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Development of a decision making assessment application for recruitment of young futsal athletes in Indonesia

Rozwój aplikacji do oceny podejmowania decyzji dla rekrutacji młodych piłkarzy futsalu w Indonezji

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Abstract

Futsal is a popular sport in Indonesia which is loved by many people, so important components are needed in selecting futsal athletes so that they can maximize the athletes' future achievements. This research aims to develop an Android-based application to make it easier to recruit futsal athletes with clear and measurable selection components to help make athlete selection easier. The research method used is the Borg and Gall development design which establishes 10 research steps, but the focus that will be presented in this research includes testing the results carried out, namely through expert tests and small-scale and large-scale field testing. The results of the analysis carried out revealed that the small class user assessment data for all aspects of the product received a final score of 4.58 which indicates that the product is included in the Excellent category. The Overall Average results from large class user assessment data on all aspects of the product received a final score of 4.63 which indicates that the product is included in the Excellent category. Based on all the tests that have been carried out, the product is suitable for use and recommended for selecting young futsal athletes in Indonesia.

Keywords

application, decision making, futsal

Streszczenie

Futsal jest popularnym sportem w Indonezji, który cieszy się dużym zainteresowaniem wielu osób, dlatego ważne są składniki w selekcji sportowców futsalu, aby maksymalizować przyszłe osiągnięcia sportowców. Celem tego badania jest opracowanie aplikacji na Androida, która ułatwi rekrutację piłkarzy futsalu z jasnymi i mierzalnymi komponentami selekcji, aby pomóc w łatwiejszym doborze sportowców. Metoda badawcza wykorzystana w tym badaniu to projekt rozwoju Borga i Galla, który ustanawia 10 kroków badawczych, ale skupienie się na tym badaniu obejmuje testowanie wyników przeprowadzonych, a mianowicie poprzez testy ekspertów oraz testy w terenie na małą i dużą skalę. Wyniki analizy wykazały, że dane oceny użytkowników małej klasy dla wszystkich aspektów produktu otrzymały końcowy wynik 4,58, co wskazuje, że produkt należy do kategorii doskonałych. Ogólna średnia wyników z oceny użytkowników dużych klas we wszystkich aspektach produktu otrzymała końcowy wynik 4,63, co wskazuje, że produkt jest zaliczany do kategorii doskonałych. Na podstawie wszystkich przeprowadzonych testów produkt nadaje się do użytku i jest zalecany do selekcji młodych piłkarzy futsalu w Indonezji.

Słowa kluczowe

aplikacja, podejmowanie decyzji, futsal

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Introduction

Futsal is one of the popular sports in the world, including in Indonesia. This sport is very popular because it is usually called a mini form of football with a smaller field size and is played mostly indoors or as an indoor sport. [1] stated that this sport consists of a minimum of 7 players, on the field there are 5 players and 2 players are reserve players. [2] explains that futsal is played by 5 members from each team and is allowed to have reserve players. Futsal uses a ball that is smaller and heavier than the ball used in football games. Futsal goals are smaller, due to the smaller size of the field, and the number of players is smaller than football. [3] explains that futsal is a high-intensity sport, in playing futsal a person is required to have good physical character and good psychology too. [4] explains that in futsal, each player trains continuously and tries to play matches to find out the team's abilities. Futsal is very popular, one of the reasons is because in the sport of futsal, each group of players can compete with another group of players. To increase the experience of competing, each team needs a different group of players.

Futsal is a type of intermittent sport that requires the use of large amounts of energy originating from the cardiovascular system, alternating phases of high intensity and variable duration, varying recovery periods, sometimes active, sometimes passive with different durations in each match (Alexandre et al., 2012). [5] futsal requires fitness, flexibility, power, strength, agility, power, speed of players which is also very much needed because the game has a high tempo and is active. [6] explains that in the sport of futsal, physical ability is an important component in supporting athlete success. Training principles are needed so that training can be effective and efficient, training should refer to training principles. In the opinion of several experts above, the preparation of futsal training must consider four aspects and adhere to the rules of aerobic and anaerobic training, as well as referring to training principles [7].

