

## Teachers' Perceptions and Continuance Usage Intention of Artificial Intelligence Technology in Tesl



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**ABSTRACT:** Artificial Intelligence (AI) has paved the way for sustainable progress in all fields. In recent years, Artificial Intelligence in Education (AIEd) has shown a significant impact in the education sphere, especially after the outbreak of the Covid-19 pandemic hit the world. The various benefits and facilities of big data through educational technology have made AI a trend in the leading-edge education system. Teachers as one of the most essential stakeholders are responsible for implementing the curriculum and facilitating classroom learning. Despite the myriad advantages, AI technologies and applications are still underutilised in the teaching and learning process. Previous studies showed that a lot of AI-related studies in education are on AI system development in higher education, whereas AI technology use in primary education, particularly in ESL classes, receives inadequate attention. A survey-based study was conducted to examine the impact of teachers' perceptions on the continuance usage intention of AI technology in ESL primary schools. The research data were analysed using descriptive and inferential analysis to find the descriptive, correlation and regression results. Findings from the study revealed that teachers' perceptions influenced teachers' intention to continue using AI technology. Hence, in order to implement the policies, it is crucial for policymakers to take into consideration the responses of the teachers to transform working conditions and academic curricula effectively.

**KEYWORDS:** Artificial intelligence, Artificial Intelligence in Education, TESL, teachers' perceptions, primary school

### I. INTRODUCTION

The fast development of computing and data processing technology has accelerated the development and applications of artificial intelligence in many fields of life and study. Due to its capacity and its impact on innovation, artificial intelligence is employed extensively in a variety of fields due to its potential to propose solutions and improvements to a problem such as in enhancing medical practices (Ronzio et al., 2021, Guo et al., 2021; Aimiwu, 2022), managing business management and labour forces (Sabaityte, Davidaviciene, Karpoviciut, 2020; Kazim et.al., 2021) as well as advancing educational technology (Hafa & Moubtassime, 2021; Basar & Sahin, 2021). The integration of technology results in a significant number of innovations as well as changes in the social, cultural, and economic spheres (Basar & Sahin 2022). The application of technology will inevitably undergo a more complex and advanced development throughout the course of time.

English is widely used as a global language for communication. It has been recognised as the lingua franca of the 21st century for more than 30 years, making it absolutely necessary to acquire English language skills (Chehimi & Alameddine, 2022). AI can be used as a tool by teachers to facilitate the teaching and learning design or to support teachers' scaffolding strategies and to track students' learning progress and outcomes (Chounta et.al., 2021; Lindner & Romeiki 2019). The advancement of educational technology and digital platforms such as educational learning applications, Learning Management Systems (LMS) and virtual classrooms can be utilized to assist in the teaching and learning of a language more effectively. Information and Communication Technology (ICT) usage contributes to the transformation of the learning process towards a student-centered environment (Hafa, Moubtassim, 2021). Thus, to determine if teachers are ready to meet the demands of their students, it is crucial to look into teachers' opinions of using AI technology in their teaching practice.

It is crucial to recognize and comprehend the viewpoints, experiences, expectations, and long-term usage goals of the stakeholders while adopting AI technologies in order to sustain and make its use pedagogically meaningful. While numerous studies examine the use, impact, and goal of AI technology from the perspective of students (Khare et al., 2018; Dizon & Tang, 2020; Soria et al., 2021; Fahmi & Cahyono, 2021), studies on teachers' perspectives on the use of AI technology in primary education, especially in ESL context receives inadequate attention. Teachers' perceptions eventually are connected to various

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affecting variables that influence the use and the adoption of technology in their classrooms. Thus, this paper is conducted to study the perceptions of ESL primary school teachers and the continuous usage intention to use artificial intelligence technology in their teaching settings.

### II. LITERATURE REVIEW

#### A. Theoretical Literature

**Technology Continuance Theory:** Technology Continuance Theory is an integrated theory developed through the combination of Technology Acceptance Model, Expectation Confirmation Model and Cognitive Model for predicting long-term usage of technological innovations (Liao, et al. 2009). The Technology Continuance Theory is made up of six variables based on the variables tested on the three models: confirmation, satisfaction, perceived usefulness, perceived ease of use, attitude and information system continuance intention.

**Perceived Usefulness:** Perceived usefulness is described as a person's belief that a product or new technology will enhance the productivity of accomplishing a given task which indicates the efficiency of the user (Huang, 2021). If the users perceive technology as useful, the higher the technology acceptance is.

**Perceived Ease of Use:** Perceived ease of use is the extent to which an individual believes that a product or new technology is easy to be managed and utilised (Davis, 1986; Huang, 2021). When people believe that a technology is simpler to use, they will have a more favourable opinion to utilise the technology.

