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Development of individualized passing media to train digital-based short passing accuracy

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Abstract

This research aims to develop a tool to train short passing accuracy in soccer. This research applied a Research and Development research. The development of this digital-based individual passing tool is carried out in several stages, namely: (1) preliminary studies, (2) product manufacturing, (3) expert validation and revision, (4) product trials; and (5) final product. Respondents of the small-scale trial amounted to 10 people and respondents of the large-scale trial amounted to 30 people. The data collection technique used in this study was an instrument in the form of an assessment sheet. The result of this research is the development of an individual passing tool to train short passing accuracy in football. The developed tool is feasible to use as a passing accuracy training instrument in football. Based on the small group trial, the percentage of 80.6% is included in the good/acceptable category and the large group trial of 82.3% is included in the very good/acceptable category.

Keywords: Passing media, digital, accuracy, acceptable category

1. Introduction

Indonesian football is one of the countries with football players who have poor passing accuracy. The results of a study by ^[1] showed that the level of passing accuracy of local professional football league 1 Indonesia 2017 athletes was in the “very less” category of 3.70% (4 athletes), the “less” category of 30.55% (33 athletes), the “medium” category of 41.66% (45 athletes), the “good” category of 12.96% (14 athletes), and the “very good” category of 11.11% (12 athletes). From the data it can be seen that level one soccer athletes in Indonesia are still dominated by athletes with very poor, poor and moderate levels of passing accuracy with a percentage of 75.91%, while the good and very good categories are only 24.07%. From this data, the researcher assumes that to improve this condition, there needs to be something new to make the training process for athletes (young age) better in the future.

Law of the Republic of Indonesia number 3 of 2005 concerning the National Sports System in article 74 paragraph 1 states that the Government, Regional Governments, and / or the community carry out sustainable development of science and technology to advance national sports. The development of science is always followed by the development of technology. Technology is a systematic study of techniques for making and working on various objects, while science is a systematic effort to understand and interpret the world ^[2]. New technology in this research is in the form of digital-based media used for passing training which aims to improve the accuracy of short passing in soccer. Science and technology play an important role in the development of football. With the existence of science and technology, activities that were once considered difficult can now be done easily. Science and technology have a positive impact on the world of football. The utilization of science and technology is marked by the development of tools or supporting media in soccer. Quoting from ^[3], the application of science and technology that has been carried out includes goal line technology, video assistant referees, electronic performance and tracking systems (EPTS). In the training process, there are already developed media such as rebound rib. However, the development of media that utilizes technology in soccer is still mostly carried out by developed countries. The fact that is currently happening is that Indonesian football has not been maximized in applying science and technology in football.

As happens in regional clubs, there are still many or almost evenly distributed coaches who have not applied science and technology in the training process, especially in training basic passing techniques. To get media that can help the training process, the coach or club must spend a lot of money. That factor can be the reason why in clubs not many have applied science and technology in the training process. PSSI should work with human resources who are experts in science and technology to create new media to support the maximum training process. With the efforts made, it is felt that it will be able to solve the problem of this country's achievements. Maximum effort is of course directly proportional to good achievement.

Observations carried out at SSB Bina Putra Jaya on October 11, 2018, there were still many students whose basic passing technique skills were not very good, in addition to the absence of a method of training individual passing, so that students need other students to practice passing. The second observation conducted at the extracurricular soccer team of SMA N 5 Merangin on February 20, 2019, there were still many players whose passing accuracy was not good. From this, the researcher concluded that the lack of supporting media in the process of training soccer passing made the ability of basic passing techniques poor, directly proportional to the short passing accuracy of the players.

Based on this background, researchers are interested in creating a digital-based media to help practice passing independently. Seeing how important basic passing techniques are in football, in order to maximize passing

ability and short passing accuracy.

2. Materials and Methods

2.1 Type of Research

This type of research is a type of research and development (research and development). According to [4] development research is a research method used to produce certain products, and test the effectiveness of these products. Research and development serves to validate and develop products. The findings obtained in the field are used to design new products and procedures and then systematically field tested, evaluated, and refined. In other words, to produce a certain product, a needs analysis is needed and to test the effectiveness of the product.

Research and development methods are widely used in various fields of science, because to produce usefulness there needs to be innovation in technology and science so that human life is more productive, research and development is not only found in the fields of social sciences, health, management and education. In the field of coaching media, it can also be applied. In this study, the researchers intended to develop a product in the form of individual passing media to train digital-based short passing accuracy in soccer.

