Improving Instrument Test Passing and Controlling based Digital Futsal Athletes: Quantitative Study

Roma Irawan*
Sport Science Faculty, Universitas Negeri Padang, Indonesia.
E-mail: romairawan@fik.unp.ac.id

Subro Albi
Sport Science Faculty, Universitas Negeri Padang, Indonesia.

Umar
Sport Science Faculty, Universitas Negeri Padang, Indonesia.

Arsil
Sport Science Faculty, Universitas Negeri Padang, Indonesia.

Anton Komaini
Sport Science Faculty, Universitas Negeri Padang, Indonesia.

Didik Rilastiyo Budi
Faculty of Health Sciences, Jenderal Soedirman University, Indonesia.

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Abstract

The problem in this research is that there is notest instrument passing and control designed according to the situation and condition of futsal athletes who follow digital developments in the West Sumatran environment, especially Padang State University. The purpose of this study was to make a prototype of a test instrument passing and control digital-based futsal athletes. This research is development research with a model design adapted from Borg & Gall. The research subjects were Futsal Athletes from the Faculty of Sport Science, Padang State University, and six experts, namely two Evaluation and Measurement Test experts, one Futsal Expert, and three IT Experts. The development of the test instrument for passing and control futsal athletes was carried out by testing the futsal athletes of Sport Science Faculty, Universitas Negeri Padang, Indonesia using a small group test of 30 people and a large group test totaling 177 people on futsal athletes in the city of Padang, where the method used was the expert validity method with an assessment using a questionnaire instrument and the method test and retest to test the reliability of the tool which was analyzed using the correlational r formula. The process of developing the test instrument for passing and control

futsal athletes was carried out through the first stages, namely looking for potential problems, data collection, product design, design validation, design revision, product testing, product revision, usage trial, and product revision. Then the expert validation test was carried out with a questionnaire assessment so that 90% validity was obtained in the "Very Good / Decent" category and the validation level by the large group judge was 0.996 the "very high" category and the small group judge validation level was 0.997 "very high" with a small group reliability test of 0.997 and the large group of 0.996 with both reliability categories "High", the practicality value was 91% and the effectiveness value was 88%. Thus, it can be concluded that the test instrument is passing and control digital-based futsal athletes used as a measuring tool to measure passing and control.

Keywords

Instrument, Athletes, Passing and Control, and Futsal.

Introduction

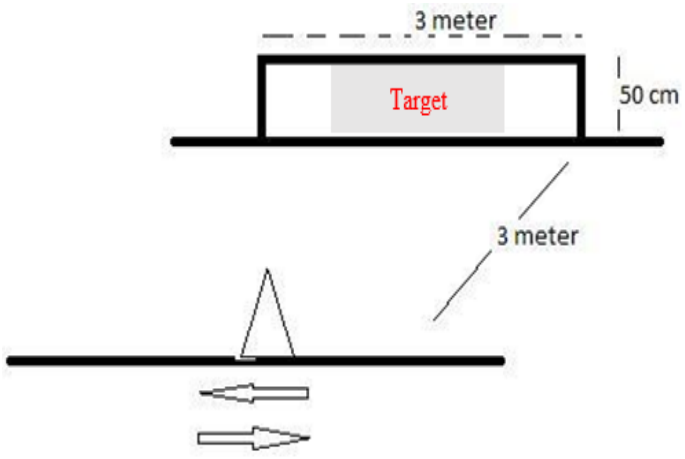
Futsal is a popular sport in Indonesia and favored by all levels of society, especially men and women ranging from children, adolescents, and adults. This is evidenced by the many competitions between students, students, age groups, and the general public. This factor is in line with the number of schools that have started to hold futsal extracurriculars as one of the sports of choice and there are also various futsal academies in areas that are starting to emerge. Efforts to improve futsal sports performance continue to be carried out, but it should be noted that three basic elements must be mastered by futsal players, namely basic techniques, skills, and individual tactics, because whatever the pattern/strategy given by the coach, what if the three components above are not mastered by the player, the system will not work. According to Mia Wahyuni Arta and Bafirman in the Satamina Journal (2019), agility is the ability to change direction quickly and precisely.

