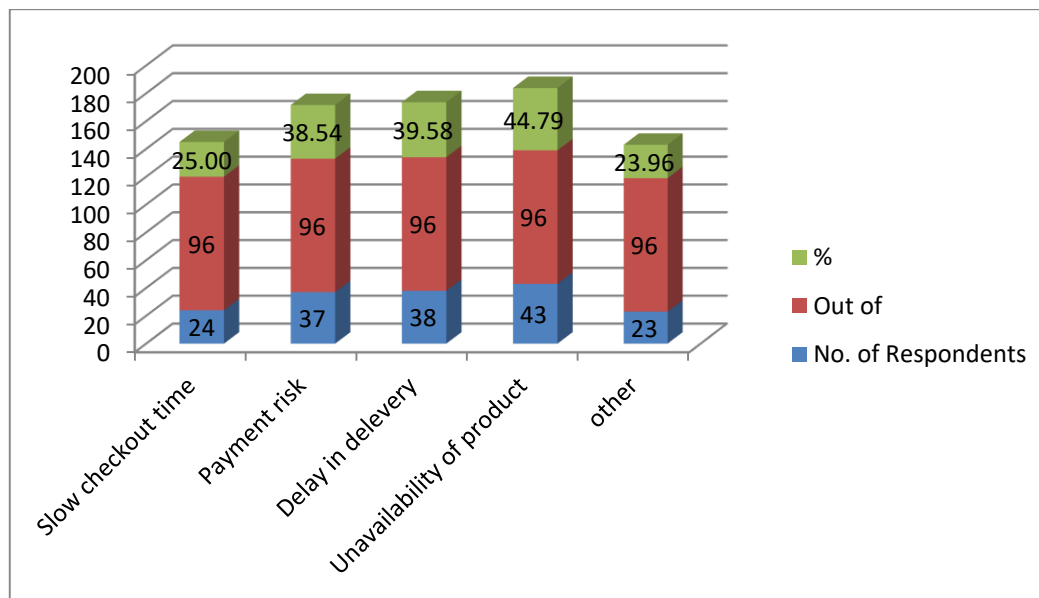


In the study it is found that 67.71% of the respondents were satisfied with the price of the product in online shopping 45.83% satisfied with quality of product, 43.75% of the respondents were satisfied with delivery time 21.88% were satisfied with after sale service and 9.38% were satisfied with other services.

## A Study of Customer's Satisfaction towards Online Shopping

### 10. Facing problems while purchasing online

Facing problems while purchasing online	No. of Respondents	Out of	%
Slow checkout time	24	96	25.00
Payment risk	37	96	38.54
Delay in delivery	38	96	39.58
Unavailability of product	43	96	44.79
other	23	96	23.96



In the study it is found that 44.79% of the respondents are claiming that they have facing more problems related to product unavailability, 39.58% told that they have facing problem of delay in delivery of product, 38.54% respondents told that they have facing the problems of payment risk in online shopping 25% facing problem related to slow checkout time while 23.96% respondents told that they have facing other problems while shopping online.

#### Finding:

- The majority of the respondents belong to the age group of 15-25 years.
- Most of them were male.
- A large amount of the respondents were students of UG and PG courses.
- The largest part of the respondents belonging to income group of below 1.5 lakh.
- Most of the respondents were from urban area.
- 96% of the respondents having the experience of online shopping.
- Majority of the respondents were shopping online monthly and few of them shopping weekly.
- Highly attractive factor to motivate customers to buy online was time saving, offer, discount, and price and product variety while less attractive attribute for online shopping was website design and product comparability.
- If we talk about satisfaction level of product quality wise then most of the respondents were somewhat satisfied.
- Majority of the people somewhat satisfied with the delivery time of the product.
- Most of the respondents were somewhat satisfied with the price of the product while shopping online.
- Maximum respondents were somewhat satisfied with guarantee and warranty of the product which they bought online.
- More satisfaction providing factors in online shopping was price of the product, delivery time, and quality of the product while less satisfaction providing factors in online shopping were after sales service and other factors.
- Unavailability of products and delay in delivery is most problem facing factors to the online shoppers while slow checkout and other factors provide less problems in online shopping.

#### Suggestions:

- As per the study the online retailers should focus on the frequency of purchase and work to improve it.
- It is also suggested that producer should focus on quality.

## A Study of Customer's Satisfaction towards Online Shopping

- Delivery should be reduced.
- It is also suggested that retailers of online shopping should maintain sufficient level of stock of the product to maintain supply as per demand.
- The improvement is needed in after sale services.

### Limitations:

The less availability of time and the data collected to this study from only 100 respondents is the major limitation of this study. We cannot predict whole population of Gorakhpur through this sample size. The sampling method was convenience sampling.