To get good futsal athletes, it is necessary to select athletes who are very strict and have the right components to support the athlete's success and maximum performance. [8] stated that when selecting or recruiting athletes, a coach must be able to make appropriate and careful selections to support the athlete's success. A coach should have a definite assessment of the components of recruiting futsal athletes so that he can make early predictions for maximum performance [9]. [10] the selection of athletes by the coach is an important component that must be carried out to predict the peak of the athlete's maximum performance for success in playing futsal. [11] the stability, knowledge, training and ability of coaches in optimizing the selection of futsal athletes are important components that must be maximized for the interests of athletes as well as supporting factors for athlete success.

Physical fitness covers two areas, i.e., health-related physical fitness and skill-related physical fitness [12]. Health and skill-related physical fitness constitute a preventive effort to face threats of several cardiovascular diseases [13]. The determinant factors are two, namely, internal and external factors [14]. Physical fitness through physical activities is better to be executed with supervision from fitness practitioners to result in maximum outcomes and be able to be integrated with fitness training programs [15]. A training process has to pay attention to the duration, intensity, types of muscle contraction [16], number of training sessions, and recovery [17].

Several literature studies above reveal that futsal is a popular sport and a sport that requires good physical components, physiology to get maximum results and requires good decision-making skills in matches to support success. However, the problem in the field that often arises in futsal, especially at a young age, is that wrong decisions often occur when playing. Even though the aspect of selecting athletes supports the success of their achievements. Decision making is the final result of the athlete's implementation of basic skills. Simply put, when the selection or recruitment of athletes is not in accordance with good components, it will produce athletes who are not good either

These conditions of decision making errors in selecting futsal athletes underlie researchers to develop an athlete assessment system and for recruiting talented futsal athletes. Development is carried out through applications which will later be tested on a small scale and large scale to prove that the application will be developed in accordance with needs. The application developed is based on authentic assessment. Researchers assess that the subjectivity problem that exists in the selection process for futsal athletes at a young age can have a wide impact up to the senior level, including in almost all sports. This is because the youth level is a stage for selecting athletes who are truly worthy of being at the specified level of competition, and often worthy athletes do not qualify due to this subjectivity.

The urgency of this research is that there is no specific instrument that coaches can use to select and guide futsal talent objectively and authentically. So the selection or talent search process is more subjective and has the potential to threaten a decline in Indonesia's futsal achievements at the senior level. A small and large scale testing process is needed before this tool can finally work as it should. The instrument assessment process was carried out using the expert judgment method which presented nine experts from national and international levels, one of whom was an expert from Spain. After carrying out revisions, small-scale trials, validity tests and reliability tests, the next task is to carry out a series of assessments in the form of large-scale trials. In the next stage, the researcher intends to plan a program to improve athletes who have not achieved achievements with the instruments developed.

Research method

The research method used is the Borg and Gall development design which establishes 10 research steps, but the focus that will be conveyed in this research includes testing the results carried out, namely through expert tests and small-scale and large-scale field tests. This research aims to design an Android-based application to support the program for selecting young Indonesian futsal athletes to become outstanding athletes named Futsal A+. This research is expected to be able to become a reference for using the application in recruiting and selecting athletes by coaches based on valid, authentic assessments. Participants in this research were 34 respondents involved in the initial data survey. The small group test involved 15 adults,

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while the large group test involved 40 people. The samples are not differentiated by gender (either male or female) because the built-in application system can carry out automatic analysis using algorithms.

Participants

The research sample was selected using a random sampling technique, the selection was carried out with the subjects being licensed futsal coaches who actively train clubs in the Special Region of Yogyakarta for an initial needs survey, small trials and large trials. The assessment stage of the expert judgment test was carried out involving nine experts who were divided into three parts, namely: 1) Three material experts (one international expert), 2) Three Media Experts, and 3) Three Practitioners (Professional League Trainers) person.

Table 1. Expert Judgment Qualifications

No	Expert Category	Assessment Concentration	N
1	Material Expert	1. Sport Science (International) 2. Assessment based on Authentic Assessment 3. Assessment and Evaluation of Instruments	3
2	Media Expert	1. Sports Technology 2. Programming 3. User Interface	3
3	Practitioner Pelatih Pro	1. Professional Trainer for Men's Category 2. Professional Trainer in the Female Category 3. Professional Trainer in the Young Age Category	3
Total			9

Testing the validity of the instrument was carried out using factor analysis tests, both exploratory factor analysis and confirmatory factor analysis. Reliability test uses intraclass correlation coefficient (ICC) analysis. The initial needs survey stage was carried out involving 34 licensed trainers in DIY with the following details.