In the world, there are two international futsal bodies, namely AMF (Association Mundial de Futsal) with POFI (Indonesian Futsal Sports Association) as its representative in Indonesia and FIFA which oversees football (men and women), futsal, beach football with PSSI as its representative in Indonesia. Playing futsal is not much different from playing football in general. Sports require stamina, mentality, and strategy. There are a few basic differences in terms of play patterns and attack settings. The pattern of play in futsal is dominated by foot-to-foot games. This means that the arrangement in defending and attacking is mostly done with short passes, considering the size of the field is smaller than a football field. A good futsal player must be equipped with good knowledge and basic futsal technical skills because it is the initial basis for a futsal player. In this study, the

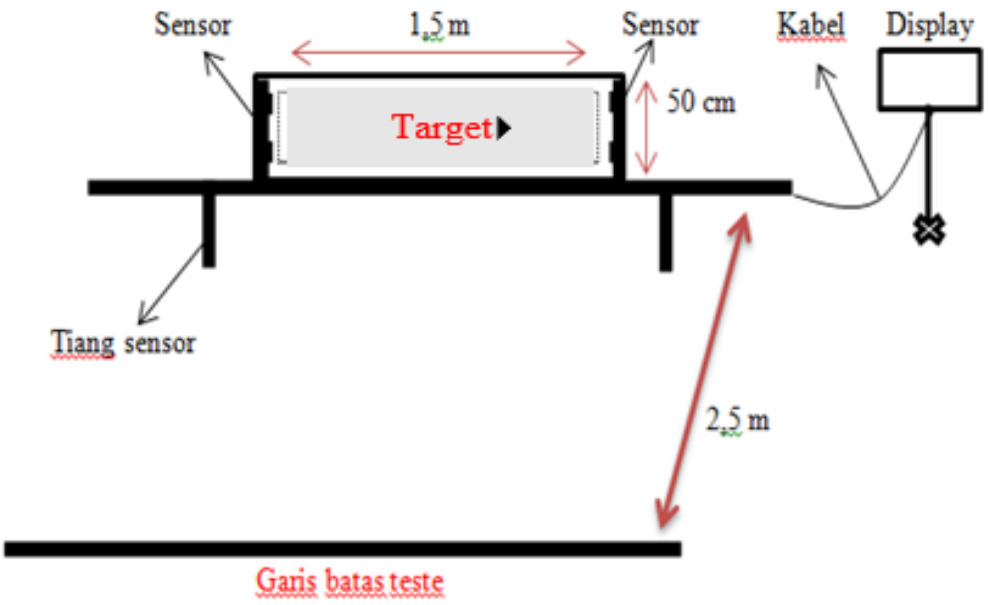
basic technique test instrument for passing and control was developed. Passing and control itself is a very important basic technique in futsal, it can be said that if someone cannot do passing and control then that person cannot play as a professional player. In the game of futsal, the continuous movement of players also causes players to continue to pass, almost ninety percent (90%) of futsal games are filled with passing. Players who do not have good passing and control skills, the appearance of these players will not be as expected, so to get good quality basic passing and control techniques, special training is needed to achieve them so that the futsal sports game is more leverage (Gede Noviada, I Nyoman Kanca & Gede Eka Budi Darmawan 2014).

"Passing is one of the basic techniques that every player needs. A flat field and a small field size require hard and accurate passing because the ball is sliding parallel to the player's heel". The test instruments passing and control futsal that is often used are still manual counts and with tests of passing and controlling the ball against the wall/board which are still relatively common, as in research (Abdul Narlan, Dicky Tri Juniar, Haikal Millah), the results of tests for passing and controlling the ball (Passing-Controlling) shows that the level of reliability of the futsal skill test is still low (0,3851). Based on the above, the researchers think to make the test apparatus passing and control digital-based futsal inspired from the test feed and control the ball (Passing-Controlling). Where the form and work system are made different using digital tools that calculate the amount and time automatically.