2.2 Development Procedure

The development procedure used in this study utilizes the Research and Development (R&D) method according to [4], the steps of research and development are shown in the following figure:

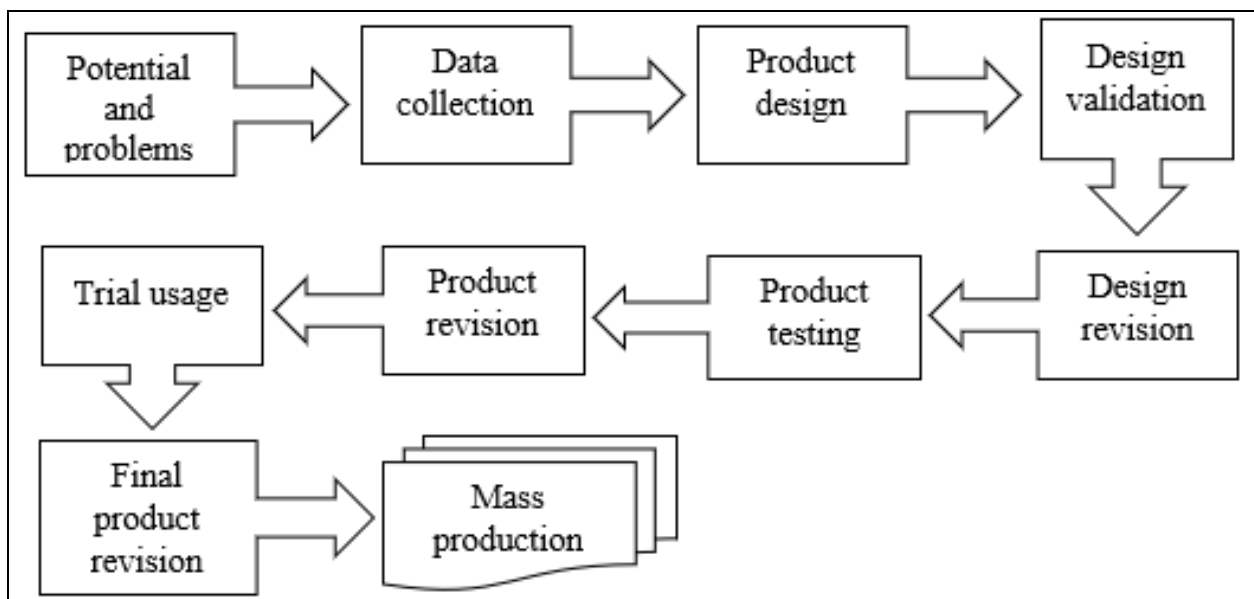


Fig 1: The steps of Research and Development

2.3 Test Subjects

This research was conducted at the Faculty of Sports Science, Yogyakarta State University. The validator subjects are media experts and material experts, while for small-scale trial subjects amounted to 10 students of Sports Coaching Education concentrating on football and to test the large scale, which amounted to 30 students of Sports Coaching Education concentrating on football.

2.4 Data Collection Techniques and Instruments

The data collection method used in this development research was a questionnaire method with a data collection instrument in the form of a questionnaire or questionnaire. According to

[5], a questionnaire is a data collection technique that is done by giving a set of written questions to respondents to answer.

The first instrument was media experts and material experts in the form of media expert evaluation sheets and material experts containing data on the results of guidance and a series of revisions during media development. Media expert assessment is related to the design and appearance of the product made. This instrument is used as material for revising the passing training media developed in terms of appearance and to make it suitable for use. As for the assessment of material experts related to soccer passing training material in the form of data from consultations and revisions during the media development guidance process about the correctness

and suitability of the material in individual passing media to train short passing accuracy in football.

The second instrument was an evaluation sheet (questionnaire) addressed to students of sports coaching education concentrating on football coaching at Yogyakarta State University, to find out whether or not individual passing media for training digital-based short passing accuracy is developed, if this media is used in the field as a passing training aid.

