

## Multimedia Development of Android-based Referee Signals Recognition Application in Basketball Game for Beginner Players

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### Abstract

Understanding given through verbal and demonstration will be clearer if it is strengthened with developed multimedia. The use of media as a learning resource in basketball is very important, which provides opportunities for trainees or basketball extracurricular beginners to be actively involved directly through the developed media. The product development procedure includes analysis of the product to be developed, developing initial product, expert validation and revision, small group trial and revision, large group trial and final product. Data collection is carried out using questionnaires obtained from expert evaluations, and using field observations obtained from basketball training participants. Data analysis technique uses descriptive statistical analysis. The results of small group trial research that has been carried out, the categories obtained are "very good" with a mean score of 4.51 and large group trial with the category of "very good" with a mean score of 4.30, and this "Very good" percentage reaches 70%. In conclusion, the multimedia development product of Android-based referee signals recognition application in basketball game can be used by beginner players (players who have just learned/played basketball games) independently to get to know more about the rules of basketball game, especially the basketball game referee signals.

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## INTRODUCTION

Sports activities in human activities are very important because sports can form humans who are physically and mentally healthy and have personality traits of discipline, and sportsmanship which ultimately form quality human beings.

Basketball lately are so fast developing and attracting a lot of attention in human life, especially teenagers. This sport is generally played in a closed room. Unlike what happens at school or in public places where basketball is more often played in open spaces. According to Amprulah, Rustiadi & Raharjo (2012), basketball is a sport that is much loved by teenagers, through this basketball activity teenagers get a lot of benefits especially in terms of good physical, mental and social growth. According to the Ministry of Education and Culture (Kemendikbud, 2015), basketball is classified as a team game using large ball. The game is performed on one field between two opposing teams. The aim of each team is to add as many balls as possible to the opponent's basket, so that the attack and defense process is always alternating.

The basketball game itself every time there is definitely a development in any aspects, including the rules of play. The rules of basketball game always have changes every two years published by Federation International Basketball (FIBA) after that translated by Game Rules (PP) of the Indonesian Basketball Association (PERBASI) which is the parent organization that houses basketball in Indonesia. The changes to these regulations are to improve the existing regulations, in addition the rules of basketball govern the ethics of basketball players.

The basketball game itself has a lot of rules and in each violation there is a different signal from the referee. Violation signals from the referee are important to learn for the beginners as a way to smoothen and facilitate the basketball game.

According to Andri & Yanto (2012), there are several learning resources that can be used to introduce the rules of referee signals in basketball, including: picture cards, audio-visual media,

pocket books, and videos adjusted to the player characters who will learn and practice the basketball games.

Along with the technology development in every member of society today, all aspects of life are required to be able to use or utilize technology, no exception in the media utilization in education and sport fields. The more media utilization uses technology, the more media choices that can be used as a means of learning and practicing sports. One of them is the use of using mobile phones via the Android application.

The understanding given through oral or demonstration will be clearer if it is strengthened with developed multimedia in the form of Android application multimedia. According to Adi, Soenyoto, & Sulaiman (2018), with the multimedia presence it is expected that the understanding process can be achieved easily and attractively.

Understanding the referee signals in basketball games using Android-based application will become more interactive with the application of principles in terms of participation of beginner players or athletes, feedback, and strengthening the understanding of the introduction of basketball referee signals. Android-based referee signals recognition application multimedia in basketball game is also called interactive media. Interactive media is a very complex medium combining several media elements involving text, graphics, images, photos, audio, video and animation (Haryanto, Dwiyogo & Sulistyorini, 2015).

Based on these considerations, the researcher wants to develop an Android-based referee signal recognition application multimedia for beginner players. Android-based referee signal recognition application multimedia is used to make it easier to understand referee signals in basketball games. Android-based referee signal recognition application multimedia in basketball game as information carrier technology can be used for the learning process and understanding the introduction of referee signals in basketball game. This Android system application multimedia can be generalized to be learnt by beginner basketball players or trainers because

the learning resources about referee signal recognition are based on the rules of the Indonesian Basketball Association (PERBASI). The broader knowledge related to the introduction of referee signals in basketball games has positive consequences/impacts in the field.

## METHODS

This research is a research and development or Research and Development (R & D). According to Sugiyono (2008) research development or in English language Research and Development is a research method that produces certain products and examines the effectiveness of the product. Research and Development aims to find new knowledge through "Basic research" or answering specific questions about practical problems through "applied research" that is used to improve educational practices. The product development procedures include analysis of; (1) the products to be developed, (2) developing initial products, (3) expert validation and revision, (4) small group trial and revision, (5) large group trial and final product. Data collection was carried out using questionnaires obtained from evaluation of material experts and media experts, and using the results of field observations obtained from basketball training participants. Data analysis technique uses descriptive statistical analysis.