Table 2. Initial Needs Survey Participants

No	Coach Origin	Licence	N
1	Yogyakarta Province	AFC 1 & National	34
	Total		9

The initial needs survey was carried out by researchers by distributing a questionnaire containing the needs for developing decision making research instruments for young futsal athletes based on Authentic Assessment through an online survey. The survey was given to all licensed coaches under the auspices of AFP DIY who are still actively training futsal in each district/city. A total of 34 licensed trainers agreed to complete the survey. The results of the initial trainer needs survey regarding the development research carried out are as follows:

Small class trial data comes from 15 licensed futsal coaches who will train Porda DIY in 2022 from 4 districts and 1 city.

No	Question Items	Answer	
		Yes	No
1	Coaches always select/assess athletes before forming a team	34	0
2	Has a field for selecting/evaluating athlete players	4	30
3	Carry out selection/assessment of athletes 3 or more times	16	18
4	Carry out selection/assessment of athletes by playing simulations/games	26	8
5	Have carried out selection/assessment of athletes using certain instruments	4	30
6	Carry out selection/assessment of athletes referring to certain instruments	4	30
7	Requires new instruments to objectively select/assess athletes	32	2
8	Requires new instruments to select/assess athletes in the form of playing simulations/games	30	4
9	Have knowledge of authentic assessment based futsal athlete selection/assessment instruments	2	32
10	Requires authentic assessment-based athlete selection/assessment instruments	34	0
11	Enthusiastic in learning and using authentic assessment-based athlete selection/assessment instruments	34	0

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Tabel 3. Small class trial coach sample

No	Origin of Coach	Licence	N
1	Jogja City	AFC Lv.1 (1 Person)	3
2	Sleman Regency	National (2 Persons)	3
3	Bantul Regency	AFC Lv.1 (1 Person)	3
4	Kulonprogo Regency	National (2 Persons)	3
5	Gunungkidul Regency	AFC Lv.1 (1 Person)	3
	Total		15

Large class trial data was taken from 40 licensed trainers who are still actively coaching futsal clubs throughout the Special Region of Yogyakarta Province.

Tabel 4. Big class trial coach sample

No	Origin of Coach	Licence	N
1	Yogyakarta Province	AFC Lv.1 and National	40
	Total		40

Research procedure

Application development was carried out based on the results of an initial analysis regarding the need for an application for selecting or recruiting futsal athletes that has authentic standards or assessments so that it can predict future athlete success and reduce subjective risks in selecting futsal athlete seeds. Furthermore, based on the needs assessment or existing problems in the field, a technology-based application, namely Android, will be developed which can later be downloaded to make it easier to select or recruit athletes. Furthermore, after the application has been created, it will be tested on experts regarding the application content, media and trainers. The data collected is quantitative data in the form of main data and qualitative data in the form of suggestions and input from respondents as additional data. This data will provide an overview of the quality of the information that will be developed. After expert testing, it will then be tested on large-scale and small-scale test samples before it will be distributed and the application is ready for mass use both in Indonesia and outside Indonesia.

Results and discussions

Based on the results of the analysis that has been carried out, the sub-chapters for presenting the research results will be expressed into several sub-chapters, namely data results based on expert tests, namely expert and practitioner tests, material expert tests and media expert tests which can be seen in the tables below. Overall results data through experimental judges on materials, media and practicality. Table 1 below will display the material expert test results which are presented below:

Table 5. Expert Assessment Results

No	Expert	Average Value	Category
1	Material Assement	4.62	Excellent
2	Media Assesment	4.30	Excellent
3	Practitioners Assesment	4.62	Excellent

In table 1 above you can see that based on the results of application development trials carried out by material experts, media and practitioners with an overall score of 4.62 for material in the excellent category, media experts got a result of 4.30 with the overall category being excellent and the final score being 4.62 in the excellent category. Furthermore, after getting the results from testing the application which will be developed by experts, small scale and large scale testing will be carried out to see the extent of the effectiveness of the application developed by researchers to facilitate the recruitment of futsal athletes which will later support success and obtain maximum performance. Based on table 2 shown above, it can be seen that the total number is 15 trainers with national and international licenses, 3 people from Jogja City, 3 people from Sleman, 3 people from Bantul, 3 people from Kulon Progo and 3 people from Gunung Kidul. After the data and identity of the trainer, the validity data from the small scale subjects will be displayed in table 6 below:

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Table 6. The Result of Validity Test

No	Assessed aspects	Lower	x̄ Validity Value	Upper	Note
1	Display Aspects	0.396	0.71	0.889	Valid
2	Material Aspects	0.476	0.755	0.907	Valid
3	Learning Aspects	0.64	0.821	0.93	Valid
4	Aspects of Usefulness	0.307	0.673	0.876	Valid
	Overall Average	0454	0.739	0.900	Valid

The table data above is a recap of the value of the instrument validity test results by using Intraclass Correlation Coefficient (ICC) analysis on the display aspect, material aspect, learning aspect, and benefit aspect which as a whole gets an average validity value of 0.739 The number of values obtained exceeds the r value of the subject table of 15 people, which is worth 0.482, it can be concluded that the instrument question items in all aspects are declared Valid. Next, the reliability data will be displayed in table 7 below:

Table 7. The Result of Reliability Test

No	Assessed aspects	x̄ Reliability Value	Note
1	Display Aspects	0.701	Reliable
2	Material Aspects	0.767	Reliable
3	Learning Aspects	0.817	Reliable
4	Aspects of Usefulness	0.667	Reliable
	Overall Average	0.738	Reliable

Through the reliability test results, a recap of the value of the instrument reliability test results was obtained in the display aspect, material aspect, learning aspect, and benefit aspect. The average value of reliability is 0.738 The number of values obtained exceeds the reliability value is 0.60, so it can be concluded that the instrument question items in all aspects are declared Reliable. To conclude, all aspects of the instruments tested in small groups have obtained valid and reliable results. Once obtained, it will go to application testing on a small scale which is shown in table 8 below:

Table 8. User Assessment Results (Small-Scale Trial)

No	Aspect Name	Average Value	Category
1	Display Aspects	4.62	Excellent
2	Material Aspects	4.58	Excellent
3	Learning Aspects	4.57	Excellent
4	Aspects of Usefulness	4.56	Excellent
	Overall Average	4.58	Excellent

The small-scale test data in table 7 above shows that the application display aspect got a result of 4.62 in the excellent category. Meanwhile, the application material got a score of 4.58 in the excellent category, the learning aspect got a score of 4.56 in the excellent category and the usability aspect was 4.56 in the excellent category. The Overall Average results from small class user assessment data on all aspects of the product received a final score of 4.58 which indicates that the product is included in the Excellent category. Next, after getting the results from small-scale application testing. Based on table 3 shown above, it can be seen that the total number is 40 national and international license trainers who come from all over the province of Yogyakarta, Central Java. Indonesia After the data and identity of the trainer, the validity data from the small scale subjects will be displayed in table 10 below:

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Table 9. The Result of Validity Test

No	Assessed aspects	Lower	x̄ Validity Value	Upper	Note
1	Display Aspects	0.478	0.666	0.803	Valid
2	Material Aspects	0.401	0.627	0.784	Valid
3	Learning Aspects	0.550	0.708	0.826	Valid
4	Aspects of Usefulness	0.684	0.801	0.884	Valid
	Overall Average	0.528	0.700	0.824	Valid

The table data above is a recap of the value of the instrument validity test results by using Intraclass Correlation Coefficient (ICC) analysis on the display aspect, material aspect, learning aspect, and benefit aspect which as a whole gets an average validity value of 0.684 The number of values obtained exceeds the r value of the subject table of 40 people, which is worth 0.304, it can be concluded that the instrument question items in all aspects are declared Valid.

Table 10. The Result of Reliability Test

No	Aspect Name	x̄ Reliability Value	Note
1	Display Aspects	0.669	Reliable
2	Material Aspects	0.636	Reliable
3	Learning Aspects	0.712	Reliable
4	Aspects of Usefulness	0.815	Reliable
	Overall Average	0.708	Reliable

Through the reliability test results, a recap of the value of the instrument reliability test results was obtained in the display aspect, material aspect, learning aspect, and benefit aspect. The average value of reliability is 0.708 The number of values obtained exceeds the reliability value is 0.60, so it can be concluded that the instrument question items in all aspects are declared Reliable. To conclude, all aspects of the instruments tested in small groups have obtained valid and reliable results. Selanjutnya pada tabel 11 dibawah akan diungkapkan hasil uji skala besar.

