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Development of android-based self-assessment applications basic pencak silat techniques SMAN 1 Bengkalis

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Abstrack
The purpose is to determine the validity of the development of Android-based self-assessment applications in pencak silat learning and to know the reliability of the self-assessment applications developed. This type of research is development research (R & D) with the development model used, namely using the ADDIE model with the research subjects of SMAN 1 Bengkalis students by taking random sampling with the number of experimental group samples of 31 students and control group samples of 30 students. The data collection instrument uses expert validation questionnaires, documentation and tests of basic pencak silat techniques. Data analysis technique using rater aiken score analysis. The results of this study were filling out questionnaires by 3 martial arts experts obtained a value of 0.778 with a valid category, 3 measurement test experts obtained a value of 0.74 with a high category, 3 material curriculum experts obtained a value of 0.814 with a high category and 3 evaluation experts obtained a value of 0.74 with a high category. In the T test, the results of Tcount 26.54 > Ttable 2.00 were found where there was a difference between the experimental group and the control group. So it can be concluded that the android-based self-assessment application on the basic pencak silat technique is valid and can be used as an assessment medium used by teachers in assessing students.
Keywords: Self-assessment application; android-based; basic pencak silat techniques

INTRODUCTION

Pencak Silat is one of Indonesia's traditional cultural heritage and martial arts that has gone global (Sinulingga et al., 2022). As part of the educational curriculum in various schools in Indonesia, learning basic pencak silat techniques has an important role in the formation of character, discipline, and physical skills of students. However, in developing pencak silat learning, there are several challenges faced by teachers and students. One of these challenges is the lack of tools that can assist teachers in objectively assessing the progress of students in mastering basic pencak silat techniques (Alfarizi et al., 2020).

In the present times, technology has become an integral part of everyday life, including in the world of education. The development of Android-based application technology has opened up great opportunities to improve learning effectiveness, including in pencak silat learning (Riyadi et al., 2023). However, until now, there has been no application of self-assessment of basic pencak silat techniques that can assist teachers in providing assessments indirectly to students to assess themselves (Riani et al., 2021). Therefore, this study aims to develop an Android-based self-assessment application in learning basic pencak silat techniques at SMAN 1 Bengkalis.

In the context of education, it is important to utilize technology as a tool that can improve the quality of learning. Therefore, this research has significant relevance in supporting the development of learning basic pencak silat techniques in schools. Thus, this research is expected to make a positive contribution to efforts to improve the quality of pencak silat learning in Indonesia, while utilizing the potential of technology in education (Sampoerna et al., 2021).

This research presents innovation in learning methods by developing an Android-based self-assessment application that focuses on basic pencak silat techniques in the school environment. This

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is a major contribution that is very important in overcoming learning challenges in the digital era (Rohayati et al., 2022). The app gives learners the ability to independently assess their ability in martial arts, encourages autonomy in the learning process, and measures their progress effectively, creating more dynamic and adaptive learning methods (David et al., 2023).

Another important contribution is the significant improvement in assessment objectivity in pencak silat learning. In conventional learning, assessment is often influenced by subjective factors, such as teacher preference (Nugroho et al., 2022). With the application of self-assessment, evaluation becomes more objective and accurate. It helps teachers provide more precise feedback, motivates learners to improve their performance, and overall improves efficiency in pencak silat learning (Cahyono & Abdurrochim, 2022).

Pencak Silat as Part of Cultural Heritage and Sports (Ali & Tjahyadi, 2023), Pencak Silat is one of Indonesia's traditional martial arts that has high historical and cultural value. In addition, pencak silat has also been recognized as an international sport. In the education curriculum in Indonesia, pencak silat is an important subject for the formation of character and physical skills of students. However, there is a need for innovation in pencak silat learning and assessment methods to maintain its sustainability and relevance in the modern context (Warda et al., 2023).

The development of information and communication technology has changed the way of learning (Sidik et al., 2022). Android-based applications and computer software have been widely used in educational contexts, both at the school and university level (Humairoh et al., 2023; Sundari & Sukadiyanto, 2019; Wijaya, 2022). The use of this technology has opened up opportunities to improve the efficiency and effectiveness of learning, as well as provide a more interactive and engaging learning experience for learners.