### CONCLUSIONS

From the above analysis it is concluded that online shopping provide an alternative to go in the market and buy the product. Today's the people having less time to go to the market physically because of their busy schedule, hence online shopping give them opportunity to buy the product anytime and from anywhere through computer, laptop or smart phones over internet. Offers, discount, product delivery and attractive price attract people to buy the product and services online. Online shopping has better future if it solves the problems like unavailability of product, infrastructure facility for online shopping, payment risk etc. at last we can say that online shopping is a good tool in the hand of online purchaser.

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## Quantitative Accounting of Agricultural Land in the Territory of Kashkadarya Region through Qr -Code



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**ABSTRACT:** Accounting of agricultural land areas in the world in software belonging to the family of geoinformation systems is directed to the formation of a unified geodatabase and the implementation of geostatistical analyzes of land accounting, the development of applications for the integration of information using programming languages, and the development of new scientific and technical solutions for their mobilization. scientific and research works are being carried out. In this regard, special attention is paid to the research aimed at the development of special geoportals that geovisualization the interactive geographic location of land areas. In this article, the need for land accounting, issues of quantitative land accounting in Kashkadarya region, as well as recommendations for land accounting in modern methods are given.

**KEYWORDS:** land account, agricultural land, land information, gray land, pastures, tree groves, QR-code, ilu-qr.uz.

**INTRODUCTION:** In the world is available 51 billion to 14.9 billion ha of land area. the land area is covered with land, of which 17.23 million ha. the land area is considered agricultural land. This is 17.23 million ha. 7.55 million ha of land area. the use of innovative technologies in the accounting and formation of irrigated agricultural lands in the land area is taking a leading place. High-accuracy global irrigated land accounting requires the implementation of interactive user and government services. In this regard, it is important to keep account of irrigated land areas on the basis of modern techniques and technologies, geovisualization of information about land users in the geodatabase, and interactive use of information in the geodatabase.

A land information system is a component or other form of an economic information system, because its content is a description of multi-purpose processes associated with land use and protection.

The methodological basis of land information consists of processing, researching, analyzing, preparing and regulating the information characteristics of the state of the state land fund, its use and protection processes, as well as improving the methods and methods of reflecting the quantitative and qualitative indicators of these processes. This leads to lower costs and enables the collection and processing of various data with precise calculation results necessary for land use planning.

Quantitative indicators of agricultural land of Kashkadarya region were analyzed as a research object. The 2022 land report on the distribution of the land fund by categories and types is based on the land report prepared in the previous year, and changes in the amount of land for one year are reflected.

As of January 1, 2022, total arable land is 675,702 hectares, including irrigated 417,283 hectares, perennial trees are 38,923 hectares, brown lands are 21,900 hectares, pastures are 1,406,764 hectares, and total agricultural land is 2,143,289 hectares.

In 2022, according to the decree of the President of the Republic of Uzbekistan adopted on the basis of the "Land Code" and the current laws, as well as the decisions of the regional governor, the area of irrigated arable land decreased to 17 hectares, dry arable land to 121 hectares, and pasture land to 168 hectares due to the allocation of land for non-agricultural purposes ( Figure 1).



