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Development of an E-Book-Based Flexibility Training Model for Karate

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ABSTRACT: Sports activities are considered very necessary to maintain body and physical condition amid the convenience offered by technology and science. Currently, one of the most popular sports in Indonesia is karate. However, the lack of sources of information and knowledge about karate training hinders the training process and possible preparation. Therefore, this study developed a very easy e-book-based flexibility training model, which can be applied practically to increase the training power of karate sports. The design of the research model for the development of a flexibility training e-book for karate sports will be carried out using the Borg and Gall development research model. In full, the steps of the Borg and Gall modification development model consist of the following ten steps: 1) preliminary research, 2) planning, 3) initial product development, 4) limited field test, 5) revision of limited field test results, 6) wider field test, 7) broader revision of field test results, 8) operational field test, 9) revision of operational field test results, and 10) dissemination and implementation of the final product. As a result, the effectiveness of using e-books in flexibility training at the Lemkari dojo showed relatively improved post-test results. The results of the pre-test and post-test flexibility through flexiometer tests in large-scale karateka trials in the "very good" category of 32.66%, the "good" category of 67.5%, the "Medium" category of 0%, the less category of 0% and the "ugly" category of 0%. Therefore, the flexibility training e-book for karate at Dojo Lemkari is declared very suitable to be used as a source of material and knowledge about flexibility training for karate sports.

KEYWORDS: flexibility karate, E-book, Sport

I. INTRODUCTION

The rapid development of the times tends to increase the desires and needs of every human being in order to remain productive. One of the fast-paced developments is the transformation of technology and science. Their development occurs simultaneously which can be a tool to facilitate daily activities. On the other hand, sports activities are considered very necessary to maintain body and physical condition amid the convenience offered by technology and science. Sport is a physical activity that contains games and contains struggles with oneself or struggles with others as well as confrontation with natural elements. In addition to maintaining health and physical fitness, sports can be used as an entertaining, fun activity and also an effort to achieve achievements. Currently, one of the most popular sports in Indonesia is martial arts. This is shown by the many types of martial arts spread throughout Indonesia, including karate. Karate martial arts is very loved by the people of Indonesia because it is the best sport that can be done anywhere, anytime, by anyone, no matter the special place, special equipment or the person desired as a partner. Karate martial arts is also growing in Indonesia with many competitions ranging from elementary, junior high, high school and high school as well as regional and national levels.

To achieve achievements in the field of karate, there are four shutter that need to be considered, namely physical, technical, strategic, and mental. A karate fighter needs complete physical condition in order to be able to get higher achievements in addition to mastery of technique, strategy and mental. Components of physical condition include strength, endurance, muscle explosive power or power, speed, coordination, flexibility, agility, balance, accuracy, and reaction. Putra, (2014: 1) stated that some of these physical conditions include body mass, readiness of muscle joints, and body adjustments to be ready to move actively. Suryana and Fitri (2017: 3), said that physical activity is a movement carried out by the muscles of the body and its supporting system. To achieve the readiness of the body in carrying out these movements, good and correct heating is needed according to the procedure. This aims to reduce the risk of injury.

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In martial sports, the physical aspect is one of the factors that determine the success of athletes. One of the main biomotor component aspects of karate is flexibility. According to Abdul Alim (2012: 1) Flexibility training is very important to support athletes' performance because flexibility is very influential on other biomotor components. Lack of flexibility is one of the main factors leading to unsatisfactory performance and inefficient technique, as well as the cause of many muscle strains and tears in sports that lead to sports injuries. Furthermore, inadequate flexibility is also the cause of not increasing speed and endurance limiters. With flexibility training, which is increasing the area of movement, it allows a person's speed and agility to improve, even the impact to the point of saving energy use. So athletes can work harder and longer. Unfortunately, there are still many trainers who do not understand the importance of flexibility exercises so that these exercises are rarely done and are not considered important. The cause of the lack of flexibility in karate training, novice athletes find the movements made difficult because they are not familiar with the movements and lack of flex exercises when warming up.

In some club's karate training is not even taught due to limited time, place, facilities and infrastructure as well as limited knowledge of teachers or trainers related to karate knowledge and also flexibility training models. Judging from the existing problems, so students and teachers and trainers need a flexibility training model that can later be used as a source of independent learning, training flexibility for students so as to make it easier to perform movements in karate so as to increase performance and can reduce the risk of injury when doing learning activities or exercises. With the availability of a flexibility training model that suits the needs of students, it is expected that learning and training will take place effectively and efficiently.

