

Development of a Physical Condition Test Application for Taekwondo Sports at PPLP North Sumatera

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Abstract. This research is on the development of a physical test assessment tool for taekwondo athletes based on the Android application to assist coaches and athletes in assessing the physical ability of taekwondo athletes. The subjects of the study were Taekwondo coaches and athletes. The implementation of the research was carried out at PPLP North Sumatera in Medan City, North Sumatera. Data collection starts from May 2024 – August 2024. The number of subjects in this study involved all North Sumatera PPLP taekwondo students and new students who chose Taekwondo in the implementation of the student interest and talent guidance test at North Sumatera PPLP. This research includes the direction of development research using the Borg and Gall development model. Based on the test results of the android-based physical test assessment tool on expert validation, it received a percentage of 82% with a good category. For small-scale product tests, a rate of 76% of the feasible category was obtained, and the analysis results of large-group product tests obtained 90% of the very feasible category. Based on the results of the above research data, it can be concluded that the taekwondo athlete physical test assessment tool product is suitable for use by users as a tool to measure the physical ability of athletes.

Keywords: Application, android, physical, taekwondo.

1 Introduction

The rapid development of technology has affected the pattern of human life. At least the presence of technology helps people's work become more efficient and effective, both as educators, sports coaches, and other professionals. Science and technology in major sports aspects are very influential in achieving athlete achievements. Along with the law, it can be understood how much technology plays a role in influencing the progress of sports, coaching, and management, as well as in the aspect of service. Along with the current development of science and technology; it is developing rapidly and under control. This can be seen in various innovations born from various layers of science. Therefore, it is necessary to use the right technology for users so that the technology used provides maximum benefits in sports. Indeed, in sports coaching, two elements affect the progress of sports achievements, namely due to

internal factors and external factors. External factors are factors that affect athletes from the outside, such factors such as technology, training materials, facilities, coaches, remuneration, and others Internal factors are factors that come from within the athlete, such as motivation, physical condition, discipline, commitment, etc. For both of the above factors, both must be considered equally in sports coaching, both by coaches and management. Taekwondo is one of the most popular sports today. The development of this sport has become a universal thing among ordinary people and modern society. The birth of competitors in urban and rural areas shows that this sport is popular among children and adults. Based on the research conducted by the researchers, the researchers found an obvious problem, namely the lack of practical equipment or protective equipment to help the physical assessment of taekwondo practitioners. Therefore, if there is no such application, the coach will have problems and take a long time to collect the physical symptoms of his athletes. The researcher chose the idea of providing a tool in the form of an Android application that allows physical testing and assessment of athletes' physical quality to be easier for coaches. The application in question is an Android training program that helps coaches test and evaluate the physical tests of taekwondo athletes. The role of the physical condition component in sports is undeniably very important, the physical condition component is the foundation of all sports. This physical condition consists of strength, endurance (Power), speed, flexibility, agility, coordination, balance, accuracy, and reaction.

2 Method

This research is categorized as R&D, which is research that uses the principles of the Research and Development method. Research and Development is a way of conducting research whose output aims to produce products from previous products and test aspects of the effectiveness of the product. The research was carried out at PPLP North Sumatra. The research was carried out in an estimated May 2024 – August 2024. The subjects that became the tryout in this clear study by going through the step/stage test phase I (small group) and the phase II test (large group) were aimed at coaches and athletes:

- 1) In the group/small group trial, it is recommended/recommended that this involves subjects as many as 15 athletes who are still actively practicing and one coach. In this small trial involving athletes who train at PPLP North Sumatra,
- 2) In the large group test in this study, the researcher involved 30 athletes from PPLP Taekwondo North Sumatra, the steps of this development research part are as follows:

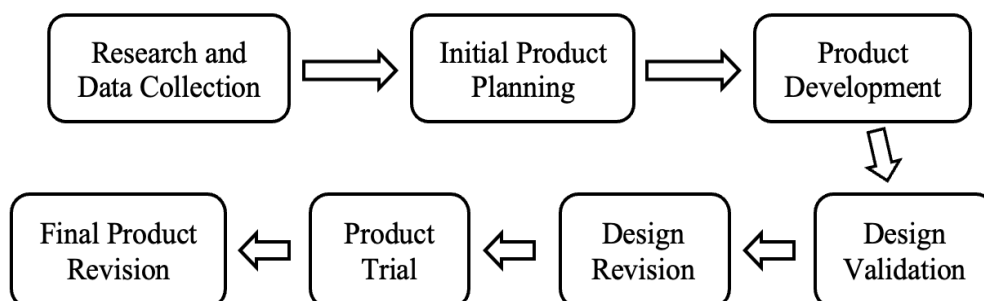


Fig. 1. Steps to use the Research and Development (R&D) method.

The research for this development uses analytical methods/techniques in descriptive quantitative types with percentages. Quantitative data is obtained through answers to questions and statements stated in the questionnaire, after the data is obtained then, an answer is converted into qualitative type data by giving score levels using the Likert scale and with a maximum scale response in assessing the feasibility of the product that has been developed for this study.