## Quantitative Accounting of Agricultural Land in the Territory of Kashkadarya Region through Qr -Code

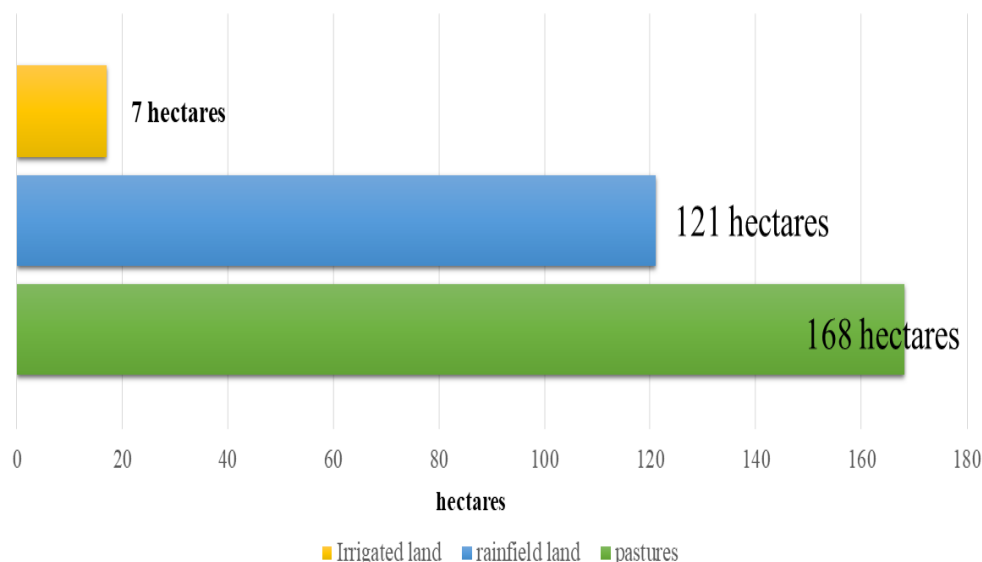


Figure 1 . Changes in land types in 2022

the irrigated agricultural land in the districts of Kashkadarya region as of January 1, 2022 (Fig. 2).

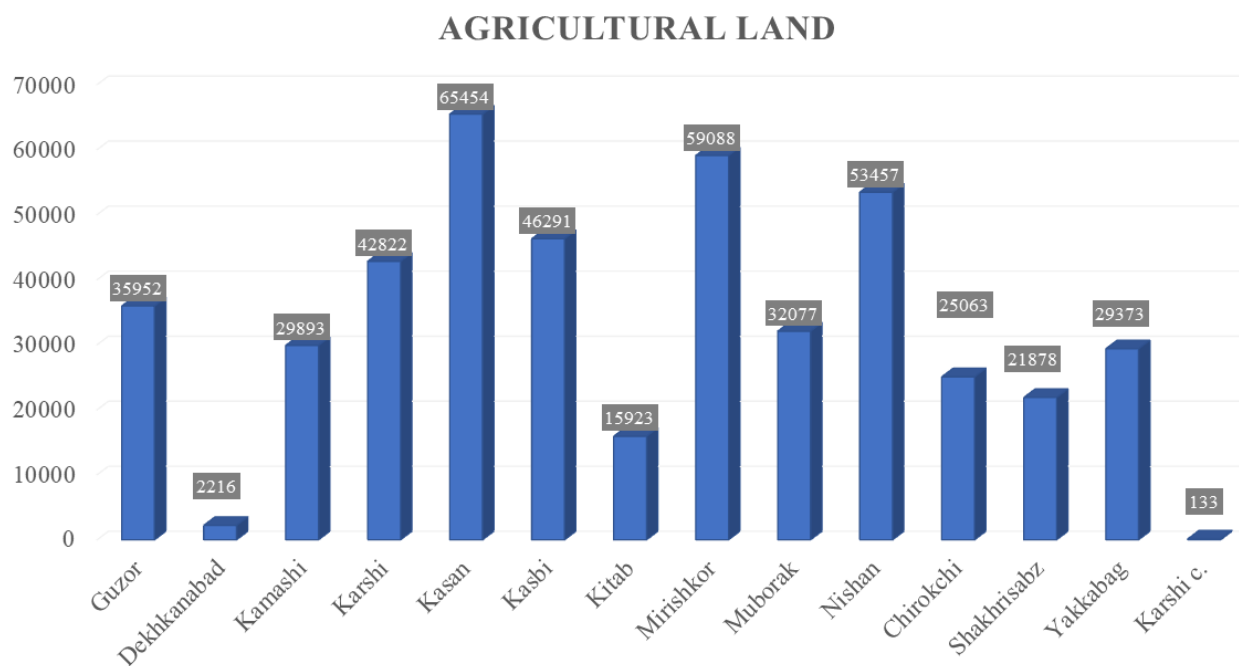


Figure 2. Irrigated agricultural lands of districts of Kashkadarya region

Today, information is required not only completeness , reliability , but also speed . A QR-code system is a fast data provider that requires a scanning device (mobile phone, camera, or hand-held scanner) is convenient and fast algorithmization and allows coding . In the field of agriculture, the QR-code system has been applied to agricultural products. But until now, it has not been implemented in the fields of land formation, land cadastre and land monitoring in our country.

Therefore, during scientific research, it was possible to obtain information about land users and land contours interactively by creating a database of land users based on the QR-code system and visualizing information on the quantity and quality indicators of irrigated land areas.

QR-code system of land contours was developed in the section of land users in the Alisher Navoi massif, Guzgor district, Kashkadarya region. Web portal address 172.0.0.1:8003 was used to create QR-code system. With the help of the web portal, a special QR-code was created for the user from any place and compiled for geovisualization on an electronic digital map.

To use information about land users as a result of their work ilu-qr.uz site was created. Through this site, it was possible to view information about land contours and perform analytical work (Fig. 3).