The lack of understanding and ability of coaches to be able to train the flexibility of their athletes properly and correctly so that the flexibility training model trained is only limited and monotonous and is one indication of the lack of quality of karate athletes. Because there are still a lack of sources of information and knowledge that explain about it. Actually, there have been many books that explain various ways to train flexibility in general, but there are still few books that explain how to train flexibility for karate martial arts. There are several sources of information and knowledge around practicing flexibility in general, but it can be difficult for the public to access.

Based on the above thinking, our researchers offer a promising solution, one of which is to increase the source of knowledge and information about flexibility training models for karate in the form of teaching products or exercises packaged in the form of E-books. The e-book-based approach method is considered necessary because it facilitates access for all users with the e-book content offered is relatively easy to understand and practice. This e-book can later be enjoyed and learned by all circles. This e-book comes with examples of flexibility training models for karate. Furthermore, the unu method uses easy-to-understand language that is interesting and easy to learn. Therefore, it is important to conduct research and development to create these products and be able to overcome existing problems.

II. MATERIAL AND METHODS

The type of research used is Research and Development (Research and Developmet), this research is oriented to the product being developed. In this development research, the product developed is an E-book-based Flexibility Training Model for Karate. This study is more focused on producing a learning resource for coaches and athletes in the form of an E-book entitled E-book-based Flexibility Training Model Guide for Karate Sports. The design of the research model for the development of a flexibility training e-book for karate sports will be carried out using the Borg and Gall development research model. In full, the steps of the Borg and Gall modification development model consist of the following ten steps: 1) preliminary research, 2) planning, 3) initial product development, 4) limited field test, 5) revision of limited field test results, 6) wider field test, 7) broader revision of field test results, 8) operational field test, 9) revision of operational field test results, and 10) dissemination and implementation of the final product.

Research Subjects, This development research, classifying test subjects into several parts such as (i) small group test subjects were carried out on 15 people consisting of 1 (one) coach and 14 (nine) athletes who participated in routine training at the Lemkari Karate Club private dojo and (ii) large field trial subjects were carried out on 25 people consisting of 3 (two) coaches and 22 (eighteen) athletes who participated in routine training at the Lemkari Dojo Kepahiang regency, Then 30 people from Dojo Lemkari Rejang Lebong. Data Collection Techniques In the data collection process carried out in this study, researchers used two techniques, namely preliminary study instruments and model development instruments and field trials. Data Analysis Techniques, Analysis of the data from the expert team's validation questionnaire using the following steps: (1) summing the scores obtained from each category, (2) determining the score categories as specified, and (3) entering the scores into the following formula:

$$P = \frac{F}{N} \times 100\ \%$$

Information:
P = Percentage score
F =Number of scores obtained
N =Maximum number of scores

III. RESULTS AND DISCUSSION

Small-scale trials were carried out at the Dojo lemkari kepahiang, for four weeks or sixteen meetings according to the training schedule at the Dojo. Based on the figure above, the results of small-scale trials obtained excellent results regarding the use of flexibility exercise E-books. This is evidenced by the percentage data of 89.33% being on the criteria of strongly agreeing, 10.67% being on the criteria of agreeing, while the criteria of enough, disagree and very disagree by 0%. In addition, an analysis of the effectiveness of the use of E-books on flexibility is also carried out. The results of the karateka flexibility exercise based on the increase in the average pre test and post test based on the assessment criteria obtained data as shown below.

Table 1. Pre test data results of small-scale flexiometer trials

Category	Range (cm)	Frequency	Percentage (%)
Very good	>24	0	0
Good	18-23	8	53,33333333
Keep	12-17	7	46,66666667
Less	6-11	0	0
Very less	1-5	0	0

Based on the above, it can be seen in the "very good" category by 0%, the "good" category by 0%, the "Medium" category by 92%, the less category by 8% and the "less once" category by 0%. Meanwhile, for the acquisition of post test data, namely:

Table 2. Post-test data results of small-scale flexiometer trials

Category	Range (cm)	Frequency	Percentage (%)
Very good	>24	7	46,66666667
Good	18-23	7	46,66666667
Keep	12-17	1	6,666666667
Less	6-11	0	0
Very less	1-5	0	0