**Confirmation:** According to Daghan and Akkoyunlu (2016), confirmation is the users' intentions for continuing to use the information system. Lee (2009) in his study stated that the confirmation of expectations implies that users acquired the anticipated advantages from their technology usage experiences, which has a favourable effect on users' satisfaction.

**Satisfaction:** Satisfaction is defined as the feeling of disappointment when personal expectations and the emotion surrounding unmet expectations are compared to users' intentions with regard to their continued use of the information system. to how well a product or service performs in the eyes of the consumer (Oliver, 1981; Kotler, Jatusripiak & Maesincee, 1997; Tonta & Soydal, 2010). Satisfaction is highly influenced by confirmation.

**Information System Continuance Intention:** Intention is related to the tendency of an individual to act and the ability to predict a person's behaviour (Huang, 2021). On the other hand, continuance intention reflects the intention to continue using or reuse an information system which is influenced by users' satisfaction and perceived usefulness (Daghan & Akkoyunlu, 2016; Santhanamery & Ramayah, 2018; Huang 2021). Continuous usage intention is a crucial element for the system's success.

**Attitude:** Attitude toward use reflects attitudes regarding technological resources or instrument (Davis 1986; Liu, et al., 2009). Attitude and ways to use and adapt to the technology are developed by teachers' perceptions. Teachers' perceptions affect their attitude or behaviour when using technology which eventually leads to continuous usage intention of AI technology.

#### B. Empirical Literature

The advent of big data has enabled AI to evolve into a robust artificial neural network (UNESCO, 2020). According to Wang and Hu (2022), the enormous contribution that AI has made to the field of education is a direct outcome of the rapid development of machine learning and big data over the course of the previous two decades. AIED has had a significant effect on the current language learning trends. According to Hameed and Hashim (2022), the use of technology offers numerous advantages in the teaching and learning process and increases students' interest in learning. Learners will be able to explore outside limits, freely access materials, and choose their learning autonomy through adaptive learning. The educational experiences of individuals have been significantly impacted by technology in recent years (Jaiswal & Arun, 2021). This is due to AI's dynamic nature, its flexibility, and the benefits it offers to both students and teachers. It accommodates a wide range of students' needs and boosts global education institutions' ability to compete (Talan, 2021). Kent (2020) goes on to say that artificial intelligence technology is able to combine real-time content to the learning pace, needs, and preferences of the individual. Therefore, it is expected that teachers will equip themselves with technology literacy and abilities in information and communication technology (ICT) in order to accommodate students with better learning experiences and outcomes.

Mastering the English language has become a necessity in order to compete with the global market. It is considered as a second language globally and is essential for communication at the international level (Visaltanachoti, Viriyavejakulb & ThaninRatanaolarn, 2021). According to Abd Rahman et al., (2020), ESL learning is on the rise due to the extensive use of English in growing economic countries. Therefore, traditional curricula must be in line with technology-powered education as part of Education 4.0 with an emphasis on problem-solving, communication, critical thinking, teamwork, and abilities to think innovatively (Alakrash & Razak, 2021). This is because technology has a significant impact on every aspect of life and it has a massive impact on education which is vital in improving the economy of a country (Yunus et al., 2020; Loganathan & Hashim,

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2020). In order to cope with the current rigorous education demand, major initiatives need to be implemented to improve learning quality by leveraging ICT in classrooms by providing facilities such as projectors and computers and launching a digital learning platform. Thus, the teacher's role is crucial for the successful implementation of technology in English classes (Razak et al., 2018). The vast potential of AI technology can contribute to the success of language learners.

The usage of AI technology in language learning is evident through the booming of AI tools and applications used by students and teachers such as Quizizz, Kahoot, and Google Classroom. Studies show that technology is useful and beneficial for the teaching and learning of language skills and areas such as listening, speaking, reading, writing, vocabulary, grammar (Alsadoon, 2021; Bernardo et al., 2021; Akdamar, Seren, & Soner, 2021; Chee et al., 2021). According to Kopcha et al., (2020), using technology in teaching is one of the pivotal features of future learning since it can be utilized formally and informally. In ESL context, as English is the global language for communication, the usage of English among non-native speakers also increases. It is crucial for the teacher to design suitable educational experiences to achieve the learning objectives and learning outcomes by using technology in their teaching practice, especially when teaching ESL as they need to consider the various experiences that suit the learners (Pokrivcakova, 2019). The use of AI technology in ESL learning is even more important as it can be utilized as a teaching assistant or integrated during the educational process to enhance students' learning experiences, especially in ESL classrooms.