## Quantitative Accounting of Agricultural Land in the Territory of Kashkadarya Region through Qr -Code

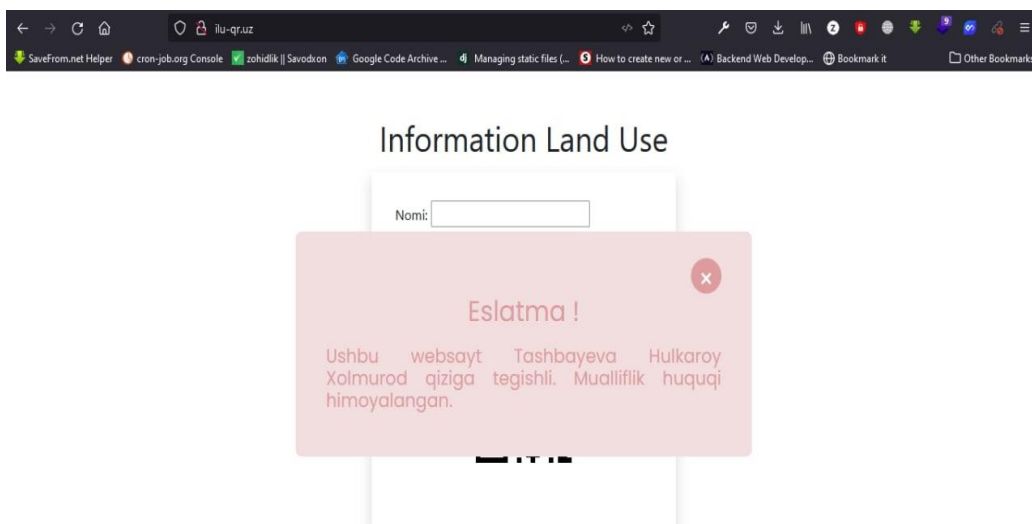


Figure 3. The appearance of the site

During the research [ilu - qr . uz](http://ilu-qr.uz) website has been developed. With the help of this website, a database of information about 30 land users in Alisher Navoi massif, Guzor district, Kashkadarya region, was developed based on the QR-code system.



Figure 4. Tablets created on the basis of the QR-code system

### CONCLUSION

Further increasing the transparency of information by implementing the QR-code system in the field of agriculture also shows that the QR-code system has the ability to collect information about land users. A special website, [ilu-qr.uz](http://ilu-qr.uz), was created, and with the help of this platform, information about users of every land in the massif named Alisher Navoi, Guzor District, Kashkadarya Region was digitized and QR-code was given to them. This created QR-code allows you to present information in an interactive way. This kind of interactive service is recommended for all land users.

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## A Mobile Solution for Speech Content Memorizing

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**ABSTRACT:** The memorization is the process that allows human to acquire new knowledge and retain it in the long-term memory. Many techniques have been developed to optimize the human memorisation process. In this paper, we present a new method for memorising a speech audio content. Our method is based on segmenting and listening. The approach methods are implemented into a mobile application.

**KEYWORDS:** Humain Memorization, Digital Audio Processing, Supervised Learning, SVM.

### 1 INTRODUCTION

The purpose of this paper is to present our work relying on the two separate areas: memorization and Audio segmentation.

This paper is organized as follows: In the first section, we illustrate different learning and memorisation methods, and present our proposed method. The second section is dedicated to the automatic segmentation of audio signals; in this section we present our audio segmentation SVM algorithm. In the third section, we describe our mobile application solution for memorizing.

### 2 MEMORIZATION

The aim of memorization process, and learning in general, is to acquire knowledge and skills, and ensure long-term retention of all the learned information. As commonly used in the literature, the term *item*, in this paper, refers to the piece of information to be learned.

Through the human history, many memorization techniques have been developed such as: **Rote (or by heart) learning:** This method is based on passive repetition; it is seen as the opposite to meaningful and critical learning [25]. It has been used in Vedic chant since as long as three thousand years ago [29].

**Spaced repetition:** which exploits the psychological spacing effect (vs cramming), and it consists of committing information into long-term memory by means of increasing time intervals between subsequent reviews of the previously learned material [34].

**The lag effect** [23]: is the related observation that people learn even better if the spacing between practices gradually increases [19].

**Active recall:** a learning method that exploits the (testing effect) i.e. the fact that memorization is more efficient if the to-be-learned information is optimally selected through testing using proper learner feedback.

Optimal human learning techniques have been extensively studied by researchers in psychology, Pedagogy [13] [11] and computer science [32], [40], [39].