Berdasarkan Tabel diatas, dapat dilihat pada kategori “baik sekali” sebesar 46%, kategori “baik” sebesar 47%, kategori “sedang” 7%, kategori kurang sebesar 0% dan kategori “kurang sekali” 0%. Dengan pemberian latihan fleksibilitas sesuai dengan komponen latihan yang dibutuhkan diperoleh data hasil post-test relatif lebih besar daripada data pre-test. The results of small-scale trials obtained excellent results regarding the use of flexibility exercise E-books. This is evidenced by the percentage data of 89.33% being on the criteria of strongly agreeing, 10.67% being on the criteria of agreeing, while the criteria of enough, disagree and very disagree by 0%. Then with the results of the pretest and post test on a small scale showed increased results from 16.9% to 22.13%, so that the effectiveness of the e-book can be continued to the next stage, namely large-scale or operational tests.

After small-scale trials or wider field trials at the lemkari dojo, then large-scale trials at two dojos, namely the lemkari kepahiang dojo and the rejang lebkari dojo. As for the data obtained from the following large-scale trials. that the results of large-scale trials also provide excellent implementation results and even increase from small-scale trial trials, with data acquisition 90.89% are in the category of strongly agree, 9.10% are in the category of agree, while the category of sufficient, disagree and very disagree by 0%. In addition, the effectiveness of the use of E-books on the flexibility of karateka who practice at the dojo is also reviewed in detail. The results of the karateka flexibility exercise based on the average increase in pre test and post test based on the assessment criteria were obtained.

Table 3. Increased average pre test and post test scores of karateka flexibility.

Sample	Pre tests	Post test	Average score increase
Club SK	16,93	22,13	6,8
Club 1 SB	18,2	23,86	5,66

Club 2 SB	13,48	22,48	9
Total	16,20	22,82	7,15
Information	Good	Good	Increased

Meanwhile, the level of flexibility of karate is also evidence of the effectiveness of using E-book flexibility exercises in this study with the acquisition of pre-test and post-test data shown in Table 4.

Table 4. Pre-test data results of large-scale flexiometer trials

Category	Range (cm)	Frequency	Percentage (%)
Very good	>24	0	0
Good	18-23	23	41,81818182
Keep	12-17	26	47,27272727
Less	6-11	6	10,90909091
Very less	1-5	0	0

With results seen in the "very good" category by 0%, the "good" category by 4%, the "medium" category by 47%, the less category by 11% and the "bad" category by 0%. Meanwhile, the acquisition of post-test data is summarized in Table 5.

Table 5. Post-test data results of large-scale flexiometer trials

Category	Range (cm)	Frequency	Percentage (%)
Very good	>24	19	34,55
Good	18-23	36	65,45
Keep	12-17	0	0,00
Less	6-11	0	0,00
Very less	1-5	0	0,00

The following results are seen in the "very good" category by 35%, the "good" category by 65%, the "medium" category by 0%, the less category by 0% and the "less once" category by 0%. The results of the karateka flexibility exercise based on the increase in the average pre test and post test Club 1 and 2 based on the assessment criteria obtained data as shown in Table 6.

Table 6. Increased average pre test and post test scores of karateka flexibility.

CLUB	Pretest (%)	Posttest (%)	Average score increase (%)
1	18,2	23,86	5,66
2	13,48	22,48	9
Information	15,84	23,17	**Increase**
	good	**good**	

The increase in the results of large-scale trials shows that E-book flexibility exercises for karate sports have a good effect on increasing the flexibility of karateka. The "medium" category has not increased from 47% to 0%, the "good" category from 42% to 65%, while for the "very good" category from 0% to 35%.

IV. CONCLUSION

Based on the results and discussion described above, the effectiveness of using e-books in flexibility training at the Lemkari dojo showed relatively improved post-test results. The results of the pre-test and post-test flexibility through flexiometer tests in large-scale karateka trials in the "very good" category of 32.66%, the "good" category of 67.5%, the "Medium" category of 0%, the less category of 0% and the "ugly" category of 0%. Therefore, the flexibility training e-book for karate at Dojo Lemkari is declared very suitable to be used as a source of material and knowledge regarding flexibility training.

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