

(A+ Futsal) Authentic Assessment Instrument for Young Futsal Athletes: Are They Valid and Reliable?

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Received March 13, 2023; Revised May 19, 2023; Accepted June 11, 2023

Cite This Paper in the Following Citation Styles

(a): [1] Sigit Dwi Andrianto, Soni Nopembri, Subagyo, Hedi Ardiyanto Hermawan, Yudanto, José Vicente García-Jiménez, "(A+ Futsal) Authentic Assessment Instrument for Young Futsal Athletes: Are They Valid and Reliable?," *International Journal of Human Movement and Sports Sciences*, Vol. 11, No. 4, pp. 824 - 831, 2023. DOI: 10.13189/saj.2023.110416.

(b): Sigit Dwi Andrianto, Soni Nopembri, Subagyo, Hedi Ardiyanto Hermawan, Yudanto, José Vicente García-Jiménez (2023). (A+ Futsal) Authentic Assessment Instrument for Young Futsal Athletes: Are They Valid and Reliable?. *International Journal of Human Movement and Sports Sciences*, 11(4), 824 - 831. DOI: 10.13189/saj.2023.110416.

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Abstract This research is a development research that aims to: 1) Develop an application-based Authentic Assessment instrument, 2) Conduct an expert judgement assessment, 3) Conduct a small-scale trial assessment. 4) Conduct validity tests and instrument reliability tests. The research steps taken include: 1) Initial product design, 2) Product manufacturing, 3) Revision, 4) Manufacture of trial products, 5) Small trials, 6) Revision of small trial products. The research was conducted in Yogyakarta. The research subjects at the expert judgement assessment stage are 9 experts consisting of 3 Material Experts (national and international), 3 Media Experts, and 3 professional league futsal coach practitioners. The subjects in the small-scale trial were 15 licensed youth futsal coaches who trained Porda DIY in 2022 representatives from 1 city, and 4 counties (3 coaches each). Instrument assessment is carried out through questionnaires. The assessment results from experts get the following grades: 1) The Three Material Experts gave an average final score of 4.62 with the excellent category, 2) The Three Media Experts gave an average final score of 4.30 with the excellent category, 3) The Three Practitioners gave an average final score of 4.62 with the excellent category, 4) The results of the assessment of a small group trial with the study subjects of 15 coaches after young people got a final score of 4.58 with an excellent category, 5) The result of data for normality test indicates the average value of 0,095 (>0,05), so that the data is stated normal, 6) The

Validity Test results with intraclass correlation coefficient (ICC) analysis on four aspects get an average value of 0,739 so that they are declared valid and the Reliability Test results achieve average value of 0.738 so that they are declared Reliable. On this basis, the instrument was declared ready for trial in large groups.

Keywords Instruments, Authentic Assessment, Validity, Reliability

1. Introduction

The process of improving sports achievement is a long mechanism that in its course involves many parties, multi-disciplines, and the use of cutting-edge technology [1]. One of the reasons for the lag in a country's sports achievement ranking is due to the lack of effort in the identification and talent search process [2]. This process was considered necessary to create regeneration for future athletes. One of the efforts that can be made to get talented athletes is by identifying and searching for talent [3][4]. The TID program has grown in popularity and is seen as an important avenue to maximize the potential of athletes to achieve success [5][6].

The talent identification process requires an instrument [7][8]. The development of instruments in support of talent

identification can be done by presenting freedom to athletes in making decisions according to the chosen one [9]. One of the instruments that can be developed based on the freedom of athletes in making decisions is an instrument based on Authentic Assessment [10]. Authentic Assessment can be interpreted as an assessment process based on conditions that are made as close as possible to reality [11]. This is very different from conventional judgments using answer sheets such as text paper and pencils which far reflect the actual state of the situation [12].