One of the first mathematical models for memorization is *the human forgetting curve* [14]. It defines the probability, over time, that a given learner will correctly recall a particular learned item. This probability is given by:

$$p = \left(\frac{1}{2}\right)^{\Delta T/h}$$

Where  $\Delta T$  refers to the lag time i.e. time elapsed since the last exposure to the item,  $h$  is the item Half-Life, it corresponds to the value of the lag  $\Delta T$  where the learner is likely on the verge of forgetting the item:  $p=0.5$ . A small value of  $\Delta T$  means that the item is fresh in learner memory, thus the probability of remembering it is high. The value of  $h$  is updated after each learner exposure to the item and based on temporal distribution of the item reviews.

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In Pimsleur model [27], the items are repeated at exponentially increasing intervals. And in Leitner System for flashcards [22]: The items are ranged in boxes, and each box has a reviewing periodicity. In this model, the new added items are assigned minimum periodicity. A number of spaced repetition software and online platforms have been developed to aid the learning process especially in language learning replacing the use of physical flashcards such as *Mnemosyne* [1], *Synap* [2], and *Duolingo* [3]. And in [34] the used model: MEMORIZE algorithm is based on stochastic differential equations with jumps.

The goal of an efficient memorization, for a learner, is to maximize the recall probability of all the items through calculation of the optimal reviewing time by determining which item would benefit the most from review.

*Our proposed models* We define the History of an item reviewing:  $H=(p_i, a_i)_i$  witch is the sequence of proposed periodicities  $p_i$  and user feedback  $a_i$ . The user feedback has two possible values: remember (action=1), and forget (action=0) indicating whether the user succeeded to remember the item in question. The History of an item deduced from a database event-log table, which contains the history of the user events relative to all items.

Obviously, the more complex the item, the harder it is to remember, and the model learns the item complexity through its reviewing history.

*Our first model* In our first model, we assume that the two last states of an item  $(p_{i-1}, a_{i-1})$  and  $(p_i, a_i)$  provide a concise summary of the whole reviewing history for that item. Unlike other models, our model does not take into consideration the total number of times where the learner reviewed item.

Giving the two last reviewing states, the new proposed periodicity  $p_{i+1}$  is calculated based on the precedent states  $(p_{i-1}, a_{i-1})$  and  $(p_i, a_i)$  as shown in the table below:

The four values in the table stem from the simple following idea: keeping increasing (resp decreasing) the periodicity while the two last user actions are

		$a_{i-1}$	
		1	0
$a_i$	1	$p_i \times 2$	$(p_{i-1} + p_i)/2$
	0	$(p_{i-1} + p_i)/2$	$p_i/2$

**Fig.1. the periodicity transition**

“Remember”(resp forget). If the user action changes, the new proposed periodicity is the mean of the two last periodicities using a Bisection approach [21].

Finally, we assume that all new added item have the same initial maximal difficulty inspired by Leitner System for flashcards [22]. This method of assigning difficulty to items is different for the one used by other online applications [3] where the default difficulty is deduced from other learners’ experience.

*Our second model* When exposed to an item, we calculate the probability  $p$  that the user will correctly remember the item, this probability is compared the actual action of the user. In addition, we define the probability error  $error\_prob=action \cdot p$  as the error in estimating the probability that the user will correctly recall the item. The error variable is then used to update the half-life of the reviewed item using this proposed formula:

$$HL \leftarrow \begin{cases} Max(\Delta T, (1 + error\_prob) \cdot HL) & \text{if } action = 1 \\ Min(\Delta T, (1 + error\_prob) \cdot HL) & \text{if } action = 0 \end{cases}$$

The next item to be reviewed in a time  $T$  is the one with the minimum probability that the learner remembers the item at time  $T$ , and adopting a stochastic -greedy approach [33].

### 3 SEGMENTATION

Automatic audio segmentation aims to divide a digital audio signal into segments [36], based on silence detection, content, or speaker identity.

One common automatic segmentation method consists on studying the amplitude envelop through detecting the peaks then connecting the successive ones linearly [31], or by interpolation [24]

In [37] the used idea is that the audio time-markers where the signal can be split correspond to sudden changes of values in most of features. A distancemetric between successive frames of the sound is used.

In this section, we will present our mono-channel audio segmentation method that is based on silence detection.

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Unlike classical approach where the rules are hard-coded, our approach uses a supervised method using a labeled training dataset. The training dataset contains labeled data that were constructed based on the exhaustive list of silencemarker times in a speech audio file. The time markers were manually established and correspond to elements of the time line silence where the file can be split or segmented. There are two main Python libraries that can be used to import and process digital audio signal: scipy-lib [4], Librosa [5]. In our work, we used Librosa library.