2.5 Data Analysis Technique

After the data from the trial results have been collected, data processing or data analysis is carried out. Data analysis technique is a way to find out the results of the research conducted. Data analysis techniques for assessing the feasibility of individual passing media to train digital-based short passing accuracy, carried out with steps as described by [6], are as follows:

$$\text{Score} = (\text{Calculated Score}) / (\text{Ideal Score}) \times 100\% \quad (1)$$

The results of the data calculation are then made in the form of a percentage multiplied by 100%. After obtaining the percentage with the formula, then the feasibility of individual passing media to train digital-based short passing accuracy in this development research is classified into four feasibility categories using the following scale:

Table 1: Categories of short passing accuracy

No.	Score in percentage	Feasibility Category
1.	< 40%	Not Good/Not Feasible
2.	40%-55%	Less Good/Less Feasible
3.	56%-75%	Fairly Good/Fair
4.	76%-100%	Good/Feasible

The questionnaire measurement uses an attitude scale, namely the Likert scale. According to [6], the Likert scale is used to measure the attitudes, opinions and perceptions of a person or group about social phenomena. In this study, it has been specifically determined by the researcher, which is hereinafter referred to as the research variable. There are 4 answer options in each questionnaire point, namely Very Good,

Table 4: Second validation of media

No	Aspects	Obtained Max Score	Max Score	Percentage (%)	Category
1	Physical	28	32	87,5	Good / Feasible
2	Design	9	12	75	Good enough / Feasible enough
3	Usage	14	16	87,5	Good / Feasible
Total score		51	60	83,3	Good / Feasible

3.1.1 Small Group Trial

Researchers tested individual passing media for digital-based short passing accuracy on students of the 2015 class of football coaching education, Faculty of Sports Science,

Table 5: The results of individual passing media in small group trial

No.	Aspects	Obtained Max Score	Max Score	Percentage (%)	Category
1.	Physical	293	360	81,4	Good / Feasible
2.	Design	126	160	78,7	Good / Feasible
3.	Usage	137	160	81,8	Good / Feasible
Total score		556	680	80,6	Good / Feasible

The results of the data above show that the questionnaire filled out by students for the development of individual passing media to train digital-based short passing accuracy in

Good, Less, and Very Less. Each point has an indicator that shows whether the result of the statement is positive or negative. For the purposes of quantitative analysis, the answer was given a score.

Table 2: The indicator of answer criteria

Answer Criteria	Score	
	Positive	Negative
Very Good	4	1
Good	3	2
Less	2	3
Very Poor	1	4

3. Results and Discussion

3.1 Results

This independent passing training tool product is a digital-based media. The research was conducted by observing the field to find potential and existing problems, looking for books as a development reference and looking for project partners who are experts in the field of engineering to make media designs, determine materials and electronic components and as contractors or implementers of tool making. The following is a product description of passing training aids to train short passing accuracy in soccer.

On August 02, 2019 researchers brought the media to be validated by material experts. The material expert who became a validator was a soccer lecturer at the Faculty of Sports Science at Yogyakarta State University.

Table 3: Validation of media

No	Aspects	Obtained Max Score	Max Score	Percentage (%)	Category
1	Physical	31	36	86,1	Good Enough / Feasible Enough
2	Usage	14	16	87,5	Good / Feasible
Total Score		43	52	86,2	Good / Feasible

On August 03, 2019 researchers brought the media to be validated by media experts. The material expert who became a validator was another soccer lecturers at the Faculty of Sports Science at Yogyakarta State University.

Yogyakarta State University on August 20, 2019. The students were very enthusiastic and interested. This small group trial involved 10 students as respondents.

football from a physical perspective is in the "good/feasible" category, in terms of design is in the "good/feasible" category, while in terms of use is in the "good/feasible"

category, so that the total assessment of the feasibility trial of developing individual passing media to train digital-based short passing accuracy in football according to students of Sports Coaching Education (PKO) A 2015 is categorized as satisfactory. Thus, the development of the media has been completed for small group trials and is feasible to the next stage.

Table 6: The results of individual passing media in large group trial

No.	Aspects	Obtained Max Score	Max Score	Percentage (%)	Category
1.	Physical	888	1.080	82	Good / Feasible
2.	Design	384	480	80	Good / Feasible
3.	Usage	408	480	85	Good / Feasible
Total score		1.680	2.040	82,3	Good / Feasible

The results of the large group trial of Sports Coaching Education students in the 2015 class of football, Faculty of Sports Science, Yogyakarta State University on September 06, 2019 obtained the results of the physical aspect of 82% in the "Good / Feasible" category, the design aspect of 80% in the "Good / Feasible" category, the use aspect of 85% in the "Good / Feasible" category. So that the total assessment of the feasibility of developing individual passing media for science-based digital-based short passing accuracy according to student respondents is 82.3% categorized as "Good / Feasible".

