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DEVELOPMENT OF A DIGITAL UNDERHAND PASS TEST TOOL BASED ON AN ANDROID APPLICATION

Fatma Setya Handayani[1], Hartati[2], Samsul Azhar[3], Herri Yusfi[4], Wahyu Indra Bayu[5]
Universitas Sriwijaya[1,2,3,4,5]
fatmasetya423@gmail.com[1], hartati@fkip.unsri.ac.id[2], samsulazhar35@gmail.com[3], herriyusfi@fkip.unsri.ac.id[4], wahyu.indra@fkip.unsri.ac.id[5]

Abstract
This research aims to produce a digital lower passing test tool based on an Android application at SMP Negeri 55 Palembang. The type of research used is research and development (R&D), which is research that produces a product in the form of a digital lower passing test tool based on an Android application. The sampling technique in this research was all students in class VII of SMP Negeri 55 Palembang who at that time were studying bottom passing material in learning the game of volleyball. The data collection techniques used are product validity test data, practicality tests and effectiveness tests. The instruments in this research were validation sheets, questionnaires and students' passing tests. The data analysis technique is validity analysis, practicality analysis and effectiveness analysis. Based on the research results, it can be concluded from the research that the bottom passing test tool is said to be very valid, seen from the validator research results, namely an average percentage of 95% with a very valid category. Based on the student response questionnaire, this lower passing test tool is said to be practical to use with a score of 3.83 with a very positive classification. Based on the results of the bottom passing test, using this tool is effective for use in the learning process. The results of the lower passing test were obtained with an average of 16 in the high category. The conclusion of this research is that the Android application-based digital passing test tool is declared to be very valid in its use, this tool is also practical to use, and this tool is effectively used as a support for learning activities in the game of volleyball. The implementation of the results of this research is that the Android application-based digital passing test tool can be used as intended.

Keywords: *Test Tools; Underhand Pass; Digital; Android Apps.*

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Correspondence Author: Hartati, Universitas Sriwijaya, Indonesia.
E-Mail: hartati@fkip.unsri.ac.id

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INTRODUCTION

Volleyball is a popular sport in Indonesia and is widely played at various levels, including at junior high school level. Basic techniques in volleyball, such as down passes, play an important role in building a strong foundation of game

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skills. Underhand passing, also known as a “bump” or “forearm pass,” involves the skill of directing the ball with an outstretched forearm. These skills are important for starting a team's attack well and keeping the game running smoothly. When playing volleyball, there are several basic techniques that players must master, one of which is the basic passing technique (Raihanati & Wahyudi, 2021). Passing is a basic technique that must be mastered by volleyball players, therefore the technique that must be introduced to volleyball players is the passing technique, because passing is a form of play and is also an attack. Perina (2023) Passing is the act of passing the ball with two hands or arms by a player which is carried out from a field area.

From the results of observations on learning activities at State Junior High School 55 Palembang, students often lack knowledge about the correct technique in passing down with a lack of adequate practice or training which can also hinder the development of their skills in mastering this technique. Students who have not been able to perform lower passes and upper passes on volleyball optimally because these students are afraid of injuring their hands. So, when a volleyball passing skill test is carried out manually, maximum results are not obtained because it involves a number of problems, such as students working together to cheat in order to get good results, manual measurements are often more susceptible to subjectivity. Raters may have varying interpretations of how well the bottom passing technique is performed, which can produce inconsistent results. Manual measurements can have limitations in accuracy (Fauzi, 2018). Small differences in visual judgment can be difficult to measure accurately, especially when talking about subtle positions or angles. Manual measurements may only provide limited information about performance. Details such as ball speed, angle, or hand position may be difficult to measure precisely. Opinion Asmita & Fitriani (2022) the manual measurement process can be time consuming, especially if performed for a large number of students. This can affect efficiency in teaching and practice. However, in practice, teaching and assessing technical passing skills often faces several challenges. Teachers often face

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difficulty in providing consistent and accurate feedback to students on how to perform these techniques correctly. On the other hand, students have difficulty understanding instructions correctly and measuring their progress in mastering the technique (Zahwa & Syafi'i, 2022).

Lumbanraja (2022) With current technological advances, one of the shortcomings experienced in conducting tests and measurements of volleyball games is that the tools used are still manual. The volleyball passing test tool is one example. A test is a tool for collecting information in the form of tasks or questions that must be done by someone (Fenanlampir & Muhammad Muhyi, 2015). Using instruments that are still manual can certainly reduce effectiveness, efficiency, and the data produced is not objective. This situation could have occurred because the data obtained was manipulated because it was still manual. The development of a digital passing test tool based on an Android application aims to overcome several of these obstacles. By using smartphone technology commonly used by students, this test tool can provide a more interactive and visual learning experience. The application can be equipped with animation or video to explain more clearly how the bottom passing technique should be carried out.