3 Result and Discussion

There is data on empirical studies in the field regarding the potential and problems found/in North Sumatra PPLP Taekwondo athletes, especially about the use of Android-based physical analysis application products in analyzing athletes' physical fitness. Then, the researcher tried to analyze the past needs and design a physical test assessment tool for Taekwondo athletes based on the android application in North Sumatra PPLP Taekwondo athletes. In the results of expert validation by combining the assessment data of the two experts, namely material experts and media experts, the average score on the assessment questionnaire of the physical test equipment for Taekwondo athletes based on the Android application was 82% with a very good category and conditional improvement from the validation of media experts. Therefore, it can be concluded that the results of expert validation on the assessment questionnaire of the physical test assessment tool for Taekwondo athletes based on the Android application are categorized as very good with the condition of improvement to be able to go to the small and large group product trial stage. The revision stage is important in this research because the criticism and suggestions given will be an important source in strengthening the product developed both functionally and in appearance. Thus, every expert in this study must provide a type of criticism and suggestion regarding the purpose of the finished product that has been developed, namely in the form of a set of athlete physical assessment applications for Android-based Taekwondo sports. To clarify the results of the expert validation assessment, the following is the form of the bar diagram. After conducting an expert validation trial, the researcher can continue to the next stage, namely a small group trial. The analysis of the small group trial was carried out neatly by determining and providing an assessment sheet in the form of a questionnaire to the respondents, namely 15 athletes and one coach, to provide an assessment of the application product that a serious android set-based physical assessment analysis of Taekwondo athletes has been developed. From the results obtained, the score of 194 categories is very decent, namely with a total suspension of 970, the score of 32 categories is feasible with a total score of 128, and the score of 206 categories is quite feasible with a total score of 618. The total number of scores obtained from respondents was 1716 (79.4%) with the category "Good" with suggestions to add to the physical test feature application. After completing the small group trial and product revision, the researcher can continue to the next stage, namely the large group trial, the large group trial is carried out by the small group respondents first and then the large group respondents, namely 30 athletes, so that the total large-scale respondents are 45 athletes that have been determined. The analysis of the large group trial was carried out by providing assessment sheets to respondents to assess the android-based physical assessment analysis application for athletes in Taekwondo sports that had been developed. The following are the results of the trial of large-group products.

The data collection technique carried out by the researcher is by using a questionnaire. The questionnaires used are a needs analysis questionnaire, a validation test questionnaire, and a product trial questionnaire. The questionnaire was used to collect the first data (needs analysis) aimed at Taekwondo coaches in North Sumatra. The questionnaire used to collect the second data is (validation test), which is addressed to 2 experts, namely material experts and media experts. The questionnaire was used to collect the third data, namely (small and large-scale product trials) aimed at athletes and coaches in PPLP North Sumatra. The Taekwondo coaches and athletes will discuss matters related to the development of physical assessment tools for Taekwondo athletes based on the Android application. The results of design validation tests, small-group field product tests, and large-group product field tests can be described in the following discussions:

The data obtained from the results of the design validation assessment of material and media experts showed an overall score percentage of 82% of the category was very good. The distribution of the results of each validation is as follows: The data obtained from the validation of material experts obtained a percentage of 91% of the category, which is very good, The data obtained from the validation of media experts obtained a percentage of 71% of the category is quite good with the condition of making improvements or adding profile features and summing using commas. The following is a table of recapitulation of the results of expert validation:

Table 1. Recapitulation of Expert Validation Results.

Test Levels	Percentage of Grades	Category
Expert Validation Test	82%	Excellent
Material Expert Validation Test	91%	Excellent
Media Expert Validation Test	76%	Pretty Good

At this stage, there were 15 athletes and 1 North Sumatra PPLP Taekwondo coach conducting a small group trial on the development of physical assessment media for Taekwondo athletes based on an Android application. After conducting the trial, the athlete was given an assessment and evaluation instrument to assess the application of physical analysis of the soccer athlete. The categories obtained in the small group trial by the sample are Good, and as for suggestions for the addition of test features. At this stage, there are 45 athletes from all North Sumatra PPLP Taekwondo athletes who conducted a large group trial on the development of physical analysis media for Taekwondo games based on an Android application. After conducting the trial, the athletes were given assessment and evaluation instruments to assess the application. The categories obtained in large group trials by the sample were excellent.

Table 2. Recapitulation of Respondents' Results.

Test Levels	Percentage of Grades	Category
Small Group Test	76%	Good
Large Group Test	90%	Excellent

4 Conclusion

Based on the results of the analysis of expert tests, field tests both small-scale and large-scale field tests, and the discussion of the results of the above research, it can be concluded that the development of an android application-based Taekwondo athlete physical test assessment tool on 45 athletes from PPLP North Sumatra is an innovation in the athletes who are the subjects of this study, where the application contains profiles, tests, and test records. From the results of the expert questionnaire on the design validation test, the small group of respondent trials and the large group of respondent trials stated that the development of this android-based application is suitable for use in the assessment of the physical test of Taekwondo athletes. Athletes of the North Sumatra PPLP Taekwondo sport are expected to always open this application regularly; this aims to remind them about the results of their physical tests that have been stored in the application, this aims to be a reminder for them to continue to practice seriously and with enthusiasm.

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