*Feature extraction* In order to manipulate (i.e. segment) the audio signal data, we start by extracting features. The utility of extracting feature from an audio signal is to reduce the huge sound data of a raw waveform to a smaller set of parameters. Generally, before extracting the features, the audio signal is preceded by a preprocessing phase, which consists of filtering frequencies. One of the most used filtering method is the Low-Pass Filtering (LPF): [9], [28], given, for example, that typical the human have a fundamental frequency from 85 to 255 Hz [8].

Depending upon which audio features are used, we distinguish two main approaches for the feature extraction: time-domain, and spectral (frequency) domain. In the first approach, the features are calculated using a sliding time windows using one of different methods such as Root Mean Square (RMS) [17]. True Amplitude Envelope (TAE) [10] or Zero Crossing Rate (ZCR) [16], [26].

The second approach uses a frequency analysis: Frequency-Domain Linear Prediction (FDLP), and recently Mel-Frequency Cepstral Coefficients (MFCC) [18] [30]. MFCCs are commonly used in combination with hidden Markov models [20], k-NN and SVM [6], or Convolutional Neural Networks (CNN) for audio classification [12] and speech [7]

Other sound features are used in the literature: pitch, loudness timbre and harmonicity. A comparison of 16 primary features belonging to the two approaches is presented in [38].

Our Feature extraction approach is based on RMS which is widely used in the literature as an estimation of the waveform amplitude envelop.

### Root-Mean Square (RMS) Energy

RMS is used to estimate the amplitude envelope (evolution over time of the amplitude of a sound) applying instantaneous root mean square value of the waveform through a sliding window  $w_i(t)$ :

$$RMS(t) = \sqrt{\frac{1}{T} \sum_{i=1}^T w_i(t) x_i^2(t)}$$

Where  $x_i(t)$  is the  $i^{th}$  sample of the signal centred around  $t$  as seen through the window  $w_i(t)$ ,  $t$  is the number of samples the analysis, and  $T$  is the window length.

For a simple rectangular window, we can use a simplified formula:

$$A = \sqrt{\sum_{n=1}^N x^2(n)}$$

In [15] a Speech/Music Discriminator based on RMS is used. If the RMS value in a frame is less than a pre-determined threshold, it is regarded as a silence frame. And in [41] an adaptive threshold is used that depends on the mean value of the absolute amplitudes of a signal.

Far from the RMS approach, our first used method consists on using MFCC and CNN. A key drawback to this approach is that it requires a larger amount of training data to operate; otherwise we have the overfitting problem.

The RMS output sample rate (we used the default value of 2205 per second). And the RMS method is used to generate data in our Machine Learning model as described below.

### Data structure

As we use a machine learning supervised algorithm, our dataset is composed of a predictive (input) data:  $X$ , and a target data:  $Y$ . An element of the  $X$  data is a sub-vector of the RMS vector with 12 dimensions, the first element contains the RMS value corresponding to a given time (element of time line). The  $Y$  data contains Boolean data; it indicates whether the time interval (time region) corresponding to the  $X$  entry does contain a silent.

### Constructing the training dataset

In this phase of feature engineering, we describe training data structure. The training dataset is composed of two subsets, the first corresponds to the times whose associated vector contains silence ( $Y_i=0$ ). And the second corresponds to elements relative to speech ( $Y_i=1$ ).

For a given labeled silence time in the audio file, we use the RMS vector relative to the entire audio file. From this vector, we extract the five 12-dimension sub-vectors that are nearest to the element corresponding to this silence time. Each of these five



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vectors is considered as containing a silence and thus is assigned the target value ( $Y=0$ ). The second subsets of the training dataset ( $Y=1$ ) is created using the same logic for an equidistance sample of time-points between two successive silence-times and sufficiently distant from these two silence-times.

Finally, we used he obtained training dataset to train a Support Vector Machine (SVM) supervised model.

*Extracting silence-markers* after our predictive model has been trained, it is used to extract silence-markers in an audio file in two steps. In the first step, we extract all 12- dimension sub-vectors of RMS-vector relative to an audio file that is recorded in similar conditions (volume, echo...) as those of the file on the training phase. The SVM binary classifier is applied to each of the sub-vectors. In a second step we calculate, for each element in the vector obtained in the first step, the number of previous elements of the vector considered by the SVM as silent (accumulation of continuous silence). Our classification algorithm predicts that the audio file can be segmented in a time-point if the number calculated in the second step is greater than an empirical threshold value of 10. Finally, we keep only the markers that are, at least, 1.5 seconds apart.

### Silence-marker times types

We used a two-tiered hierarchy of silence-markers in an audio-file: the first one corresponds to the beginning of a bloc (eg paragraph, chapter...), and the second corresponds to the beginning of a sub-bloc (eg sentence, verse in a poem...) of a bloc. The information relative to the marker type introduced based on human judgement, which depends on content structure of the audio file. The time interval of a sub-bloc is delimited by times between two successive markers.