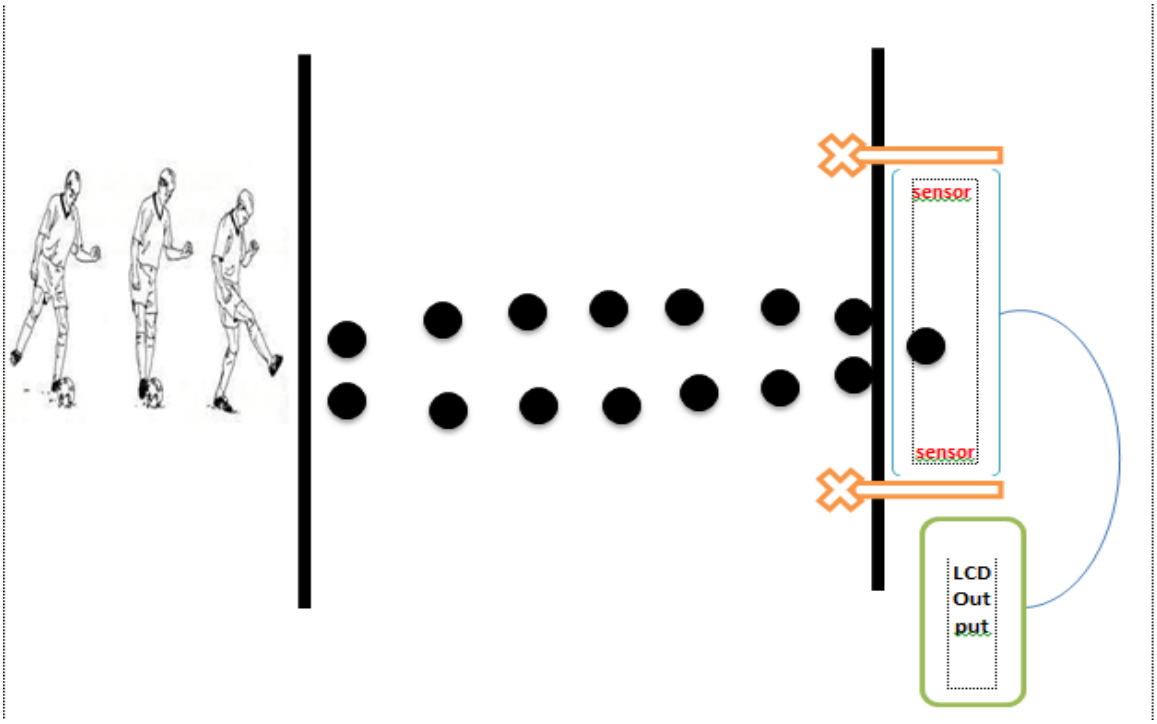
Sketch of Test Instruments *Passing* and *Control*



Picture 1 Before being developed



Picture 2 After being developed



Picture 3 Illustration of the use of test instruments passing and control digital-based futsal athletes

Method

This research method is research and development (Research and Development). This research method is the method used to produce a particular product, and test the

effectiveness of the product. This study aims to develop instrument passing and control for a digital-based futsal athlete. In addition, this study aims to produce a renewable and efficient instrument by utilizing a photoelectric sensor or remote detection sensor where the sensor will emit a wave, when the wave is disconnected the auto timer will be active as a measurement indicator that has excellent measurement accuracy for measuring passing. and control of futsal athletes compared to instruments passing and control another manual. This study developed instrument passing and control a digital-based futsal athlete's. The stages or steps of research and development in this research are as follows; 1) potential problems, 2) data collection, 3) product design, 4) design validation, 5) design revisions, 6) product trials, 7) product revisions, 8) usage trials, 9) product revisions and 10) production mass (Borg and Gall in Sugiyono, 2010).