The use of Android applications also allows for more accurate and objective measurements of student performance. Iyakrus (2021) Android OS was born as a child of the Android Inc. company. then acquired by Google LLC in 2005. In line with the opinion above John Wiley & Sons (2017: 2) explains that Android is a mobile operating system developed by a startup with the same name, namely Android, Inc. Sensors in smartphones can monitor movement and position, as well as provide instant feedback on how well the down pass technique was executed. Such measurement data can help teachers and students understand where improvements are needed and provide a stronger basis for measuring progress over time. The development of a digital passing test tool based on an Android application in this research has the potential to have a positive impact on volleyball learning at SMP Negeri 55 Palembang. It is hoped that this tool can

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integrate technology in the learning process, increase students' understanding of down-passing techniques, and provide a strong foundation for the development of students' skills in volleyball. From previous research conducted by Arif Hidayat (2022) with the title: Development of computer-based volleyball passing test and measurement devices. The research subjects were male and female volleyball athletes from Bina Darma University. From the results of this research, it can be concluded that the computer-based test and measurement tool for lower passing and upper passing in volleyball games is suitable for use as a volleyball passing test tool. Then research is carried out Astuti et al., (2022) entitled Development of interactive learning media for low and overhead passing techniques in volleyball based on android technology using MIT app inventor using the measurement technique used is observation or direct observation referring to the instrument for assessing basic volleyball underpassing techniques. After the assessment data on basic volleyball underpassing techniques was obtained, data analysis was carried out using quantitative techniques to measure the effectiveness of the Android application on the learning outcomes of volleyball underpassing for class X students.

Based on the description and problems above and guided by previous research, the author wants to develop a design model for a digital test tool based on an Android application that provides convenience and efficiency for teachers at the school. With this Android application-based digital test tool, it is hoped that teachers will no longer test volleyball passing skills manually. By using this digital test tool based on an Android application, teachers only need to see the score via the Android application and no longer need to calculate manually. So students cannot cheat on the score calculation in this volleyball passing test.

METHOD

This research uses RND (research and development) type research, namely a research method used to produce certain products, and test the effectiveness of these products, through analysis of needs in the field or the results of

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observations, interviews, questionnaires (Fransisca & Putri, 2019). This development generally aims to produce a digital volleyball passing test tool based on an Android application at SMP Negeri 55 Palembang. The subjects in this development research were 80 students at SMP Negeri 55 Palembang. The small-scale group test consisted of 20 students and the large group test consisted of 60 students. The data collection technique in this research is in the form of a questionnaire sheet for students and sports teachers. The questionnaire sheet was prepared with the aim of evaluating a digital volleyball underpassing ability test tool based on an Android application which has obtained validity by experts. The research instrument is a tool used to collect data regarding research, Sugiyono, (2019) Instruments are measuring tools in the form of questionnaires, tests, observation guidelines and interview guidelines used to collect research data. The questionnaires used in this research were media expert questionnaires, material experts, sports teacher questionnaires and student questionnaires. Data analysis carried out in this research uses quantitative analysis techniques which are assessments using numbers or percentage calculations. There are four eligibility categories after multiplying the percentages. In the next stage, the data calculation results are made in the form of a percentage multiplied by 100%. The following table is a table of eligibility categories.

Table 1. Percentage of Eligibility

Score in percentage	Eligibility Category
< 40 %	Not good/not worth it
40 % - 55 %	Not good / not worthy
56 % - 75 %	Good enough/decent enough
76 % - 100 %	Good / decent

(Source:Arif Hidayat, 2017)

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RESULT AND DISCUSSION

The results of the media validation assessment, a percentage of 96%, are in the very valid category and are suitable for use as a test tool for passing down in volleyball learning. The results of the application validation assessment of 95% are in the very valid category and suitable for use as a bottom passing test tool in learning the game of volleyball.

Tabel 2. Average Validator Rating Results

Validation	Rating result	Category
Media Validation	96%	Very Valid
Application Validation	95%	Very Valid
Average	95%	Very Valid

Judging from the table above, the average validator assessment of the Android application-based digital passing test tool that was developed was 95% in the very valid category. These results can be concluded that the Android application-based digital passing test tool can be used with slight revisions and can be tested.

The process of delivering the digital lower passing test tool product based on an Android application was carried out directly in the classroom at SMP Negeri 55 Palembang. All students in the sample attended the socialization or information regarding the test equipment. The presentation of this bottom passing test tool is carried out starting from how it is used. Then explain the benefits of this test tool and its drawbacks, namely that it can only be accessed with a stable or good enough internet network. Finally, there was a question and answer session regarding the down passing test tool.