This product was developed through the collaboration of researchers and experts in the field of science and technology alumnus of the Faculty of Engineering, Yogyakarta State University. The work on the product begins with a description of the media performance then continues with the selection of electronic components. The last stage is media testing to assess where the shortcomings are and ensure the media is ready for use.

After the product is finished, the product undergoes expert validation from material experts and media experts. Material expert validation showed a result of 85.2% which means good/acceptable. After material expert validation, this media underwent media expert validation which showed an assessment result of 85.9% which means good/feasible. At the time of media expert validation, researchers received suggestions to add a timer to the programming box that functions as a marker of training time and calculation of the number of passes. Material experts provide product revisions to add scoring to the bouncing board with the aim that players find it easier to determine the passing target, thus leaving players to choose the highest score which means familiarizing players with the accuracy of their short passing. The more often the target is right, the better the accuracy will be when playing in the field. After the media was revised, the assessment by the media expert became good/acceptable.

The trial on this media was carried out in two stages, namely small group trials and large group trials. In the small group trial, this media received an assessment of 80.6%, which means it is in the good/acceptable category. After the small group trial was completed, then proceed to the large group trial. At the time of the large group trial this media got 82.3% of the results which were in the good/appropriate category.

3.2 Discussion

In a research journal of Indonesian sports science media by [7], it is stated that kicking the ball technique is the basis in playing soccer, because a good team is if all players master the technique of kicking the ball well. Kicking is the most important part, a soccer player who cannot kick the ball well

3.1.2 Large Group Trial: The large group trial was conducted at Yogyakarta State University to 30 students of Sports Coaching Education football class 2015, Faculty of Sports Science, Yogyakarta State University on September 06, 2019. The trial was conducted indoors. The trial was carried out from the stage of how to use and then continued with the material content of the media.

is unlikely to be a good player. This is because almost every team always wins (scores goals) because of the kick. According to [8], kicking the ball aims to (1) give the ball to a friend or pass the ball, (2) to put the ball into the opponent's goal or score a goal, (3) to bring the ball back to life after a violation such as a free kick, corner kick, penalty kick and so on, and (4) to do clearing or cleaning by sweeping away dangerous balls in their own area or in an effort to stem the opponent's attack on their own defense area.

In the sport of soccer, passing is a basic technical component that is very important in soccer. Passing is used to feed and score goals. The quality of passing will greatly affect the quality of the game of soccer. Given that soccer is a team sport, all players in it are required to have good basic passing technique skills as well. Passing is best done using the feet, but other body parts can also be used [9].

The role of passing in a soccer game is to pass the ball, block the ball, and not infrequently passing is also used to put the ball into the goal [9]. Based on the data, after conducting small group and large group trials, this individual passing media to train digital-based short passing accuracy has several advantages and disadvantages. The advantages are that individual passing media can count the number of passes every one minute and multiples and the bounce board on the media has a score and target, making it easier to determine the direction of the passing target. Meanwhile, the disadvantages are that the passing score calculation is still manual and the programming box cannot be exposed to rain.

From the results and findings above, it can be seen that the development of digital-based individual passing media to train football short passing accuracy is produced as a training aid for coaches and football players in training short passing accuracy. According to [10], accuracy is a person's ability to direct something in accordance with the desired target.

4. Conclusions

Product production begins with conducting a preliminary study followed by product manufacturing, validation of media experts and material experts, revision of media experts and material experts, small group trials, small trial revisions, product revisions, large group trials, product revisions, and final products. Individual passing media for digital-based short passing accuracy training in soccer is a media consisting of a media frame, bounce board, programming box, ball, kun.

The results of individual passing media products for digital-based short passing accuracy training in soccer, obtained a conclusion that is Good / Feasible to use. This is based on assessments and revisions from media experts, material experts and trial respondents. Overall, the quality of this tool as a media for short passing accuracy training in football is

generally categorized as Good/Feasible, in terms of physical aspects, design and use. This media was declared Good/Feasible through several revisions and improvements until it was declared feasible to be tested by material experts and media experts. The level of feasibility based on material experts of 86.2% is in the Good/Fair category and from media experts of 85.9% is in the Good/Fair category. Based on the small group trial, the test data obtained from the trial results of 80.6% fell into the Good / Appropriate category and the large group trial of 82.3 fell into the Good / Appropriate category and the large group trial of 82.3.

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