Traditional assessment methods in pencak silat learning are often limited by the subjectivity of teachers. Assessment that is not objective can hinder the development of learners and reduce the accuracy in assessing their abilities (Aulia & Kurniawan, 2021). Therefore, the development of an Android-based self-assessment application for pencak silat learning is the right step to improve the objectivity and accuracy of assessment (Dwiatmini et al., 2023).

Several previous studies have examined the use of technology in martial arts learning, including pencak silat. However, the development of Android-based self-assessment applications specifically for basic martial arts techniques in schools is still a relatively new field and has not been explored much. Therefore, this research will be an important contribution in filling this knowledge gap and advancing pencak silat education in the digital age (Umar et al., 2022).

The use of the concept of self-assessment in the context of pencak silat learning has gained increasing attention in the world of education (Widiastuti et al., 2022). Self-assessment allows learners to actively measure their own abilities, gain a better understanding of their proficiency level, and identify areas for improvement. However, the specific application of self-assessment for basic martial arts techniques at the school level is still a very limited field in research. Therefore, this research was initiated to fill this gap and provide innovative solutions in utilizing the potential of technology in pencak silat learning.

In the context of modern education, it is important to continue to utilize technology as a tool that can improve the quality of learning. The application of Android-based self-assessment applications in learning basic pencak silat techniques at SMAN 1 Bengkalis will not only provide benefits for students and teachers in the school, but also can be a model for the development of traditional Indonesian martial arts learning in other schools. Thus, this research has great potential to make a positive contribution to pencak silat learning in Indonesia as well as utilize the potential of technology in education more broadly. The purpose of this study is to measure the validity and reliability of Android-based self-assessment applications in pencak silat learning, as well as to understand the impact of using these applications in assisting teachers in assessing students.

METHOD

The type of research is development research with the ADDIE model (Analysis, Design, Develop, Implementation, Evaluation). The product developed is the application of self-assessment Basic martial arts techniques. The data collection instrument uses expert validation questionnaires, documentation and tests of basic pencak silat techniques. Data analysis technique using rater aiken score analysis.

This research place was carried out at Sman 1 Bengkalis, The research instrument trial was carried out on class XII students located on Jl. Ahmad Yani Bengkalis City on July 31, 2023 to

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August 10, 2023. The time of the study was carried out in August 2023, and after the receipt of the proposal to conduct this research. Characteristics of Research Targets The characteristics of respondents are class XII students at SMAN 1 Bengkalis Kota who learn basic pencak silat techniques. For classes XII Science 3 and XII Science 4 at SMAN 1 Bengkalis Kota The total number of students consists of 61 students. The sample of this study amounted to 61 people, with a sampling technique that is random sampling.

The data collection instrument uses expert validation questionnaires, documentation and tests of basic pencak silat techniques. The data obtained were then analyzed using Aiken's rater score analysis and statistical tests to determine the difference between the experimental group and the control group. The conclusion of the study will be drawn based on the results of data analysis, with the decision that the Android-based self-assessment application is a valid and effective tool for student assessment in pencak silat learning at SMAN 1 Bengkalis. With this method, research becomes systematic and structured, ensuring application development is in accordance with the research objectives.

RESULTS AND DISCUSSION

Results

1. Model Development

The type of research conducted by researchers is development research with the ADDIE model (Analysis, Design, Develop, Implementation, Evaluation). The product developed is the application of self-assessment Basic martial arts techniques. Initial research activities are activities carried out for reference in the process of developing pencak silat self-assessment applications in pencak silat learning. This is related to activities that include collecting information that will be the basis for the development of self-assessment applications in fulfilling the assessment of basic pencak silat techniques for students. In other words, needs analysis is an integral part of designing a systematic self-assessment application. The preliminary analysis that the researcher conducts through observations consists of :

Goal analysis includes what goals you want to achieve, how to achieve those goals, when and why they want to be achieved. In the development of self-assessment applications, basic pencak silat techniques, which are taught in the learning process where students will be taught to be able to perform basic pencak silat movements properly and correctly by using the self-assessment application guide so that they can get higher scores. The development of self-assessment applications for basic pencak silat techniques can be used to achieve the learning objectives of pencak silat.

