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Development of Volleyball Physical Condition Test Application for Collage Students

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Abstract

This research aims to develop a valid and practical application of physical condition test in volleyball. This research uses the Borg and Gall development model which consists of ten stages: potential and problem, data collection, product design, product validation, product revision, product trial, product revision, product use trial, product revision, and mass production. Data was collected using validation sheets and questionnaires. This physical condition test application has been validated by experts with a score of 4.20 which falls into the very valid category. This validation indicates that the application meets the standards required for use in physical condition testing of volleyball athletes. Product trials showed a practicality level of 3.40 in the excellent category, indicating that the app is easy to use. Trials of the use of the product showed practicality results of 3.79 in the excellent category, reinforcing the finding that this application is very useful in practice. The results of this study show that the developed physical condition test application can practically facilitate the collection and storage of physical condition test result data. The app is designed to assist users in collecting data more efficiently and accurately, as well as storing it securely for further analysis. With this application, the process of testing physical condition in volleyball becomes more efficient, reducing manual errors that may occur. Users are advised to use this application when conducting tests to get accurate results. The app not only helps in the testing process, but also ensures that the collected data can be easily accessed for evaluation and training. Thus, this application is expected to make a significant contribution in the field of sports, especially in improving the quality of training and performance of volleyball athletes. The use of technology in the field of sports is a step forward that can have a positive impact on the development and achievement of sports in the future.

How to Cite

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INTRODUCTION

Sports play a crucial role in maintaining both the physical and mental health of individuals and can serve as a means to enhance the quality of life. In this context, volleyball emerges as one of the sports that captures the attention of various groups, serving not only as a recreational activity but also as a competitive pursuit at different levels. It is essential to maintain physical fitness while engaging in volleyball, both to achieve optimal performance and to prevent injuries.

According to Rahmad et al., (2021), an individual's performance in sports greatly depends on their level of physical fitness. This viewpoint is supported by a similar opinion expressed by Prima & Kartiko (2021), asserting that physical fitness is a prerequisite for athletes to enhance and optimize sports performance. Therefore, physical fitness must be developed and improved in accordance with the characteristics and requirements of each sports discipline.

Sports volleyball, as one of the sporting disciplines that requires optimal physical fitness, demands players to maintain excellent bodily condition. According to Ahmadi (2007:65) cited in Amrullah et al., (2021), the physical fitness components that play a crucial role in volleyball include strength, endurance, explosive power of leg muscles, speed, flexibility, and agility.

In this digital era, technological advancements have significantly impacted various aspects of life, including the realm of sports. Technological applications have been utilized across various sports disciplines to monitor and enhance athletes' performance. The collaboration between sports, science, and technology continues to flourish. The use of more sophisticated devices represents a form of development based on previous studies (Triaiditya & Santoso, 2021). In the modern era, information technology has opened new opportunities for developing applications to monitor and assess physical conditions. However, there is still a need to create fitness assessment applications that can specifically evaluate aspects relevant to volleyball among students.

An application is a software unit deliberately created to fulfill various needs for different activities or tasks, such as business activities, advertising, public services, games, and various other human endeavors (Susanty et al., 2019). Fitness assessment applications can be employed to calculate the results of tests conducted according to relevant rules and norms. As stated by Kurniawan et al., (2023), the development of such applications would simplify the documentation of test results. The implementation of this technology can be an effective solution in supporting the evaluation and improvement of physical conditions, including volleyball players. Therefore, the innovative step of developing a fitness assessment application specifically for volleyball among students can have a positive impact on their performance and well-being.

Students play a crucial role in the development of sports in the university environment. As a dynamic and active group, students are often involved in various activities, including sports participation. Involving students in physical fitness tests can provide a deeper understanding of their physical condition, enabling the design of appropriate training programs to enhance sports performance, including volleyball. For students in physical education programs, physical fitness is an absolute requirement because they are more engaged in field activities and physical exercises compared to theoretical classes during lectures (Sinuraya & Barus, 2020) Therefore, physical fitness becomes an essential factor that must be possessed. Understanding their physical condition in more detail is important, especially for those interested or actively involved in volleyball.

In this article, we will delve into the steps involved in developing a physical fitness testing application for volleyball, incorporating crucial elements such as speed, strength, agility, and endurance within the context of this sport. With the existence of this application, it is expected that coaches, players, and stakeholders can gain a better understanding of the physical profiles of each volleyball student.