To measure the effectiveness of the digital underpassing test tool based on an Android application created by researchers, an operational trial was carried out on class VII students who studied the volleyball game material on underpassing techniques, totaling 80 students. The researcher asked the sample to perform a

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bottom pass using a digital bottom passing test tool based on an Android application.

Effectiveness is measured by measuring the Android-based digital passing test tool on students. Achievement of lower passing results is the results carried out by the individual or student. The bottom pass is said to be successful if it reaches the specified accuracy. The following are the conditions for making a down pass. It can be concluded that the results for early stage trials and operational trials obtained values which can be seen in the following histogram.

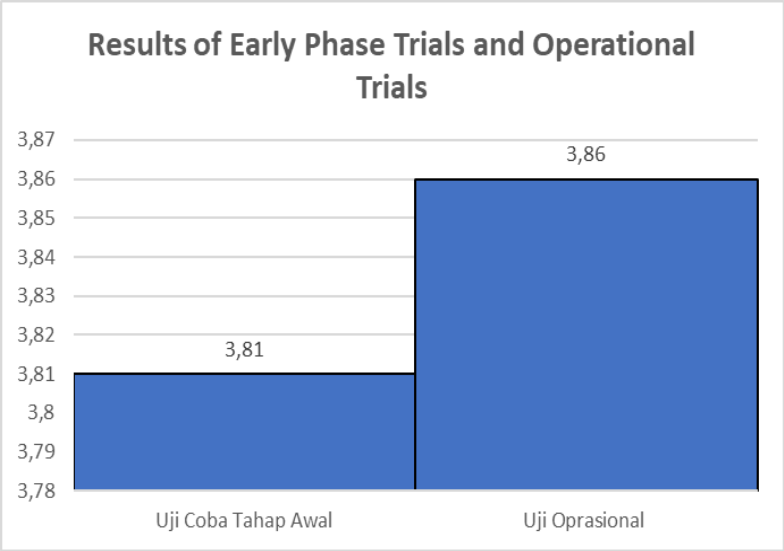

Figure 1. Results of Initial Phase Trials and Operational Trials

The results obtained in the underpass test using a digital underpass test tool based on an Android application are as follows.

Tabel 3. Bottom Passing Results Using Android Based Digital Underhand Pass Test Tool

NO	NAME	GENDER	AGE	TEST RESULTS
1	DAN	L	12	17
2	DP	L	12	17
3	DAN	L	12	16
4	FOZA	L	12	16
5	FS	L	12	17
6	GA	L	12	15
7	JF	L	12	16
8	KA	L	12	15

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9	MRR	L	12	16
10	MRR	L	12	17
11	MNA	L	12	16
12	NTN	L	12	16
13	RM	L	12	17
14	TRA	L	12	15
15	TW	L	12	15
16	WO	L	12	16
17	ARS	L	12	15
18	AE	L	12	17
19	DS	L	12	16
20	FS	L	12	16
21	GPI	L	12	16
22	MR	L	12	15
23	MRS	L	12	16
24	MT	L	13	15
25	MAF	L	12	16
26	RMF	L	12	15
27	MAS	L	12	17
28	RS	L	12	18
29	MR	L	12	17
30	RSAH	L	12	16
31	MARK	L	13	16
32	ATF	L	12	17
33	NAG	L	12	17
34	FP	L	12	17
35	GAM	L	12	18
36	KIC	L	12	18
37	KJ	L	12	17
38	LP	L	13	17
39	MAA	L	13	18
40	MRBA	L	13	17
41	MRY	L	13	17
42	MR	L	12	17
43	MVW	L	12	16
44	AHA	P	12	16
45	AT	P	12	17
46	AP	P	12	16

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47	AAD	P	12	16
48	CAA	P	12	16
49	ISR	P	12	17
50	MP	P	12	15
51	MP	P	12	16
52	MTP	P	12	17
53	MP	P	12	17
54	M	P	12	16
55	M	P	12	17
56	NP	P	12	16
57	PA	P	12	17
58	RM	P	12	16
59	SA	P	12	16
60	TYP	P	12	14
61	AN	P	12	17
62	AF	P	12	17
63	CQ	P	12	15
64	EP	P	12	16
65	F	P	12	16
66	INA	P	12	16
67	JP	P	12	17
68	LT	P	12	15
69	MP	P	12	16
70	ML	P	12	17
71	M	P	12	16
72	NNPP	P	12	18
73	ARJ	P	12	16
74	AJP	P	12	17
75	DA	P	12	17
76	EDR	P	12	17
77	FS	P	12	18
78	JA	P	12	17
79	KAAS	P	12	18
80	A	P	12	17
Mean				16

The table above shows the results of the lower passing test using a digital lower passing test tool based on the Android application, getting an average of

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lower passing, namely 16. The value of 16, namely in the table above, the lower passing assessment gets the 70th percentile category for ages 12-14 years. These results can be said that the bottom passing test tool is in the good category. These results can be concluded that the underpassing test tool developed can be categorized as an effective tool for measuring students' underpassing when learning the volleyball game underpassing technique.