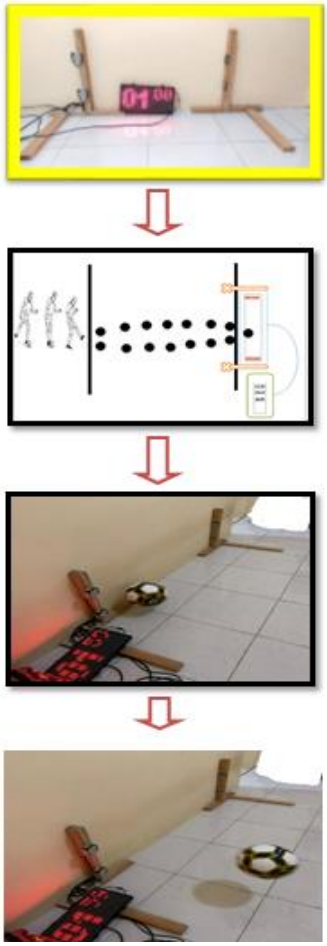
In the group trial stage, the researcher used a small-scale trial sample of 30 men, while the large-scale trial amounted to 177 men. The sample of this research is Futsal athletes in Padang City aged between 19-25 years, the technique sampling used is the technique, Purposive Sampling namely a conditional sample where the sample used is a sample that 1) is 19-25 years old, 2) has participated in a minimum futsal championship regional level.

Expert validation is carried out by asking for expert judgment by filling out questionnaires provided in certain fields such as Evaluation and Measurement Test experts, Futsal experts, and IT experts and validation by judges. Reliability was obtained by calculating the correlational value of small group trials and large group trials using the method Test and Retest, practicality and effectiveness were obtained from the points of practicality and effectiveness in the assessment questionnaire of each expert.

Equipment and Materials

Development of measurement tools (instruments) passing and control athletes futsal-based digital technology requires measuring equipment and electronic components, such as power supply, photoelectric sensors, microcontroller ATmega328 and Arduino Uno Rev 3, the circuit interfacing and display (LCD) as the appearance of a digital reading which will be assembled and connected using a USB 3.0 cable to produce an output of measurement data in the form of how many passes and controls are carried out properly and correctly for 60 seconds with two repetitions.

Illustration



Picture 4 Equipment and Materials

Operational Steps of the Tool

The tool's operating manual aims to enable users to assemble and install the tool so that it can function properly and properly. The operational steps for the tool are as follows:

a. Prepare the tool in a flat location, with walls and wide walls so that the tester is free to carry out the test.
b. Arrange several of these components so that they become a unified test instrument.
c. If the tool has been installed it will look like in the following picture
d. Turn on the instrument by connecting the instrument to a source of electrical energy.
e. Do a check on the LCD.
f. Place the right/left foot behind the ball in a position ready to pass and the ball position behind the line

g. Perform movements passing and control correctly alternately between the right foot and left foot and the position of controlling the ball is carried out behind the line. When the first kickball bounces off the wall and breaks the sensor then the time automatically starts counting and the number one appears, this is done continuously for 60 seconds with two repetitions. After the time runs out automatically the counting stops, then the display shows how many passes we did during the 60 seconds.
h. View the test results on the LCD.
i. Assessment The test is carried out when the teste performs movements passing and control.
j. The time automatically counts when the ball hits/breaks the sensor.
k. The time located on the display screen automatically counts down and the number increases when the ball disconnects the sensor continuously.
l. The total number on the display stops counting when the time runs out.
m. The best number and the best execution of the test by doing passes and control as many as well and correctly within 60 seconds with two repetitions and the best number is taken.

Results and Discussion

The process of developing the test instrument for passing and control futsal athletes was carried out through the first stages, namely looking for potential problems, data collection, product design, design validation, design revision, product testing, product revision, usage trial, and product revision. Then the validity test used is expert validity with a questionnaire assessment so that 90% validity is obtained in the "Very Good / Decent" category. consists of 2, 1, 3 experts in each of these elements so that the total experts involved are 6 experts, and validation by a judge is 3 futsal coaches. The reliability test for the small group of men is 0.997, and the large group of men is 0.996, with the reliability category "High". Practicality and Effectiveness Obtained a practical value of 91% and an effective value of 88%. Thus, it can be concluded that the test instrument is passing and control digital-based futsal athletes used as a measuring tool to measure passing and control.