Furthermore, this article will also explore the concept of implementing this application as a tool to design more specific and personalized training programs for volleyball players. A deeper understanding of the physical condition of the students can aid in the development of training programs that are not only effective but also capable of enhancing their motivation and involvement in training sessions.

Considering the context, this scientific article will discuss the development of a physical fitness assessment application for the sport of volleyball among students. The purpose of developing this application is to provide a reliable and effective tool for measuring physical conditions directly related to volleyball performance. Through this application, it is expected to achieve a deeper understanding of the physical conditions of students involved in volleyball, enabling the formulation of more targeted and evidence-based training programs. Furthermore, this article will

also discuss the positive impact of implementing this physical fitness assessment application on the performance and well-being of students in the context of volleyball.

METHODS

Sports play a crucial role in maintaining both the physical and mental health of individuals and can serve as a means to enhance the quality of life. In this context, volleyball emerges as one of the sports that captures the attention of various groups, serving not only as a recreational activity but also as a competitive pursuit at different levels. It is essential to maintain physical fitness while engaging in volleyball, both to achieve optimal performance and to prevent injuries.

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Through this application, it is expected to achieve a deeper understanding of the physical conditions of students involved in volleyball, enabling the formulation of more targeted and evidence-based training programs. Furthermore, this article will also discuss the positive impact of implementing this physical fitness assessment application on the performance and well-being of students in the context of volleyball.

RESULTS AND DISCUSSION

Stage of Potential and Problems and Data Collection

In this stage, the researcher conducts an analysis of the needs of the students. The process begins with an examination of the reality of the implementation of physical fitness tests previously conducted by students. Therefore, the results of this stage will serve as the foundation for the development of a physical fitness assessment application for the sport of volleyball. The outcomes of this stage can be seen in the **Table 1.**

Table 1. Description of table

Category	N	%
Respondents have done physical condition tests	40	61,5
Record the results of physical condition tests on paper	40	61,5
The disadvantage of recording test results on paper makes a lot of garbage and takes up storage space.	33	50,7
The existing application has not been connected to the internet network, and can also only be accessed via Laptop / PC	23	35,3
Agree if the Application can be directly accessed via a smartphone / tablet device	60	92,3
Want to Use the Physical Condition Test Application to record and store physical test result data.	62	95,4

It was found that 61.5% of respondents have undergone physical fitness tests, and all of them manually recorded the test results on sheets of paper. About 50.7% of respondents mentioned that manual recording causes a lot of waste and requires more storage space. Therefore, it can be concluded that manual recording of physical fitness tests is not efficient. Although there are already applications for recording physical fitness test results, they are not connected to the internet and can only be accessed through a laptop/PC, in line with the responses from 35.3% of respondents. In this needs analysis, it was also found that 92.3% of respondents agree if the application can be accessed via a smartphone, and 95.4% of respondents want to use the physical fitness test application to record and store the results of the physical fitness tests they have conducted.

Initial Product Design Phase

The product design stage has produced a prototype of the physical fitness testing application for the sport of volleyball that aligns with the previous planning. The developed product can be accessed through the link https://app-kebugaran.site, where within the product, there are sections to store information related to the conducted physical fitness tests, including participant data, test results, and data for sports branches undergoing physical fitness tests

Figure 1. Initial Product Design Results

The follow-up to this stage is the validation stage. The results of the validation stage state that the product developed is valid with a value of 4.2 out of a maximum value of 5 which can be categorized as very valid and feasible based on the results of the 3 aspects tested by experts, namely the IT media aspect, the material aspect and the language aspect.

Table 2. Expert Validation Results

Validation	Assessment Results	Category
Material	5.00	Perfectly valid
Media IT	3.50	Valid
Language	4.20	Perfectly valid
Average value	4.20	Perfectly valid

Products that have been tested for validity are then revised according to the results and suggestions of validators. In this case, revisions were made to the IT media aspect, namely applications that were originally only accessible through laptops / PCs were improved so that they could be

accessed via smartphones or other gadgets.

Figure 2. Product Revision Results

Product Trial Phase

After the product has been declared valid and feasible, product trials are carried out on the developed product. This stage was carried out in a small group test with subjects totaling 25 people.

Table 3. Small Group Practicality Test Results

Aspects	Average
Highlights	3,21
Facilities	3,46
Helpfulness	3,54
Final Average	3,40

The findings of the results at this stage, the products developed can be accepted by users (students) who are assessed through a practicality questionnaire with a practicality value of 3.40 out of 4 where there are still 0.60 values that have not met the revision of the results. Revisions are made from the aspect of attractiveness and appearance of the application.