Based on the results of discussions with pencak silat experts, the self-assessment application can be used by teachers to assess students using the application. Therefore, the self-assessment application can help PJOK teachers in conducting indirect assessments of student achievements in conducting pencak silat learning. It is expected that students who use this application can do self-assessment by looking at the ability to move during the basic pencak silat technique.

The main purpose of developing self-assessment applications for basic pencak silat techniques in learning pencak silat is to produce a draft of self-assessment applications and can assist teachers in the process of assessing the movements of students. The results of the students' self-assessment can be seen by the teacher as shown below:

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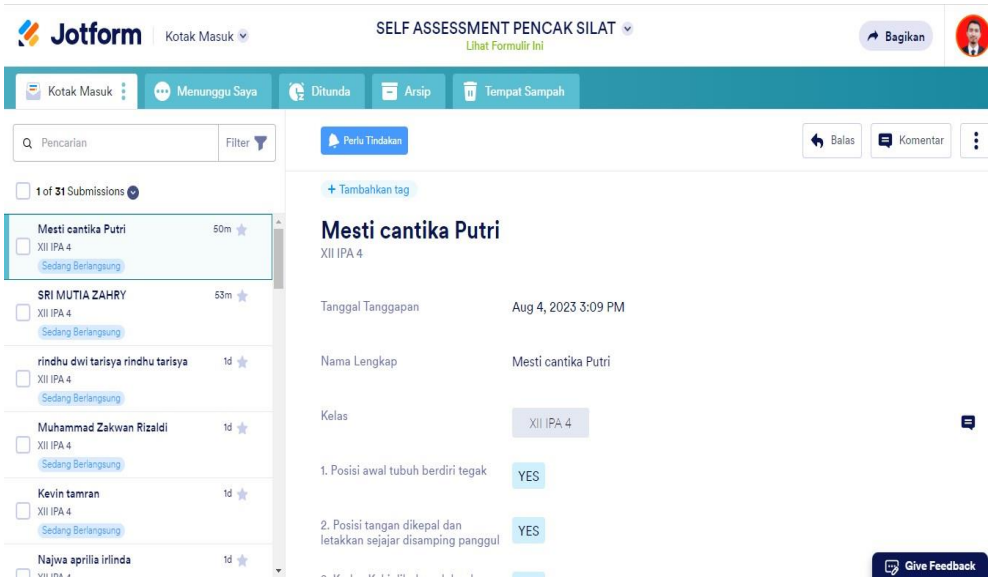

Figure 1. The results of self-assessment of students who will be assessed by the teacher