Table 11. User Assessment Results (Big-Scale Trial)

No	Aspect Name	Average Value	Category
1	Display Aspects	4.66	Excellent
2	Material Aspects	4.58	Excellent
3	Learning Aspects	4.59	Excellent
4	Aspects of Usefulness	4.68	Excellent
	Overall Average	4.63	Excellent

The large-scale test data in table 12 above shows that the application display aspect got a result of 4.68 in the excellent category. Meanwhile, the application material got a score of 4.58 in the excellent category, the learning aspect got a score of 4.59 in the excellent category and the usability aspect was 4.68 in the excellent category. The Overall Average results from large class user assessment data on all aspects of the product received a final score of 4.63 which indicates that the product is included in the Excellent category. Based on all the tests that have been carried out, the product is ready to be marketed

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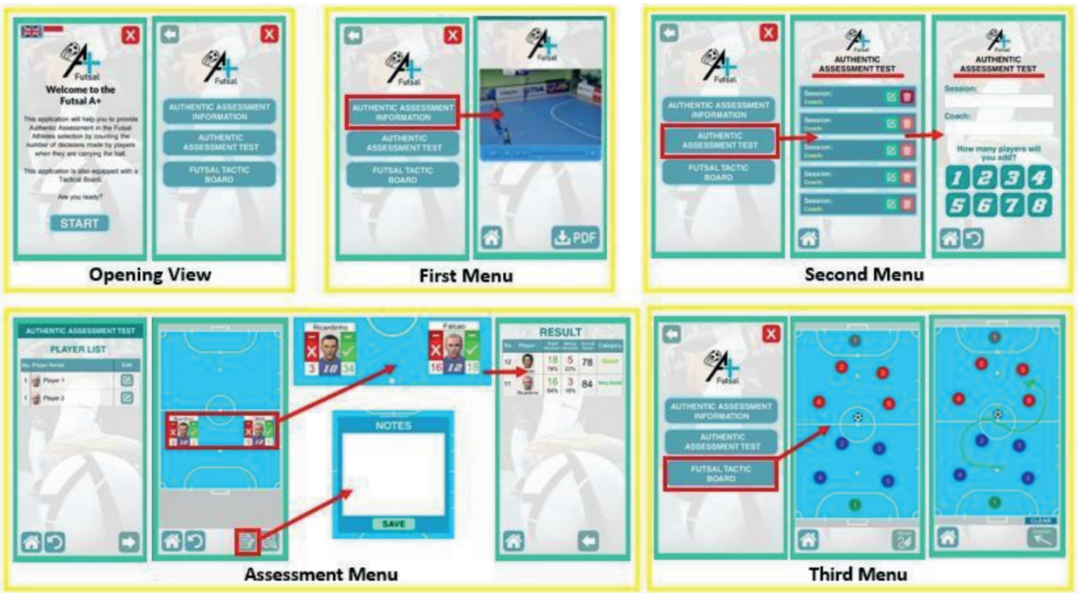

Figure 1. Application view example

1. Product Specifications

The application of the authentic assessment instrument for young futsal athletes has several specifications, namely:

1) Application name: Futsal A+ (Futsal Authentic Plus)

2) Developer: Sigit Dwi Andrianto and Friends

3) Version: 1.0

4) Year: 2023

5) Platform: Android Mobile

6) OS: Minimum OS Android 9.0 Pie

7) Processor: 832 MHZ

8) Browser: Browser WAP 2.0/xHTML, HTML

9) Free memory: 14 MB

Product Description and Discussion

Young futsal coaches can use authentic, technology-based assessment products developed by researchers through an Android application to avoid subjective recruitment on the part of the coach. It is hoped that this application will be able to provide initial identification for making decisions about admitting athletes based on their basic futsal skill abilities, be it passing, control, dribbling or shooting. Scores when athletes successfully perform and fail are recorded. The more successful the athlete is in making decisions, the higher the score. The development of this application is considered very important and it is hoped that it will be able to be used in the future considering the very different enthusiasm of the public for participating in futsal sports in Indonesia.