Figure 3. Small Group Practicality Test Product Revision Results

The test phase of product use was carried out in a large group with a total of 40 subjects. At this stage, practicality tests are still being carried out. Practicality tests are conducted through the same practicality questionnaire as the product trial questionnaire, which is aimed at seeing again whether the revised product can be accepted by users more than before.

Table 4. Large Group Practicality Test Results

Aspects	Average
Highlights	3,21
Facilities	3,46
Helpfulness	3,54
Final Average	3,40

Based on **Table 4** data, it is known that the entire average score of 3.79 which is included in the very positive category or in other words, the physical condition test application for volleyball that has been developed is considered practical and feasible to use. From the results of practicality tests in large group trials, there has been an increase, this can be seen in the graph below.

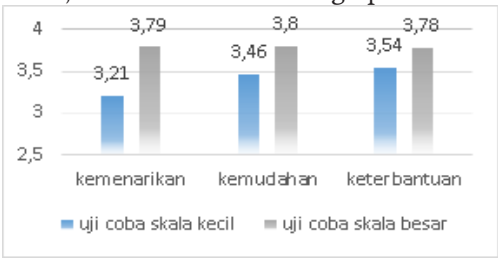

Figure 4. Practicality Value Improvement Graph

The graph above shows an increase in practicality test results on large-scale tests. This indicates that the product developed and considered sufficient does not require revision again. The increase is due to the increased attractiveness of use due to the appearance that is made more attractive, and the ease of operation of the application is quite easy and not complicated. The results of this study are supported by several studies that get the same results, namely Kresnapati et al., (2021), Gumantan et al., (2020), Irfan & Komaini, (2019) and Saputro et al., (2020).

The result of the development of this product is a valid and practical application of physical condition tests to record and store physical test results. This research was conducted at Sriwijaya University, precisely in the Physical Education study program with the research subjects of 65 students. This development research uses the Borg and Gall development model approach which consists of 10 steps, namely identifying

potential and problems, collecting data, designing products, conducting product validation, conducting product revisions, conducting product trials, conducting product revisions, conducting product usage trials, making final revisions, and mass producing products. The results of the student needs analysis stage found that problems about the Physical Condition test were still carried out using applications that could only be installed on one device and could not use the internet network (online). Even though the use of technology is very attached to everyday life. From the results of the needs analysis, this is what encourages researchers to carry out research on the development of physical condition test applications in accordance with the views of Baroya (2018) The development of the 21st century world is marked by the use of information and communication technology in all aspects of life. The initial product development stage produces prototypes of physical condition test applications that have been in accordance with previous planning. The developed product can be accessed through a https://app-kebugaran.site link where in the developed product there are 7 components of physical condition that can be used to calculate, record, and store data about physical condition tests. The next step of this phase is to test the validity of the product that has been made. There are two aspects tested, yaitu. media, 37 Universitas Sriwijaya materi dan bahasa. Dari The results of the validity test conducted by 2 experts got an average result of 4.2 with a very valid category. Products that have been declared valid are then carried out in the initial stage of testing with practicality tests in small groups with subjects totaling 25 students. The findings of the results at this stage, the products developed can be accepted by students who are assessed with a practicality questionnaire with a value of 3.40 out of 4 where there are still 0.60 that have not met and will be revised. The revisions made are on the design that is made more attractive than the initial design. After the revision, it continues with conducting main trials and operational trials. The next phase of the trial was carried out in a large group with a total of 40 students. At this stage, a practicality test is carried out through a practicality questionnaire. This stage of practicality testing is intended to see again whether the revised product has improved from before or not. The results of this practicality test with a value of 3.79 with a very good category. Then the research conducted (Setyawan et al., 2022) (Gumantan et al., 2020) (Irfan &; Komaini, 2019) (Saputro et al., 2020) strengthens the results that the use of physical condition test applications can improve the accuracy of physical condition test data and is safer for storage of physical condition test data.

CONCLUSION

Based on data and discussion of the results of research on the development of a physical condition test application for volleyball sports in students that the physical condition test application for volleyball sports in students developed was declared valid to be used with a rereta of 4.20 interpretations in the very valid category. The application of the physical condition test for volleyball sports in students developed was considered practical with an average of 4.67 interpretations in the very good category. From this description, it can be concluded that the application of the physical condition test for volleyball sports in students can be used for the purpose of collecting data on the physical condition of students, athletes and sportsmen technologically.

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