Although giving good segmentation result for a pure speech audio files, the algorithm described in this section is not usable with files containing noise or mixed content (music, noisy environment...).

The resulting list of times corresponding to silence of the audio file is stored to an external file then to a database which is used later by our mobile application.

## 4 A MOBILE APPLICATION FOR AUDIO MEMORISATION AND REVISION

Exploiting the widespread access to smartphones, we describe in this section our offline memorization mobile application for Android devices. The application represents a tool for self-learning, that can help memorizing and reviewing the content of audio speech files. The application uses a method based on listening and reciting the audio sequences on an active and adaptive way, by taking into consideration the user capability, expressed as feedback, rather than being restricted to real time sequential listening. The audio files can be of different content: Lectures, poems, religious texts..

The items to be memorized correspond to sequences of the audio file defined using the segmentation algorithm. The idea of memorizing individually the sequences and not the entire audio file is inspired from the Chunking Memorising method [35]. The application version is an implementation of the second method in the memorisation section in an audio context.

### Database structure

The application uses a local database that comprises five tables:

*Tab File*: contains the paths and names of the audio files.

*Tab SubBloc*: indicates, for each marker, the corresponding time (in millisecond) in the corresponding audio file. The data in this table is the result of applying the algorithm in the section above.

*Item*: Contains all the audio sequences to be reviewed. Each of the sequences starts in a sub-bloc and finishes in another sub-bloc, and has an estimated half-life.

The user can customize a beginning and end times ( $T_b$ ,  $T_e$ ) if the times does not correspond to the beginning of a sub-bloc stemming from the segmentation depicted in the segmentation section. To do that we created two parameters that we named beginning percentage and end percentage. The new beginning and end times  $T_b$ ,  $T_e$  are calculated using the formulates:

$$T_b = S_b + (S_{b+1} - S_b) \cdot \frac{P_b}{100}$$

$$\text{and } T_e = S_{e-1} + (S_e - S_{e-1}) \cdot \frac{P_e}{100}$$

Fig.2. Calculating times based on percentages

The figure above depicts the new beginning and end times corresponding percentages:  $p_b=50$ , and  $p_e=25$ . Obviously, the beginning and end times have the default values:  $p_b=0$ ,  $p_e=100$ .

*tabLog*: contains the history of the user actions while revising the different items.

*tabParameter*: contains miscellaneous parameters of the application.

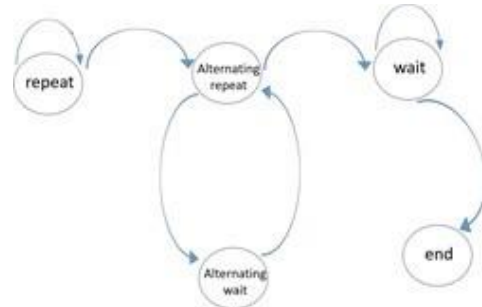
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### Memorization & Revision application interfaces

Besides general and auxiliary forms, the application interface contain two main forms, namely Memorization form and Revision form.

#### Memorization interface

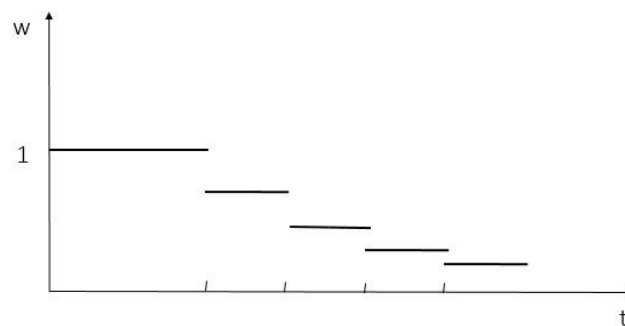
Memorizing form allows defining, and adding a new item i.e. sequence. Through this form, the user first chooses the audio file, and specify the beginning and the end of the passage. For both beginning and end passages, the user specifies the bloc number, the sub-bloc number, and the number of times that the sequence will be played. A short customised silence separate stopping and replaying the sequence. For the number of times of repeating we use three parameters that we call "repeating numbers". These repeating numbers define the initial state of the player whose evolving states follows the state graph automate:



**Fig.3. the player states transition**

*The First repeating number N1* indicates that the player, in a first step, simply plays the specified sequence N1 successive times.  
*The Second repeating number N2:*

Before defining the number N2, we first introduce the method decrease volume() that belongs to our created Player class. When invoked after playing a sequence, this function allows, after a delay, to decrease progressively the sound volume, using instance of the Java Timer class, after a specific duration, and when the volume is too low, the player is stopped. The charter bellow shows the look of the applied window.