Discussion

Product of developing instrument passing and control futsal athletes produces a product that makes it easier to measure the passing and control of a digital-based futsal athlete that is designed to adapt to the conditions of the futsal athlete in the field.

According to Arikunto (2002), an instrument that can be said to be good is an instrument that must have a tested level of validity and validity. Furthermore, according to Darmadi (2011), a good instrument is an instrument that has a must, namely a high level of validity. Maryunis (2007) explains that reliability is the consistency value of an instrument.

Table 1 Category Correlation Coefficient Reliability Small group Male

Number of	Gender	Correlation coefficient	Reliability
30	Male	0.997	Very Strong

Source: primer 2020

Table 2 Category Correlation Coefficient Reliability Large group Male

Total	Gender	Correlation coefficient	Reliability
177	Male	0.996	Very Strong

Source: primer 2020

From the table, it is known that the level of reliability of the resulting tool is "High".

Table 3 Presentation and Eligibility Level from Experts

No	Expert	Percentage (%)	Eligibility level
1	Evaluation and sports measurement tests	92	Very Good/Decent
2		91	Very Good/Decent
3	IT	90	Very Good/Decent
4		89	Very Good/Decent
5		90	Very Good/Decent
6	Futsal	90	Very Good/Decent

Source: primer 2020

From the validation results by the six experts, if on average, a percentage of 90% is obtained " Very Good/Decent" and it can be concluded that the tool developed for the test instrument is *passing* and *control* futsal athletes based on is digital can be used to measure the *passing* and *control* of futsal athletes. As for some suggestions and criticisms on the results of the prototype tool that was created as a material for further development when going to mass production so that the tool is capable of economic value and can be used regularly.

Table 4 Presentation of Practicality from Expert Assessment

No	Expert	*f*	Total	Percentage (%)	Eligibility level
1	Evaluation and sports measurement tests	14	15	93	Very Good/Decent
2		14	15	93	Very Good/Decent
3	IT	20	20	100	Very Good/Decent
4		17	20	85	Very Good/Decent
5		17	20	85	Very Good/Decent
6	Futsal	9	10	90	Very Good/Decent

Source: primer 2020

From the results of the validation by the six experts, if the average practical value is obtained a percentage of 91% and it can be concluded that the tool developed The passing and control of digital-based futsal athletes has a “Very Good/Decent” level of practicality.

Table 5 Presentation of Effectiveness of Expert Assessment

No	Expert	*f*	N	Percentage (%)	Eligibility level
1	Evaluation and sports measurement test	19	20	95	Very Good/Decent
2		18	20	90	Very Good/Decent
3	IT	20	25	80	Very Good/Decent
4		21	25	84	Very Good/Decent
5		22	25	88	Very Good/Decent
6	Futsal	18	20	90	Very Good/Decent

Source: primer 2020

From the results of the validation by the six experts, if the average effectiveness value is obtained, a percentage of 88% is obtained and it can be concluded that the tool developed The test instrument passing and control digital-based futsal athletes has an "Excellent/Decent" level of Effectiveness.

Conclusion

The conclusion of this research is the creation of a test instrument passing and control special futsal which has an assessment percentage of 90%. This can be interpreted that the measuring instrument for passing and controlling the futsal sensor has a "good/decent" category and the validation level for large group judges is 0.996 "very high" and the validation level for small group judges is 0.997 "very high". The results of the reliability calculation using the test and retest technique obtained the value of r for small group trials of 0.997 for and large group trials of 0.996 for men with the "High" category, obtained practicality values of 91% and effectiveness values of 88%. The next research is the refinement of this test instrument passing and control by simplifying the component circuit and maximizing the measurement by adding a reflection board and changing the material component for the sensor.

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