There are many studies that describe the importance of authentic assessment in sports as empirical reasons for the benefits, objectivity, and improvement of the final results of authentic assessment-based assessments. [13], including research by Fuentes-nieto et al., 2022 entitled A Combination of Transformative and Authentic Assessment Through ICT in Physical Education [14], and research by Murphy et al., 2017 entitled "Keeping it Real": A review of the benefits, challenges and steps towards implementing authentic assessment [6]. From the references of the two studies, the researcher carried out the process of developing the Authentic Assessment instrument.

The development of Authentic Assessment-based instruments can also be carried out for young athletes. In its implementation so that it is current, the development of instruments based on Authentic Assessment can be developed utilizing existing technology. One of them is by developing android-based application software. This is important to do so that the instruments made can be used by all parties, are easy to distribute, and are also environmentally friendly.

The development of instruments based on Authentic Assessment in the sport of futsal is felt to need to be developed to overcome the problem of subjectivity that exists in the process of talent identification and athlete selection [15][16]. As many know, sports coaches often apply subjectivity rather than objectivity [17]. In this regard, researchers believe that subjectivity does not have a good impact on the process of identifying and guiding talents at a young age [18][19].

The development of application-based Authentic Assessment basic skill instruments is a form of researchers' efforts and dedication to the sport of futsal. Researchers assess that the problem of subjectivity that exists in the selection process of athletes in the sport of futsal at a young age can have a broad impact up to the senior level, including in almost all sports [20][21]. This is because the young age level is the stage to choose athletes who are truly worthy to be at the specified level of competition, and often decent athletes do not qualify as a result of this subjectivity [22]. The problem that exists today in Indonesia is that there are many coaches of young futsal athletes who do not guide talents objectively and authentically, so that athletes who have better quality often do not pass the selection process. If left unchecked, the estuary of Indonesia's achievements, especially futsal, has the potential to

decline.

Researchers felt the need to develop an instrument that truly represented the quality of young athletes in actual games. The instrument in question is an application-based Authentic Assessment instrument named the Futsal A+ (Futsal Authentic Plus) instrument. Authentic instruments are considered capable of predicting the quality of young futsal athletes with precision [23][24], because this instrument makes it easy for futsal coaches to be able to assess objectively and provides flexibility for futsal athletes to be able to freely use any basic skills when playing to be chosen correctly (decision making) [25]. From the accuracy of the selection of these basic skills, the coach can make an assessment on the athlete while playing. The instrument will be integrated with an android-based software application, so that trainers can make assessments more easily, cheaply, and accurately. Researchers hope that the development of an application-based Authentic Assessment instrument (Futsal A+) for futsal sports can be realized in order to improve Indonesia's futsal achievements, because until now the instrument does not exist.

This research will be conducted in Yogyakarta Province which is included in the province that has the highest interest in playing futsal in Indonesia. An Expert Judgement assessment is carried out consisting of Material Experts, Media Experts, and Practitioners (professional futsal coaches). Furthermore, a quantitative analysis of small-scale assessment data with validity tests was carried out, and instrument reliability tests using factor analysis. The results of the validity and reliability of the research instrument will be the basis for all young futsal coaches to be able to select athletes objectively and authentically. The specific objective of this study is to develop a futsal basic skills test instrument for young athletes based on Authentic Assessment. The product to be produced is an android application-based assessment instrument.

The urgency of this research is that there are no special instruments that coaches can use to objectively and authentically select and guide talents in the sport of futsal. So the selection process or scouting of talents is more subjective and has the potential to threaten the decline of Indonesian futsal achievements at the senior level. A validity and reliability test process is needed to find out to what extent the app-based Authentic Assessment instrument can run as it should. The instrument assessment process is carried out by the expert judgement method presenting nine experts from the national and international levels, one of whom is an expert from Spain. After revisions, small-scale trials, validity tests and reliability tests, the future work is to conduct a series of assessments that are large-scale trials. In the further stage, the researchers will intend to plan programs to increase the athletes who have not achieved the score/ performance yet.