Field trials were carried out to obtain product responses and revisions, so that the final product will be produced in the form of Android-based referee signal recognition application multimedia in basketball game. Small group trials will be conducted at the basketball team at Theresiana Vocational High School in Semarang and a large scale trial or field trial will be conducted at the Al Azhar 15 High School team in Semarang and Theresiana Vocational High School in Semarang. After a small-scale trial, product analysis and revision were carried out before large-scale trials. After a large scale trial, the next stage is final analysis and final revision so that the final product is ready for use.

This research technique is carried out to collect data used as a basis for determining the

feasibility of products developed by researchers. Data obtained by researchers through trial activities. Trial activities are classified into two, namely quantitative and qualitative data. The qualitative data is in the form of assessments, criticisms and suggestions raised by media experts, material experts and basketball extracurricular participants. Quantitative data analysis techniques in this study use descriptive statistical analysis, which is in the form of very less, less, sufficient, good and very good questions that are converted into quantitative data with a scale of 5 with scoring from 1 to 5. Steps in analyzing data include: collecting rough data, giving scores, the scores obtained are then converted to a score of 5 according to Suharyanto (2017).

**Tabel 1.** Assessment Criteria

Score	Score	Category
$X > 4.21$	5	Very good
$3.40 > 4.21$	4	Good
$2.60 < X \leq 3.40$	3	Good enough
$1.79 < X \leq 2.60$	2	Less
$X \leq 1.79$	1	Very less

Source: Suharyanto (2017)

Next to calculate the percentage using the formula below:

$$P = \frac{f}{N} \times 100\%$$

Description:

f : subject frequency

N: total number

To make decisions using the criteria set by Sudjana as follows:

**Table 2.** Conversion of Assessments Based on Percentage

Percentage	Value	Category
81-100	A	Very good
61-80	B	Good
41-60	C	Good enough
21-40	D	Less
0-20	E	Very less

Source: Sudjana(2009)

## RESULTS AND DISCUSSION

The product produced in this study is Android-based referee signal recognition application multimedia in basketball game called

SRR Basketball. This multimedia contains material about the introduction of referee signals in basketball games intended for beginner players of extracurricular participants in senior high school/vocational high school (SMA/SMK) as a means of learning to recognize basketball game rules. In this application the trainees are invited to move from the menu to another menu, and participants can practice with the practice questions available in the Basketball SRR application.

The product is developed through the identification problem phase and what need actually needs to be displayed in multimedia through observation of the training/basketball extracurricular participants by filling out questionnaires and interviews.

From the stages that have been carried out, the researcher found that the material that needs to be provided in the Basketball SRR application is the introduction of basketball referee signals through the Referee, Rule Card, and Exercise menus. Researcher took extracurricular participants from senior high school and vocational high school basketball as the research subjects. There is a change in the content and appearance of the initial draft as the final product after revision from the experts.

#### Material Expert Validation Test

The result of product validation of Android-based referee signal recognition application multimedia in basketball game by material expert I was the average score given for the quality aspects of material presentation, material content and systematic presentation showed "Very good" with a mean score of 4.62.

The result of product validation of Android-based referee signal recognition application multimedia in basketball game by material expert II was the average score given for the quality aspects of presentation, material content and systematic showed "Very good" with a mean score of 4.47.

The following are tables 4.6 and 4.7 which will explain about improvement suggestions from material experts and revisions that have been carried out.

**Table 3.** Suggestions and Improvements from Material Expert I and The Revisions

Suggestion		Revision
Phase I	Phase II	
The writing of Main Menu is not big enough		It has been enlarged so that readers do not have trouble in reading
	The Questions are less varied	Enter more varied questions

Source: Researcher (2018)

**Table 4.** Suggestions and Improvements from Material Expert II and The Revisions

Suggestion		Revision
Phase I	Phase II	
It should be adapted to the new FIBA regulations		Add the latest regulations from FIBA that have not been listed
	The picture of the error section should be more clarified	Fix the picture

Source: Researcher (2018)

#### Media Expert Validation Test

The result of product validation application of Android-based referee signal recognition application multimedia in basketball game for beginner players by media expert I was the average score given for quality aspect, display aspect, and programming aspect showed "Very good" with a mean score 4.26. Result of product validation of Android-based referee signal recognition application multimedia in basketball game for beginner players by media expert II was the average score given for quality aspect, appearance aspect, and programming aspect showed "Good" with a mean score of 4.14.