By using this application, it is hoped that the results obtained will be maximized because from the start the coaches and futsal management will be able to select players with talents that match the assessment or are authentic in the acceptance and search for professional playing seeds. This assessment can directly show that more experienced athletes will show success in decision making and get high scores, while less experienced athletes will fail and get low scores. Later, the coach can identify the categories of athletes who are assessed and can be declared to have passed or not. The assessment results are transparent and can be quickly conveyed to all parties, including athletes, as feedback. The results are considered objective and authentic data.

The discussion of this research, if related to previous research regarding the development of authentic assessments regarding the recruitment of futsal players, is very diverse and continues to experience development, including applications developed by researchers, but in Indonesia this development is a new research considering that there is no similar development, especially in Yogyakarta Province, Indonesia.. Several other development research studies are research results. It is felt that the development of Authentic Assessment-based instruments in the futsal sport needs to be developed to overcome the problem of subjectivity that exists in the process of talent identification and athlete selection [18]. [19] As many people know, sports coaches often apply subjectivity rather than objectivity [3] In this regard, researchers are of the opinion that subjectivity does not have a good impact on the process of identifying and nurturing talent at a young age.

Development of an Authentic application based on basic skills assessment instruments is a form of researcher assessment. his efforts and dedication to the sport of futsal. Researchers assess that the subjectivity problem that exists in the selection process for futsal athletes at a young age can have a broad impact up to senior level, including in almost all sports [20]. [6] stated that choosing a multilateral route is useful as a basis for the stage of sports specialization and provides a comprehensive fundamental motor and physical basis for children. Our discussion goes to the roots of sports talent development; early versus multilateral specialization in early

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childhood talents; and solutions in the training and development of young athletes. [21] Talent identification is a way to reveal the potential and characteristics inherent in a person from birth, including in the field of sports. In developing sports skill talent, it is important for PJOK teachers to have adequate knowledge and skills in identifying their students' talents.

[22] uses applications to find recruiting talent in sports is a practice that can predict athlete success and reduce coaches' subjective assessments of new athletes. [23] explains that an athlete's daily training sessions are often at a higher level of intensity. This kind of long-term, high-intensity training affects an athlete both physically and mentally. As a result, an athlete is no longer able to carry out high-intensity training so that before an athlete experiences this, they need the help of instruments to search for athlete talent. [24] revealed that Improvements in usability and fidelity in virtual environments are possible through combined technologies are illustrated, and different approaches are listed in their use and calculating gaze parameters. This literature review examines the possibility of integrating ET in VR, which can further be used to improve usability, method interaction, image presentation, and visual perception analysis in future physical training scenarios and athlete recruitment. The instrument in question is based on an Authentic Assessment Instrument application called Futsal A+ Instrument (Futsal Authentic Plus). Authentic instruments are considered capable of predicting the quality of the young generation of futsal athletes with precision [25].

Conclusion

The results of the assessment carried out for the small scale test as a whole obtained Average results from the small class user assessment data for all aspects of the product, getting a final score of 4.58 which shows that the product is included in the Excellent category. The results of the large-scale Overall Average test assessment from large class user assessment data on all aspects of the product received a final score of 4.63 which shows that the product is included in the Excellent category. Based on all the tests that have been carried out, the product is ready to be marketed en masse. The results of the validity test for small groups of learning aspects and benefits aspects overall obtained an average validity value of 0.739 and it can be stated that the data is valid. The results of the reliability test obtained an average reliability value of 0.738. The total value obtained exceeded the reliability value, namely 0.60, so it can be concluded that all aspects of the instrument question items were declared Reliable. Large-scale validity test scores are scores from instrument validity tests using Intraclass Correlation Coefficient (ICC) analysis on appearance aspects, material aspects, learning aspects and benefits aspects which overall obtain an average validity value of 0.684. The number of values obtained exceeds the r value The subject of the table is 40 people with a value of 0.304, so it can be concluded that all aspects of the instrument question items are declared valid. Meanwhile, the large-scale reliability results obtained exceed the reliability value of 0.60, so it can be concluded that all aspects of the instrument question items are declared reliable and ready for mass use.

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