### C. The Present Study

This study explored the perceptions and the continuous usage intention of ESL teachers specifically in the state of Selangor primary schools on the use of AI technology in the teaching and learning of English. This study also reflected teachers' views and experiences when using AI technology to fulfill their teaching practice and student learning needs. The teachers' perceptions also reciprocated the attitude and eventually the continuous usage intention of utilising AI technology as part of their teaching and learning process. The findings should reflect the research question below:

**RQ1:** To what extent do teachers' perceptions influence the continuous usage intention of artificial intelligence technology in teaching and learning of ESL in primary schools?

The hypothesis in this study was developed by the researcher based on the research question:

**H1:** Teachers' perceptions influence the continuous usage intention of artificial intelligence technology.

## III. RESEARCH METHODOLOGY

### A. Research Design

A cross-sectional survey design is adopted for this study using a quantitative approach by distributing an online questionnaire via Google form. A cross-sectional survey is chosen because it collects data from a sample of the population or the whole population only at one point of time and a survey design enables data collection from a very large sample of population which suits the needs of this study (Showkat and Parveen, 2017). It enables the researcher to understand the situation of a particular group or community at present time based on the context of the study. This makes it fast and cost-effective to administer (Creswell, et al., 2019).

### B. Participants

This study employs convenience sampling. According to Etikan et al., (2015), convenience sampling is affordable, easy to be administered, and homogenous Participants are selected based on availability and willingness to take part (Wang & Cheng, 2020). The population of this study consists of primary school English teachers serving in the state of Selangor, Malaysia.

### C. Instrument

The questionnaire used in this study is adapted from reliable sources which have all shown reliability and validity evidence based on the studies conducted. The questions are modified based on the context of the study. The questionnaire comprises of 20 items. The Likert scale is used to examine how strongly subjects agree or disagree with statements on a five-point scale with the following range: (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly agree.

### D. Validity and Reliability Analysis

Validity is defined as the extent to which a concept and research instrument is consistent and accurately measured (Heale & Twycross, 2015). The draft of the questionnaire was sent to the experts to be evaluated for further suggestions and corrections. Amendments were then made based on their feedback and suggestions.

Reliability refers to the consistency of a measure over time and the stability on the instrument (Sürücü and Maslakçı, 2020). Cronbach Alpha was used to determine whether the item has weak or strong reliability. The range of 0.00 to 1.0 is used for to indicate the reliability level because it demonstrates internal consistency and the result is easy to analyse (Mat Nawi et al.,

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2019). According to Sürücü and Maslakçı (2020), 0.7 and above is regarded as an acceptable reliability score which shows high internal consistency.

**Table 1. The Results of Cronbach's Alpha Coefficient for research variables**

Variables	Cronbach's Alpha	Cronbach's Alpha based on the Standardized Items
Perceived Usefulness	0.949	0.953
Perceived Ease of Use	0.949	0.953
Computer Self-Efficacy	0.918	0.925
Satisfaction	0.926	0.926
Continuance Intention to Use	0.897	0.902

The result of Cronbach's Alpha showed that all of the items have the value of 0.8 and above. This shows that the items have high internal consistency which indicated that the questionnaire was reliable to be used as the source of data collection to gather the participants' perceptions and continuous usage intention for this study.

### E. Data Analysis

**Descriptive Analysis:** The data from the questionnaire were analysed using Statistical Package for the Social Sciences system (SPSS) to get the frequency metric, measures of central tendency and variance measures. and to determine the manner in which the data were distributed because it could alter the mean.

**Correlation Analysis:** Pearson correlation analysis was used to identify the relationship between all the variables in the study. This analysis is used to find out the strength of the relationship between independent and dependent variables whether the variables have a positive or negative relationship with the value ranging from -1 to +1 (Salkin, 2007; Md Yunus, Ang, Hashim, 2021). Large absolute values of correlation coefficients indicate greater levels of mutual covariance between the two variables (Huang, 2021).

**Regression Analysis:** In order to investigate the causal and effect between teachers' perceptions (independent variables) with continuous usage intention of AI technology (dependent variable), multiple regression was used to analyse the most significant relationship affecting the dependent variable using the p-values. The p-value greater and less than the degree of significance indicates a significant relationship and an insignificant relationship respectively.

## IV. RESULTS

### A. Descriptive Analysis

The data collected from the questionnaire were analysed to get each variable's means and standard deviations as shown in Table 2.