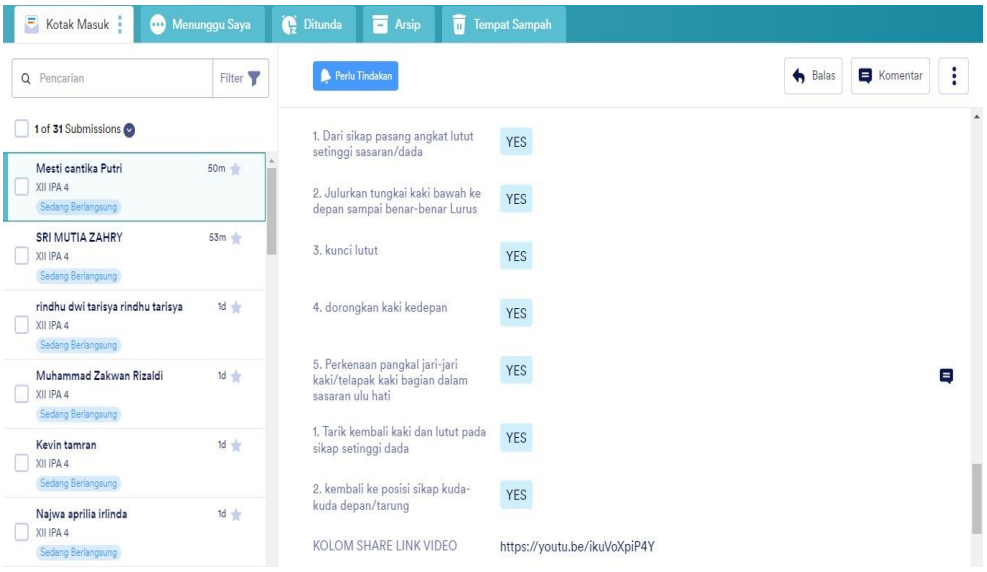

Figure 2. The results of self-assessment of students who will be assessed by the teacher

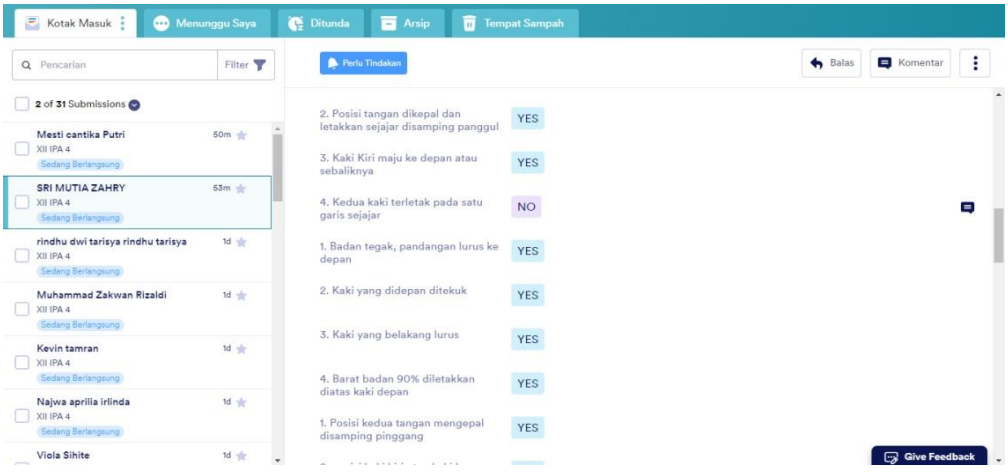

Figure 3. The results of self-assessment of students who will be assessed by the teacher

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After students use the pencak silat self-assessment application and fill out all self-assessments and upload videos of them doing pencak silat learning, PJOK teachers can monitor and conduct assessments by accessing the pencak silat self-assessment application. The PJOK teacher can see the results of the achievements of his students in learning basic pencak silat techniques, see from each indicator of the phase of implementing basic pencak silat techniques available in the application, and can also see videos of his students when doing the basic pencak silat techniques.

2. Model feasibility

At this stage, researchers conduct expert validation analysis with martial arts experts, measurement test experts, evaluation experts and material curriculum experts. Pencak silat namely Kamarudin S.pd, M.Pd, Jandika kusuma, and . Zulhendri Measurement test experts are Prof. Dr. Anton Komaini M.Pd, Dr. Zulrafli M.Pd, and Abu hurairah M.Si. Evaluation experts are Dr. Asep Sujana Wahyuri, S.Si, M.Pd, Merlina sari M.Pd, and M. Rusi Syawaludin M.Si. Material curriculum experts are Dr. Damrah, M.Pd, Riska saputra, S.Pd and Dr, Zulbahri, M.Pd.

Table 1. Validator Team

No	Validation	Validator Name
1	martial arts master	4. Kamarudin S.pd, M.Pd 5. Jandika kusuma 6. Zulhendri
2	Curriculum and Material Experts	4. Dr. Damrah, M.Pd 5. Riska saputra, S.Pd 6. Zulbahri, M.Pd
3	Test and Measurement Expert	4. Prof. Dr Anton Komaini M.pd 5. Dr. Zulrafli M.Pd 6. Abu hurairah M.Si
4	Evaluation Expert	4. Dr. Asep Sujana Wahyuri, S.Si, M.Pd 5. Merlina sari M.Pd 6. M.rusdi syawaludin M.Si

Based on the implementation of research on the development of the android-based Self Assessment Application basic techniques of pencak silat SMAN 1 Bengkalis, the following are the validation results of martial arts experts, measurement test experts, evaluation experts and material curriculum experts.