The research results obtained were research into the development of an Android-based digital underpassing test tool which was declared suitable for use. From the results of the media and application validators, the results were 95% in the valid category. The initial and operational stage test results obtained an average result of 3.83. The results of the effectiveness test carried out by measuring students' underpassing using a digital underpassing test tool based on an Android application showed that an average of 16 was included in the high category. From the results, Physical Education, Sports and Health learning has a lot of material, either direct practice in the field or material that is only in class. Based on the curriculum, there are 10 chapters in PJOK learning. Physical education is education that involves physical activity aimed at gaining physical abilities or skills. Opinion Hartati et al., (2020) Physical education is an effort to improve human quality which is directed at building character and personality, discipline, sportsmanship, and can increase achievement which arouses a sense of nationality. For learning, there are various learning models, each of which has different goals and objectives (Mulyatiningsih, 2016).

This down passing test tool product is a learning medium for basic down passing techniques in volleyball for children aged 12-14 years based on an Android application. Students can run this lower passing application according to their wishes. This application of basic under passing techniques was designed and created to introduce basic under passing techniques so that students are not afraid to try these under passing techniques. The choice of the basic bottom passing technique was chosen based on direct observation in the field, and the results of discussions with my supervisor in the Physical Education and Health study

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program at Sriwijaya University. The media expert validation process produces data that can be used for initial product revisions. This media expert validation process uses validation as a basis for revising the product. After completing the revision, it is then validated again to perfect it until the product is ready to be used for testing. Then validate with application experts, from application experts obtain data, comments, suggestions and input to improve the quality of the application being created. The process of validating the researcher's application goes through two stages. The first is used as a basis for revising the initial product, after that it is revised and validated again so that the product is ready to be used and tested. The trial was carried out in two stages, namely small group trials and large group trials. So the results obtained are that this digital lower passing test tool based on an Android application is ready to be used to support teaching and learning activities.

Tools or what are usually called learning media include tools that can physically be used to convey learning material including books, tapes, cassettes, videos, films, slides, photos, images, computers, television and others. Media from an educational perspective is a very strategic instrument for determining the success of the teaching and learning process, because its presence can directly bring about changes in students. Iyakrus, Bayu, et al., (2022) Quality education can be achieved if the learning process is carried out smoothly, directed and in accordance with its objectives. The teaching and learning process will run effectively and efficiently if it is supported by the availability of media that supports the process. Technology has an impact on the social, emotional and physical aspects of the younger generation, which is important to pay attention to regarding the positive impact of digital technology in the current era (Higgins, Xiao, & Katsipataki, 2013). From the description above, this down passing test tool is very helpful in finding out students' abilities for down passing techniques when learning the game of volleyball. Like previous research conducted Dewi & Daulay (2020) The results obtained from expert validation in small group trials showed that it could be used, where the average percentage of validity was

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90.96%. The results of expert validation in large group trials can be used where the average percentage of validity is 95.33%. It can be concluded that this digital-based volleyball upper passing and lower passing ability test tool is feasible or can be used. Then from previous research conducted by Destriana et al., (2022) The results obtained show that there is a great need to develop an Android-based volleyball passing test application. The result was that 88% of respondents answered that the development of an Android-based volleyball passing test application needed to be developed. So the results of this product can be used for the bottom passing test so that it is easier, more practical, and more effective and efficient in the learning process in the field. So, in conclusion, this Android application-based digital passing test tool is suitable for use to facilitate teaching and learning activities in schools.

CONCLUSION

Based on the research and discussion described previously, several conclusions were obtained, namely that the research carried out was research into the development of a digital underpassing test tool based on an Android application as a measuring tool to determine students' underpassing in volleyball game lessons on underpassing techniques, for trial samples. The small group consisted of 20 students (N=20) and for the trial the large group consisted of 60 students (N=60) in class VII who studied volleyball at SMP Negeri 55 Palembang. This bottom passing test tool is said to be very valid seen from the validator assessment results, namely the average media and application validation score is 95% with a very valid classification. This bottom passing test tool is practical to use. The results of filling out the student response questionnaire were an average of 3.83 in the positive category. This Android application-based digital passing test tool is effective to use, because it gets an average passing test of 16, which is in the high category. Therefore, the digital lower passing test tool based on an Android application is valid, practical and affective for use in learning. Then, this underpassing test tool can help teachers find out the results of the

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underpasses made by students and vice versa, students will know the results of the underpasses they have made.

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