2. Materials and Methods

The research design used follows the research steps of Research and Development by Borg and Gall. The stage carried out is an assessment by nine experts from the national and international levels. Furthermore, small group tests, validity tests, and reliability tests are carried out. The process of testing the validity and reliability of the instrument is necessary to know to what extent the application-based Authentic Assessment instrument can run well and be measured accordingly.

2.1. Participants

The subjects of the study were 9 expert judgements and 15 futsal coaches licensed by PORDA DIY with the following details.

Table 1. Expert Judgement Qualification

No	Categories of Experts	Expertise point of view	N
1	Material Expert	1. Sport Science 2. Authentic Assessment- based Assessment 3. Assessment and Evaluation of Instruments	3
2	Media Expert	1. Sports Technology 2. Programming 3. User Interface	3
3	Practitioner (Professional Coach)	1. Professional Coach in the Male Category 2. Professional Coach in the Women's Category 3. Professional Coach in the Young Age Category	3
Total			9

The expert judgement of this study is 9 people divided into 3 Material Experts, 3 Media Experts, and 3 Practitioners. Each expert has its own concentration in each assessment, so the data produced is a combination of various elements of specific skill concentration. The hope is that the assessment on the application instrument being developed is truly representative. This research was conducted for 6 months at the UNY Yogyakarta Indonesia Sports Building.

Table 2. PORDA DIY Licensed Trainer

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

The subjects of the small group trial study totaled 15 people who are 2022 DIY Porda coaches from 1 city and 4 counties, so each district or city sends 3 coaches. All subjects are licensed coaches of at least National Level I (Basic) and AFC Level I (Amateur).

2.2. Methods

The research and development design used in this study is a development modification that refers to the Borg and Gall development method with the steps taken including:

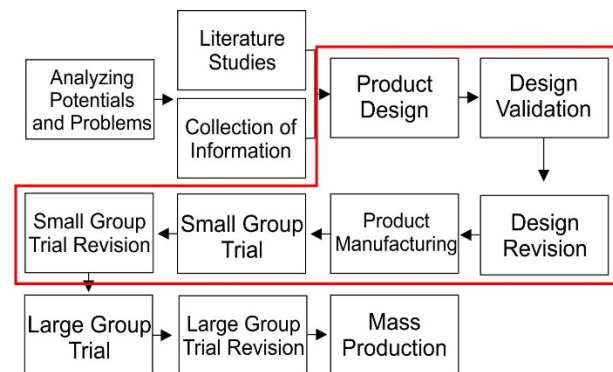


Figure 1. Borg and Gall's Research & Development Method

(1) Analyzing potentials and problems, (2) Literature study and information collection, (3) **Product design**, (4) **Design validation**, (5) **Design revision**, (6) **Product manufacturing**, (7) **Small group trial**, (8) **Small group trial product revision**, (9) Large group trial, (10) Large group trial product revision (11) Mass Production. The focus of this study is on stages **3, 4, 5, 6, 7 and 8**.

The data collected is in the form of quantitative data as the main data and qualitative data in the form of suggestions and input from respondents as additional data. The data will provide an overview of the quality of the information that will be developed in the form of: 1) Data from Material Expert: in the form of product quality in terms of learning and material aspects, 2) From Media Expert data: in the form of quality display techniques, and programming. 3) Data from Practitioners (Professional Futsal Trainers): in the form of product quality and accuracy in terms of effectiveness and usefulness. 4) Data from licensed Coaches (DIY Porda Coaches): used to analyze the attractiveness and accuracy of instruments in the selection process of young futsal athletes through display aspects, material aspects, learning aspects, and benefit aspects. The scale used is the likert scale. There are 4 kinds of instruments used, tailored to their respective designations both for experts, practitioners, and users. More detailed items of instrument questions can be observed in the following table:

Table 3. Assessment Instruments for Material Experts

No.	Indicator
Learning Aspect	
1	Clarity of guidance instructions
2	Accuracy of choosing the materials used for the guide
3	The correctness of language selection in deciphering products
4	Clarity of examples
Material Aspect	
6	Product correctness
7	Product recency
8	Product attractiveness
9	Product depth
10	Product collapse
11	Product scope
12	Ease of product to understand
13	Product actuality
14	Language use provisions

Table 4. Assessment instruments for Media Experts

No.	Indicator
Display Aspect	
1	Accuracy of background color selection
2	Text color alignment with background
3	Clarity of narrative
4	Button placement
5	Button consistency
6	Button size
7	Precise choice of button color
8	Accuracy of text color selection
9	Correctness of font selection
10	Accuracy of font size
11	Image clarity
12	Color clarity of the image
13	Image size accuracy
14	Slide design view
15	The composition of each slide
16	Theme alignment
Program Aspect	
17	Ease of interacting with guides
18	Clarity of instructions for use
19	Clarity of navigation structure
20	Ease of use of buttons
21	Text Efficiency
22	Efficiency of using slides

Table 5. Assessment Instruments for Practitioners

No.	Indicator
Learning Aspects	
1	Clarity of guiding instructions on the application for use
2	The accuracy of choosing the material used for the application
3	The accuracy of language selection in explaining the content on the application
4	Clarity of examples on the application
Material Aspect	
6	Correctness of the content on the application
7	Recency of the application
8	Attractiveness of the application
9	Depth of content on the application
10	Content collapse on the application
11	Scope of contents on the application to use
12	Ease of material to understand when used
13	Actuality of the content of the material to use
14	Provisions for the use of language in the application for use

Table 6. Assessment instruments for Users

No.	Indicator
Display Aspect	
1	Clearly legible writing
2	Clarity of instructions for use
3	Ease of selecting menus
4	Ease of use of buttons
5	Clarity of button functions
6	Color clarity of the image
Material Aspect	
7	Clarity of the material
8	Language silliness
9	Language clarity
10	Image clarifies the material
Learning Aspect	
11	Easy to learn material
12	Interesting material
13	Supporting materials in the work of the coach
14	Ease of selecting the guide menu
15	Clarity of product instructions
16	Guides are not boring
17	How to present more attractive
18	Provide new information for users
Usefulness Aspect	
19	Make a positive impact on its users
20	Add user skills
21	Independently help learning new things
22	Provide benefits in supporting the activities carried out
23	Make it easier to carry out the activities carried out

2.3. Result

The results of the assessment of the nine experts (expert judgment) can be observed in each according to the grouping of experts. Then the following are data on normality, validity and reliability test results, presented by an aspectual category.

2.3.1. Material Expert Assessment Results

Table 7. Material Expert Assessment Results

No	Aspect Name	Average Value	Category
1	Learning Aspects	4,58	Excellent
2	Material Aspects	4,66	Excellent
Overall Average		4,62	Excellent

The assessment results from three Material Experts obtained the following data, 1) The learning aspect achieved a score of 4.58 with an excellent category, 2) The material aspect got a score of 4.66 with an excellent category, so that on average all assessments from the Material Expert got a score of 4.62 with an excellent category.

2.3.2. Media Expert Assessment Results

Table 8. Media Expert Assessment Results

No	Aspect Name	Average Value	Category
1	Display Aspects	4,66	Excellent
2	Programming Aspects	3,94	Good
Overall Average		4,30	Excellent

The assessment results from the three Media Experts obtained the following data, 1) The display aspect got a score of 4.66 with the excellent category, 2) The programming aspect got a score of 3.94 with a good category, so that on average all assessments from the Media Expert got a score of 4.30 with an excellent category.

2.3.3. Practitioner Assessment Results

Table 9. Practitioner Assessment Results

No	Aspect Name	Average Value	Category
1	Effectiveness Aspects	4,58	Excellent
2	Aspects of Usefulness	4,66	Excellent
Overall Average		4,62	Excellent

The assessment results from three Practitioner coaches obtained the following data, 1) The Effectiveness Aspect got a score of 4.66 with an excellent category, 2) The

benefit aspect got a score of 4.66 with an excellent category, so that on average all assessments from the trainer Practitioner got a score of 4.62 with an excellent category.