Table 2. Pencak Silat Expert Validation Results

Pencak Silat Expert Validator			**∑s**	**V**	**Criterion**
S1	**S2**	**S3**			
110	**96**	**95**	**301**	**0,7778**	**Hight**

Based on the results of expert validation of 3 martial arts experts, it can be concluded that the draft self-assessment application has very valid criteria. Validator 1 gets a total value of 110, validator 2 gets a total value of 96, validator 3 gets a total value of 95. So that the result of the validation value of martial arts experts is 0.778 with valid criteria.

Table 3. Measurement Test Expert Validation Results

Test Expert Validator			**∑s**	**V**	**Criterion**
	Measurement				
S1	**S2**	**S3**			
19	**23**	**18**	**Criterion**	**0,74**	**Hight**

Based on the results of expert validation of 3 measurement test experts, it can be concluded that the draft self-assessment application has high criteria. Validator 1 gets a total

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score of 19, validator 2 gets a value of 23 and validator 3 gets a value of 18. So that the result of the measurement test expert validation value is 0.74 with high criteria.

Table 4. Evaluation Expert Validation Results

Expert Validators Evaluation			**∑s**	**V**	**Criterion**
S1	**S2**	**S3**			
21	**33**	**32**		**0,74**	**Tinggi**

Based on the results of expert validation of 3 evaluation experts, it can be concluded that the draft self-assessment application has high criteria. Validator 1 gets a total value of 29, validator 2 gets a value of 21 and validator 3 gets a value of 32. So that the result of the evaluation expert validation value is 0.708 with high criteria.

Table 5. Results of Material Curriculum Expert Validation

Material Curriculum Expert Validator			**∑ s**	**V**	**Criterion**
S1	**S 2**	**S3**			
36	**47**	**49**		**0,8148**	**Tinggi**

Based on the results of expert validation of 3 material curriculum experts, it can be concluded that the draft self-assessment application has high criteria. Validator 1 gets a total score of 36, validator 2 gets a total score of 47 and validator 3 gets a total score of 49. So that the result of the material curriculum expert validation value is 0.814 with high criteria.

Products that have been validated, then reliability tests are carried out using the help of SPSS software. The following table displays reliability data on the design of Android-based self-assessment application development basic pencak silat techniques.

Table 6. Results Reliability of android-based self assessment application basic pencak silat techniques

Reliability Statistics

Cronbach's Alpha	N of Items
.752	43

Based on the results of the description in table 29, it shows that the results of expert assessment of the design of Android-based self-assessment application development are basic pencak silat techniques. with a reliability level of 0.752 which is on the reliable criteria. Thus, it can be said that the android-based self-assessment application of basic pencak silat techniques has been reliable and can be used in learning.

a) Generated Applications

1. Analysis

The assessment analysis stage begins with conducting a problem analysis, namely the need for self-assessment applications to facilitate PJOK teachers in assessing basic pencak silat techniques. then a target analysis was carried out, namely students at the equivalent high school / vocational level and PJOK teachers. This is reviewed by making direct observations to schools regarding the needs of PJOK teachers in the learning process. Furthermore, objective analysis and problem analysis are carried out by discussing with expert validators to develop a self-assessment application to facilitate students in learning and PJOK teachers in assessment.

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Therefore, a thought was created for an android-based self-assessment application, the basic techniques of pencak silat.

2.Design

The design stage is carried out to design an android-based self-assessment application for basic pencak silat techniques. At this stage, the selection and adjustment of the application concept is carried out which will be an attractive application. The self-assessment application is designed to facilitate teachers in assessment, especially in lessons on basic pencak silat techniques.

a. Application Design Development

The application design describes the overall relationship between the parts in the application, the application design is made to facilitate the subsequent process of creating the application and functions like a map on the application creation guide. The application has the following components:

a) Each learner has a personal account
b) Have a video learning basic pencak silat techniques.
c) Contains the stages of performing basic martial arts techniques.
d) Have a page to send learner videos
e) Sequential material starting from the initial stage, implementation stage and final stage.