**Fig.4. Window for decrease volume () method**

This method is applied in both states "wait" and "alternating wait" and it gives to the user the time to try to finish (recite) the started audio sequence.



**Fig.5. the wave form corresponding to a sequence**

The figure 1 shows the waveform corresponding to the recording, from the device speakerphone, of a sequence. And the figure 2 corresponds to the same sequence when decrease volume () method is called.

In a second step the player alternates simple playing (the state Alternating repeat) and playing with decrease volume (the state alternating wait) N2 times; that is why it is preferable to choose N2 as an even number.

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The third repeating number N3 indicates the number of times the sequence is played with application of the decrease volume() method( the state “wait”). Finally the system move to the “end” state.

Using the button “add”, the sequence with the user parameters defined above is added to a non-activated list. The elements of this list can be activated later through the menu “activation”. The activated sequences list is used by the re-



Fig.6. the wave form with decrease volume () method

Vision interface. When activated, an item is attributed a default haf life=30 seconds.

The button “Next” displays the sub-bloc whose beginning time corresponds to the current sequence end time.

### Revision interface

This interface is designed in a dark mode, and it uses swipe events, so it can be used even without looking at the device screen, or when the user is performing other activities; this also allows better accessibility for the visually impaired people. The interface displays a summary of current item, and has five user event listeners that can be triggered in any place in the screen:

1. **Right to Left swipe:** allows playing the current sequence with decrease volume. The user try then to complete the sequence. The played sequence is selected using the getNextItem() method detailed in the next paragraph.
2. **Left to Right swipe:** this event allows playing the current sequence, which is the same as the one played in event above, then the user compares the played sequence with his answer. Depending on whether, his answer is correct or not, the user initiate one of the two events bellow.
3. **Bottom to Top swipe:** The user initiates this event when he estimates that he memorized current sequence, so the periodicity of reappear in the future is reduced.
4. **Top to Bottom swipe:** In the opposite of the event above, this one is called when the sequence needs to be reinforced.
5. **Double tap:** allows to stop playing the sequence.

For performance reasons, if the audio file corresponding the current and precedent item is the same, the audio file is not reloaded since it is already present in the device memory.

The items used in this interface can be introduced either individually using the Revision interface, or automatically loaded in the database using a script variant that extract the times relative to successive overlapping sequences with a customizable minimum duration in an audio file with sequential content, as illustrated in the figure below:

The latter possibility is created essentially to relieve visually impaired people of using the Memorization interface.

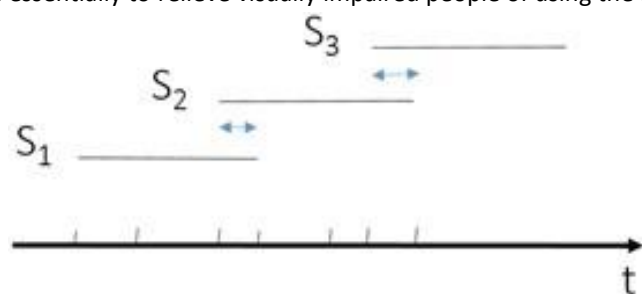


Fig.7. extracting the times relative to successive overlapping sequences

### Manipulating the items

The most two interesting method to manipulate item objects are getNextItem() and execute action() methods.

#### getNextItem()

The getNextItem() method returns the weakest item that currently requires more reinforcement. It is a static method(according to Object-oriented programming) of the class Item, and the returned item is the one with the minimum remembering probability . **execute \_action(action)**

When applied to an item object, the execute action() method updates the current item half life illustrated in the first section.

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### CONCLUSION

Through this paper, we have presented our audio memorisation approach. Some questions need more attention: In our solution as well as the other solutions, to the best of our knowledge, the learner feedback are restricted to only 2 choices “remember” and “forget”. So an other alternative can consist on introducing a scale value allowing to learner to indicate his degree easiness to remember the learned item.

Also our solution does not take into consideration the interrelation between the learned items where reviewing an item can increase, or decrease, the half-life relative to an other item.

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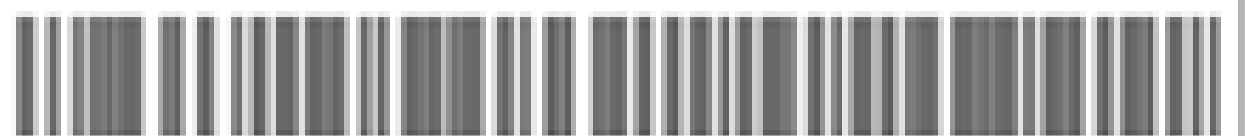
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