**Table 2. Descriptive Analysis for the Variables**

Variables	Mean	Standard Deviation
Perceived Usefulness	4.29	0.728
Perceived Ease of Use	3.98	0.874
Computer Self-Efficacy	4.02	0.879
Satisfaction	4.22	0.783
Continuance Intention to Use	4.15	0.778

The variables shown in Table 2 indicate the participants' perceptions of the items. Based on the results, perceived usefulness has the highest mean (M = 4.29) whereas perceived ease of use has the lowest mean (M= 3.98). Based on the mean score interpretation (EPRD, 2006; Chan, DeWitt & Chin, 2018), the variables were interpreted as having moderately high to very high

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reliability. All the variables have the standard deviation value range from 0.50 to 0.99 (Anthony, et al., 2018) which indicated moderate reliability. Hence, it can be deduced that the data is statistically significant and the overall results showed positive responses from the majority of the participants on the use of AI technology in ESL classrooms.

### B. Correlation Test

Pearson correlation was used in this study to identify the strength of the relationship between the dependent variable; information system continuance intention with the independent variables in this study which are perceived usefulness, perceived ease of use, computer self-efficacy and satisfaction. The relationship is defined as positive and negative relationship based on the range -1 to +1 (Salkin, 2007; Md Yunus, Ang, Hashim, 2021).

**Table 3. The results of correlation of factors**

	PU	PE	CP	ST	IN
PU	1.000				
PE	.887	1.000			
CP	.907	.922	1.000		
ST	.943	.919	.932	1.000	
IN	.959	.959	.969	.979	1.000

Note. IN = intention; PU = perceived usefulness; PE = perceived ease of use; CP = computer self-efficacy; ST = satisfaction, \*Correlation is significant at the 0.01 level.

The analysis of the factors was displayed in Table 3. The statistical link between two continuous variables was evaluated using Pearson correlation. It is recommended that factor loadings be higher than 0.40. (Salkin, 2007). The IN and ST component has the highest correlation of all the factors (0.979), which indicates a very strong positive relationship while the PU and PE factor has the lowest correlation (0.959). The correlation coefficients of each element are all greater than zero, indicating a positive relationship between the two variables. Overall, the correlation is in the range of 0.80 to 1.0, indicating that there is a very high positive association between all of the components. The result of  $p < 0.01$  indicates that each and every factor is significant. Therefore, provide evidence of convergent validity and reliability.

### C. Regression Test

Multiple regression was used in this study to predict the continuous usage intention of AI technology based on these independent variables, perceived usefulness, perceived ease of use, computer self-efficacy and satisfaction. The information system continuance intention was set as the constant or the dependent variable in this analysis. The data was normally distributed. The result from multiple regression analysis is tabulated as follows:

**Table 4. The results of multiple linear regression of the ESL teachers' perceptions on the continuous usage intention of AI technology**

Model	Coefficient	t-Value	Sig.
IN	.084	4.256	.000
PU	.225	16.867	.000
PE	.216	21.022	.000
CP	.232	20.650	.000
ST	.312	20.672	.000

Note. PU = perceived usefulness; PE = perceived ease of use; CP = computer self-efficacy; ST = satisfaction

\*Regression is significant at  $p < 0.05$ .

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**Table 5. The results of ANOVA in multiple regression**

Model	df	F	R <sup>2</sup>	Sig. *
Regression	4	15362.447	.995	.000 <sup>b</sup>
Residual	300			

A significant regression equation was found ( $F(4) = 15362.447$   $p < .000$ ), with an  $R^2$  of .995. The fitted regression model was;  $\text{Intention} = .084 + .312 (\text{SATISFACTION}) + .232 (\text{COMPUTER SELF-EFFICACY}) + .216 (\text{PERCEIVED EASE OF USE}) - .225 (\text{PERCEIVED OF USEFULNESS})$ . The overall regression was statistically significant ( $R^2 = .995$ ,  $F(4,300) = 15362.447$ ,  $p = <.000$ ). It was found that perceived of usefulness, perceived ease of use, computer self-efficacy and satisfaction significantly predicted AI technology continuous usage intention ( $\beta = .084$ ,  $p = <.000$ ). The p-value was below than the significant value .005 which indicated that it was statistically significant. Thus, it can be concluded that all the above variables impacted the ESL teachers' continuous usage intention to use technology.