3.Preparation of Application Eligibility Validation Instrument

In this stage, this design is also prepared an application feasibility validation instrument which is a product developed by researchers. As for this study, validation is in the form of a checklist questionnaire for martial arts experts, test and measurement experts, evaluation experts and material curriculum experts. The result of this stage is an assessment of the aspects of the stages of basic pencak silat techniques, aspects of tests and measurements, aspects of evaluation and aspects of the material curriculum on the quality of the quality in the android-based self-assessment application of basic pencak silat techniques.

As for expert validators with martial arts experts, measurement test experts, evaluation experts and material curriculum experts. Pencak silat namely Kamarudin S.pd, M.Pd, Jandika kusuma, and . Zulhendri Measurement test experts are Prof. Dr. Anton Komaini M.Pd, Dr. Zulrafli M.Pd, and Abu hurairah M.Si. Evaluation experts are Dr. Asep Sujana Wahyuri, S.Si, M.Pd, Merlina sari M.Pd, and M. Rusi Syawaludin M.Si. Material curriculum experts are Dr. Damrah, M.Pd, Riska saputra, S.Pd and Dr, Zulbahri, M.Pd

4. Development

This stage is the product realization stage, namely making an android-based self-assessment application, the basic techniques of pencak silat in learning pencak silat include material content, validation and production. The content of the android-based self-assessment application of basic pencak silat techniques in learning pencak silat is the subject of basic pencak silat techniques. The self-assessment application uses jotform, the beginning of the application contains the names of students and the class of students. On the next page in the form of learning videos of basic pencak silat techniques and self-assessment of students. The next page is the video upload page of students when doing basic martial arts techniques. The last page is the Submit Assessment page and the video is successful.

This development stage is carried out when making a self assessment application, below are some stages of making an android-based self assessment application Basic Pencak Silat Techniques:

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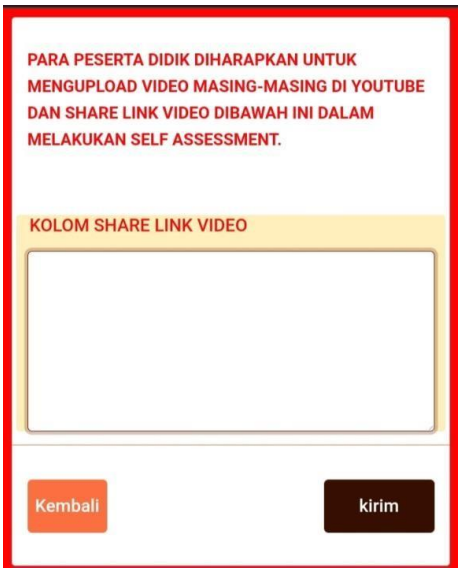
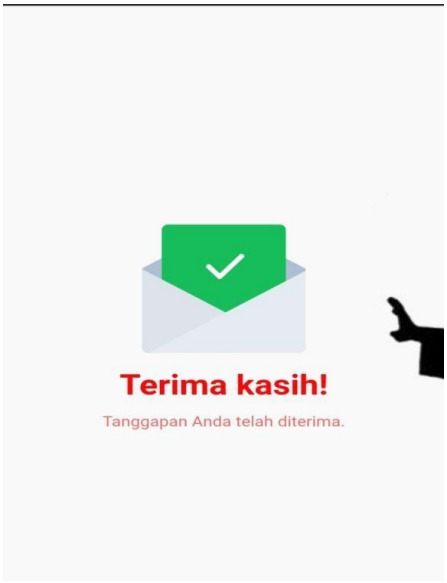
Figure 4. Pencak Silat Self Assessment Application Start Page





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5. Implementation

This stage is a product trial. Self-assessment applications that have been developed in addition to applications with the subject matter of basic pencak silat techniques. Product implementation is carried out from November 15 – December 15, 2022 at SMAN 1 Bengkalis. The trial of this product was carried out by researchers in 1 stage.