**Table 5.** Suggestions and Improvements from Media Experts I and The Revisions

Suggestion		Revision
Phase I	Phase II	
Transition speed in each menu is still slow	The sharpness of image resolution	It has been accelerated according to file size. Replace with a clearer picture
The color accuracy selection in writing		It has been adjusted to the background color

Source: Researcher (2018)

**Table 6.** Suggestions and Improvements from Media Expert II and The Revisions

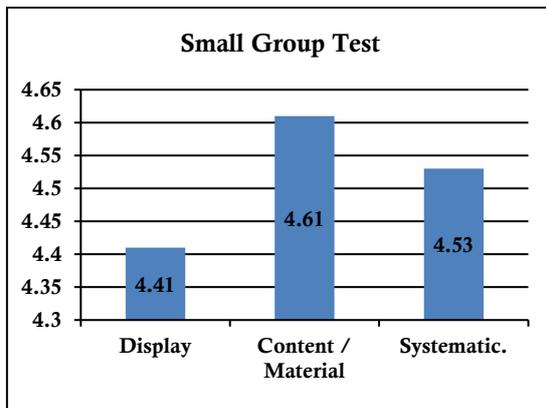
Suggestion		Revision
Phase I	Phase I	
Fill in the Menu section on the Referee menu		Replaced according to the background
	There should be a suggestion menu for application maker	It has been added to the suggestion menu

Source: Researcher (2018)

Based on the data obtained in phase I and phase II of expert validation of Android-based referee signal recognition application multimedia in basketball game developed is declared worthy to use for field trials with revisions as suggested.

### Small Group Test

Small group trials were held at Theresiana Vocational High School in Semarang. The data was obtained through questionnaires in small group trials. Data from small group trial results seen from the overall aspects showed that the results of the small group trial data showed "Very good" with a mean score of 4.51. Following is the diagram of Small group Trial results viewed from 3 aspects,



**Figure 1.** Development Quality in Small Scale Trials

Suggestions and improvements after a small scale trial.

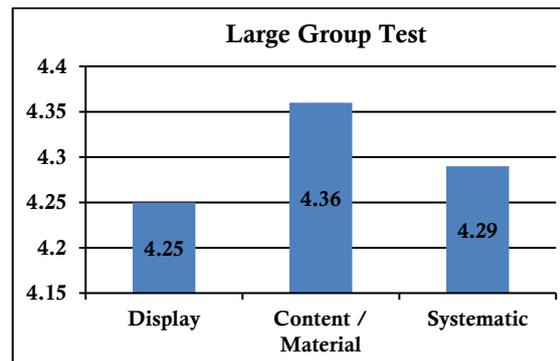
**Table 7.** Suggestions and Improvements after Small Group Trials

Suggestion	Revision
The video is less large	The videos can be enlarged with Full screen
The video is too fast	Given the effect of Slow motion Video

Source: Researcher (2018)

### Large Group Test

Large group trials were carried out by basketball extracurricular training participants in Senior High School (SMA) and Vocational High Schools (SMK) totaling 60 people. The purpose of the large group trial was to find out and identify the advantages and disadvantages that exist in the product of Android-based referee signal recognition application multimedia in basketball game. The results of the large group trial data showed "Very good" with a mean score of 4.30.



**Figure 2.** Quality of Development in Large Group Trials

The distribution of the overall assessment frequency from the aspect of display, content/material, and systematic of the application in the table below shows that Android-based referee signal recognition application multimedia in basketball game in large groups showing more clearly that the assessment results obtained from large group trial data against multimedia development of Android-based referee signal recognition application in basketball game that is developed. Judging from the overall aspects of display, content/material and systematic application of Android-based referee signal recognition application multimedia in basketball game, it

includes in the criteria of "Very good" as much as 68% and in the criteria of "Good" as much as 32%.

**Table 8.** Frequency Distribution of All Aspects of Large Group Trials

Criteria	Frequency	Percentage (%)
Good	18	30
Good enough	0	0
Less	0	0
Very less	0	0
Total	60	100

Source: Researcher (2018)

Based on the research steps that have been carried out, the final product is obtained in the form of Android-based referee signal recognition application multimedia in basketball game, which is in accordance with the characteristics of the beginner players. The success indicators of this product are: (1) the assessment of basketball training participants from small group shows that Android-based referee signal recognition application multimedia in basketball game for beginner players has "Very good" quality, with an overall average of 4.51; and (2) the assessment of basketball training participants from large group showed that Android-based referee signal recognition application multimedia in basketball game for beginner players has "Very good" quality with an overall average of 4.30.

From the description above, it can be concluded that Android-based referee signal recognition application multimedia in basketball game based on small group and large group trials showing the quality of Android-based referee signal recognition application multimedia in basketball game that is "Very good" and accepted.

## CONCLUSION

Based on the results of the research and discussion on the product development of Android-based referee signal recognition application multimedia in basketball game for beginner players, it can be concluded as follows: An Android-based referee signal recognition application multimedia in basketball game for beginner players has been produced as a source of learning to understand the referee signals in

basketball games that have been adapted to the characteristics of the beginners. The product development of Android-based referee signal recognition application multimedia in basketball game is effective as a process to understand the rules of basketball referee signals for beginner players through several stages and revisions according to the validity assessment of basketball material experts and media experts, and then continued with data of small group and large group trials in the form of application display, application content/material, and systematic application aspects showing that Android-based referee signal recognition application multimedia in basketball game for beginner players from large group trials having Excellent quality.

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