2.3.4. User Assessment Results (Small-Scale Trial)

Table 10. 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 assessment results from 15 users (young futsal coaches) obtained the following data: 1) The Display Aspect got a score of 4.62 in the excellent category, 2) the Material Aspect got a score of 4.58 in an excellent category, 3) the Learning Aspect got a score of 4.57 with an excellent category, 4) The benefit aspect got a score of 4.56 in an excellent category, so that on average all ratings from Users (young futsal coaches) got a score of 4.58 in Excellent categories.

2.3.5. Description of Product Application

Futsal athletes can use the authentic assessment-based instrument product developed for decision-making through an Android-based application. The assessment is carried out when athletes perform one of the basic futsal skills, be it passing, controlling, dribbling, or shooting. Scores when athletes successfully perform and fail are recorded. The more successful the athletes in making decisions, the higher the scores. This assessment is in line with the theory of novice athlete reaction to anticipating playing problems [26], that athletes with more training experiences will have better sensitivity and movement speed in decision-making.

The assessment process is only carried out when the athlete gets the opportunity to play and is carrying the ball (on the ball movement). The coach is only required to press either "success" or "failed" button when an athlete succeeds or fails in performing one of the above basic skills. Grades will be accumulated and converted by the application system at the end of the assessment. This assessment can directly tell that more experienced athletes will show success in decision-making and get high scores, and less experienced ones will meet failures and acquire low scores. Eventually, the coach can identify the assessed athletes' category and whether they can be declared qualified or not. Assessment results are transparent and can be quickly delivered to all, including athletes, as feedback. The results are regarded as objective and authentic data.



Figure 2. Application view example

2.3.6. 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
- 10) Output format : JPEG

Here is an example of what the application looks like (Figure 2).

2.4. Statistical Analysis

Here is the data for normality test (Shapiro-wilk).

Table 11. The Result of Normality Test

No	Assessed aspects	\bar{x} Normality Value	Note
1	Display Aspects	0,107	Normal
2	Material Aspects	0,087	Normal
3	Learning Aspects	0,116	Normal
4	Aspects of Usefulness	0,072	Normal
Overall Average		0,095	Normal

The result of data for normality test indicates the average value of 0,095 (>0,05), so the data is stated as normal. Validity and reliability tests at a 0.05 significance level or a 95% confidence level were used in our statistical analysis of instruments. The R-table acquired with 15 subjects was 0.514, and a minimum standard of 0.60 was used in the reliability test.

Table 12. The Result of Validity Test

No	Assessed aspects	Lower	\bar{x} 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		0,454	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 0.514, it can be concluded that the instrument question items in all aspects are declared Valid.

Table 13. The Result of Reliability Test

No	Assessed aspects	\bar{x} 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.

3. Conclusions

The assessment results of three Material Experts got an average score of 4.62 with an excellent category. The results of the assessment of three Media Experts on getting an average score of 4.30 with an excellent category. The results of the assessment of three Practitioners got an average score of 4.62 with an excellent category. The assessment results from 15 users (young futsal coaches) got an average score of 4.58 with an excellent category.

Validity Test results on four aspects consisting of display aspects, material aspects, learning aspects, and usefulness aspects get an average score of 0.660 and greater than r table 0.514 so that it can be said to be a Valid instrument. The reliability test results get an average score of 0.715 and greater than the alpha value of 0.60, so it can be said to be a reliable instrument. On the basis of some of the results above, the instrument is declared ready to be tested on a larger sample (Large Group Trial).

Acknowledgements

Thanks to the Faculty of Sports Science and Health, Yogyakarta State University, as the funder of the DIPA FIKK UNY research and the students of the Faculty of Sports Science and Health, so that this research can be carried out correctly.

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