The results of the first phase of the self-assessment application trial were obtained from the results of using the self-assessment application. In the first phase of the application trial, 31 students of grade XII Science 4 were tested. Data on application trials is obtained from the use of self-assessment applications used. The following table is the results of student trials using self-assessment applications.

Table 7. Comparison Results of the Experimental Group and the Control Group

Uji F	**Mean**	**Varians**	**Fh**	**Ft**	**Information**
Experimental Group	95,87	29,82	0,611	0,54	**Homogeneous**
Control Group	53,18	48,76			
Uji T	**Mean**	**Varians**	**Th**	**Tt**	**Information**
Experimental Group	95,87	29,82	26,54	2,00	There Are Significant Differences
Control Group	53,18	48,76			

From the results of the trial using the android-based self-assessment application, the basic pencak silat techniques of SMAN1 Bengkalis students obtained results from the experimental group and the control group with a Tcount of 26.54 > Ttable 2.00, it can be concluded that there is a difference between the experimental group and the control group. So it can be seen that the use of self-assessment applications has differences between experimental groups that use android-based self-assessment applications, basic pencak silat techniques, and control groups that do not use android-based self-assessment applications, basic pencak silat techniques.

6.Evaluation

In this study, only formative evaluation is needed during product trials, because this type of research is related to the development research stage carried out by researchers, namely to develop Android-based self-assessment applications, basic pencak silat techniques in pencak silat learning in the form of drafts and applications. The content of this evaluation is a summary of the use of self-assessment applications contained in the previous learning process without using self-assessment applications.

3.Model Effectiveness

The effectiveness of the self-assessment application developed can be seen from the results of the ability test of basic martial arts techniques. The results of the analysis on the effectiveness test with experiments (T test with a significant level $\alpha = 0.05$) on the Android-based self-assessment application of basic pencak silat techniques show that the application is effective in improving the ability of basic pencak silat techniques. This is seen from the difference between the results of the basic pencak silat technique experimental class and the control class. Where the experimental class is a class that uses an android-based self-assessment application, basic pencak silat techniques, and the control class does not use an android-based self-assessment application, basic pencak silat techniques. Where the android-based self-assessment application of basic pencak silat techniques has a greater influence on the ability of basic pencak silat techniques.

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Table 8. Effectiveness Test

Group	Number of Samples	The Total Value of Basic Pencak Silat Techniques	Average Score	Category
Kelas Eksperimen	31	1278	41,23	Effective
Kelas Kontrol	30	686	22,87	Less Effective

Discussion

Haqiyah, (2022), Pencak silat is an original Indonesian martial art that has been for centuries. Pencak silat is also passed down from one generation to the next which in the past when humans were still alive from hunting, they lived in groups and hostilely to maintain their lives, one of the kick techniques in pencak silat is the sickle kick. Through pencak silat sports, it is hoped that it will increase physical freshness, health, increase discipline character and to increase students' confidence and be more courageous to do sports regularly.

Gandasari et al., (2023) "Pencak silat is a martial arts cultural heritage of the ancestors of the Indonesian nation to maintain their lives, humans always defend themselves from threats from nature, animals, and others who are considered to threaten their integrity". Anas & Adi, (2018) Pencak is a movement of attack bela movements in the form of dance and rhythm with certain rules of politeness that can be performed in public. Silat is the essence of pencak, the science of fighting or defending yourself desperately that cannot be performed in public (Mukhtarsyaf et al., 2022; Mylsidayu & Mamesah, 2022).

Based on the description above, it can be explained that pencak silat sports in learning physical education sports and health (PJOK) is very important expected students to master techniques in sports in PJOK learning, one of which is pencak silat martial arts skills, to be skilled in pencak sillat, students must first master the basic techniques in pencak silat properly and correctly, The basic technical skills that are dominant in pencak silat are T-kick, straight kick, sickle kick, and punch techniques. According to lubis, johansyah (BB 2004) In Loviana Carolin (2020) said that pencak silat there are seven basic techniques, namely: step patterns, attacks, stances, catches, tide attitudes, avoidance, and defense.