The results confirm the hypothesis, and the summary is tabulated as follows (Table 6):

**Table 6. The established hypothesis**

Hypothesis	Condition
Hypothesis 1: Teachers' perceptions influence the continuous usage intention of artificial intelligence technology.	Valid

## V. DISCUSSION

The results showed that the teachers' perceptions or the independent variables in this study which are perceived usefulness, perceived ease of use, computer self-efficacy and satisfaction have a significant relationship with ESL primary teachers' continuous usage intention to use AI technology in their teaching and learning process. All the variables have very strong positive relationship and significant impact ( $\beta = .084$ ,  $p = <.000$ ) on the teachers' continuous usage intention of AI technology. Rusdin (2018) asserts that teachers' perceptions and comprehension of educational innovation have an impact on their choices, behaviours, and instructional strategies. Numerous credible research also demonstrates the beneficial effects of integrating AI tools, applications, and learning platforms into teaching and learning processes (Loganathan & Hashim, 2020; Ghoneim & Elghotmy, 2021). The use of AI technology in the classroom has the potential to assist teachers in facilitating students' learning and enhancing the efficacy of lesson plans.

Satisfaction component has the highest correlation of all the factors (0.979), which indicates a very strong positive association. In contrast to users' intents regarding their continuous usage of the information system, satisfaction is described as the sensation of disappointment when personal expectations and the emotion around unmet expectations are compared to how well a product or service performs in the perspective of the consumer (Oliver, 1981; Kotler, Jatusripiak & Maesiincee, 2000; Soydal, 2008). According to studies, perceived usefulness, computer self-efficacy, enjoyment, perceived behavioural, attitude, habit, and prior behaviour are the next strongest indicators of continued intention to use a system, followed by satisfaction (Lee, 2010; Dahan & Akkoyunlu, 2016; Wang, Lau & Leow, 2019). Previous research demonstrates that satisfaction affects the intention to continue using technology (Lin et al., 2005; Udo, Bagchi & Kirs, 2011; Lin, 2012; Bagci & Celik, 2018). These investigations came to the conclusion that the primary reason for the acceptance-discontinuance anomaly in system usage is satisfaction. It follows that satisfaction has an impact on a person's continuance usage intention to use new technology in the teaching and learning process.

Perceived ease of use has the lowest correlation which is 0.907. This is probably due to the external and internal barriers that are affecting the teachers' perceptions and their intention to continue using AI technology. The COVID-19 pandemic has affected the integration of AI technology in the classroom, where teachers are being compelled to adjust to teaching on digital platforms. Through a variety of AI tools and applications, teachers are using AI technology as an alternate method of teaching English as a Second Language (Kent, 2021; Alsadoon, 2021; Bernardo et al., 2021). However, the intricacy of AI technology or a system may hinder the desire to continue utilising it. The selection of AI technology is contingent on the teachers' capacity to manage it properly. If the users perceive technology as easy to use, the higher the technology acceptance. Personal variables such as a lack of digital literacy and abilities, nervousness, and interest can contribute to obstacles for

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teachers to utilise AI technology (Hameed & Hashim, 2022; Chiu & Chai, 2020). According to past studies, external factors, such as infrastructures, time, and students' lack of readiness, in addition to a poor internet connection, were also found to impact teachers' use of technology in the classroom (Boonmoh, Jumpakate & Karpklon, 2021; Kaumba et al., 2021).

### VI. CONCLUSION AND RECOMMENDATIONS

#### A. Conclusion

In conclusion, as a result of the rapid growth of technology, the traditional classroom structure is likely to give way to an environment driven by AI. The findings from this study confirmed that teachers' perceptions influenced their intention to continue using AI technology in their teaching practices. The incorporation and implementation of AI technology are unavoidable, and previous research indicates that it will have a substantial impact on the field of education over time. As English is a language that is used all over the world for communication, this has an effect on the methods that are used to teach English and English as a second language. Since teachers are the primary conduits via which students acquire new information in school settings, it is imperative that we take into account their perspectives on artificial intelligence and their plans to implement such technology. The AIED has demonstrated a significant capacity to adapt the teaching and learning processes in accordance with the twentieth century and the digital age in order to meet the educational requirements of today's students. This is in parallel with the the UNESCO's Technological Innovation in Education (2021-2025) blueprint, which aims to create equal opportunities for everyone to benefit from the technological revolution, particularly in innovation and knowledge, guided by the core principles of equity and inclusion.

#### B. Recommendations

This study was only conducted within the state of Selangor only. Longitudinal studies or long-term research can be conducted on a more diverse and bigger population. This is because of AI's dynamism, adaptability, and the benefits it provides to both students and teachers. Many aspects of life are significantly impacted by technology, which also offers new potential for advancement. Consequently, the constant evolution of technology has an effect on the educational sector as well. Thus, it is important to look into other populations and samplings as well.

In this study, the AI technology perceptions and intent to use technology were more focused on teacher-related concerns. It is vital to determine if the same constructs are also significant to students. This is due to the fact that student feedback and interaction with learning outcomes can aid in the improvement of teaching and learning techniques. Comparing teacher and student findings can increase the validity and reliability of the findings.

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