Based on the observations of researchers in schools related to the implementation of basic techniques in pencak silat, many students experience problems in doing so, especially basic pencak silat techniques, basically basic techniques are the key to success in learning pencak silat, this is because students do not know the basic techniques in the form of kicks, punches, and stance, both from the initial phase of the core and the final phase, Basic techniques in pencak silat are the most important thing to usually master the next technique, basic techniques function to maintain body balance, both in an attacking and defensive position (Saputro et al., 2021).

One of the reasons is the difficulty of teachers in assessing, improving and supervising students in basic pencak silat technique skills is because in 1 class there are 25 to 30 students, this is the main problem in the development of movement skills in basic techniques for students And even if it must be forced to assess, improve and supervise that many students in a way one by one, It will be very difficult, while in the theory of motion, if there is an error in motion must be corrected immediately so that permanent motor deviations do not occur. One way to improve this is by the way teachers conduct assessments indirectly, namely by applying self-assessment (self-assessment) to their students. This is in accordance with the regulation of the Minister of Education and Culture of the Republic of Indonesia no.66 of 2013 concerning educational assessment standards, it is explained that one of the assessment techniques is self-assessment.

Efforts are made to improve the ability of students to be able to perform basic pencak silat techniques so as to get good grades, namely providing learning in accordance with the targets of basic pencak silat techniques to be achieved (Malasari & Yulisatria, 2023). One way is to provide an android-based self-assessment application for basic pencak silat techniques in learning pencak

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silat in order to create perfect basic techniques. The self-assessment application is an application that helps teachers assess the movements made by students (Kurniawan et al., 2023).

This study aims to assist PJOK teachers in assessing the movements of students, especially the movement of basic pencak silat techniques. Through the developed self-assessment application, students are expected to explore, find and utilize objects that are easy to find so that learning objectives will be achieved. Rusman in (Lauh et al., 2020) in learning process activities determining the learning model to be used must consider several things, such as learning objectives, learning materials, didk participants and other considerations that are non-technical (Ihsan et al., 2022).

In this study, the development of an android-based self-assessment application for basic pencak silat techniques in learning pencak silat class XII Science 4 SMAN 1 Bengkalis. Researchers use the ADDIE development model which consists of 5 stages, namely: analysis, design, development, implementation, and evaluation. Development research begins with direct observation to the school, namely by making observations during the learning process at SMAN 1 Bengkalis. It was conducted on July 31, 2023 and found data that SMAN 1 Bengkalis in the learning process, especially the assessment pencak silat material, did not use an assessment application, only using assessments from the perspective of PJOK teachers.

After getting an overview of the learning process of PJOK subjects at SMAN 1 Bengkalis, the researcher continued his research step, namely designing an android-based self-assessment application for basic pencak silat techniques in draft form. Researchers chose the basic technique material of pencak silat as the main ingredient in the application. In terms of media, researchers used a platform called "Jotform" and developed it into a self-assessment application.

In order to know whether or not the development product is feasible, the researcher takes the next step of this development, namely making an expert validation instrument which is a questionnaire checklist. This validation includes aspects of basic pencak silat techniques, aspects of tests and measurements, aspects of evaluation and aspects of material curriculum. The results of validation of the draft application made by the researcher are known to be suitable for use or application to students of SMAN 1 Bengkalis Kota who were chosen by the researcher as the subject of his research.

Of the 12 validators, researchers concluded that the quality of the self-assessment application made had good quality in terms of content feasibility, language feasibility, presentation feasibility, application feasibility, and in accordance with the learning characteristics of basic pencak silat techniques.

CONCLUSION

With positive validation results by experts and statistical test results showing significant differences between the experimental group and the control group, it can be concluded that Android-based self-assessment applications in pencak silat learning are valid and effective tools in helping teachers assess learners and enabling learners to assess themselves better.

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