



Effectiveness of App-Based Basketball Scorers for Basketball Games

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Abstract

This study aims to find out how effective the success of application-based basketball scorers is in recapturing all events, both personal foul violations, foul teams, score / points etc., according to the FIBA scorer fortfolio in the FIBA match rulebook. The research method used is an experimental method by looking at the differences in the results of the actual scorer records with the results of application-based scorer records. The sample in this study is a student of the Faculty of Sports, Medan State University who took a course in basketball game management. From the results of the research data obtained for personal foul data obtained the value of r Q1 (Quarter round)= 0.9656, Q2= 0.7281, Q3= 0.8668 and Q4= 0.8150, for the foul team data obtained the value of r Q1= 0.9656, Q2= 0.7281, Q3= 0.8668 and Q4= 0.8150, for the data of point 1 score obtained r value Q1= 0.9161, Q2= 0.8989, Q3= 0.9444 and Q4= 0.9048. For the time out data carried out by each team, the values of r Q1 = 1, Q2 = 1, Q3 = 1 and Q4 = 1 from the results of the reliability test, it can be concluded that the scorer application for basketball games can be used to replace the manual scorer that has been used and the level of efficiency is also very high judging from the reliability test category which ranges from strong to very strong.



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INTRODUCTION

The game of basketball is a game sport that has a very tight match schedule. Contested by two teams, with five-on-five matches, with 4 quarters trying to score as many points as possible (FIBA, 2018). Basketball games are a type of sport that uses a large ball, is played by hand and has the aim of inserting as many balls as possible (into the opponent's basket), as well as restraining the opponent from putting the ball in his own basket by throwing catch (passing), dribble and shooting (shooting) (Sumiyarsono, 2002).

The game of basketball is one of the sports activities that has a positive effect on the learner in the physical, mental and social side because it is gaining widespread attention locally and globally, it has regard to various concepts and basic skills as the basis of the requirements for learning (Ahmed, 2012). From the theory above, it can be understood that basketball has a high intensity of play, a lot of movement and a lot of body contact with opposing players so that it has the possibility of fouls in matches. Basketball games have 3 points division based on shooting range and difficulty level when shooting the ball, starting from the smallest with point 1, namely free throw, free throw in basketball as it is known at this time is a fast, dynamic sport played by athletes who must have a total fitness package in order to play at the highest level and have good free throw techniques. (Burns & Dunning, 2010).

In a basketball game a player has the potential to score points according to his distance from the basketball hoop, the closer to the basketball hoop, the greater your chances of making a shot. (Oliver, 2009). Because of this, the opposing player will try to keep away from the ring

area even though they have to commit a foul.

Analysis of basketball matches can be collected from various sides, one of which is the result of the game. In lectures conducted by PJKR FIK students, Medan State University, one of the competencies that must be possessed by students is how to fill in the basketball scorerset listed in the FIBA rulebook. In addition to leading the match, students must also be able to fill in the basketball scorerset as one of the competencies that must be possessed. The analysis of the occurrence of violations and errors can be known from the decision of the referee, there is an opinion from an expert, namely In basketball there are two types of violations, the name Violation which is usually symbolized by the referee with open arms, the second is commonly called Foul and the referee usually symbolizes it with his hands clasped up (Saichudin, 2019).

This study aims to determine the effectiveness of the scorerset application designed in accordance with the portfolio of manual scorersets in the FIBA match regulations. The media design of the android-based scorerset application contains information about the name of the team, the time of the match, the list of names and player numbers, the number of personal fouls, the team foul in each quarter, personal and team points, time outs on each team and records of the time of completion of the match. Research conducted by Jaime Sampaio, explains the usefulness of the technology used to track and evaluate the performance of new players both in attack and defense, displaying the results of player performance by describing the value of the player's work results. (Sampaio, 2015). This research explains that technology can be used as a tool for evaluating the performance of basketball players in undergoing matches. The form

of teaching in universities has also begun to be reformed using the help of technology, namely the smartphone. The development trend of the reform of college basketball teaching is clear, which provides reference for basketball teaching reform of the person (Wen, 2019). Meanwhile, according to Miarso, technology is a form of process that increases added value. The running process can use or produce certain products, where the products produced are not separate from other existing products. (Miarso, 2007). According to this opinion, it can be concluded that the application technology on Android used has been refined from the existing scoresheet so of course this can add to the use value of a technology.

The referee's performance in the match greatly affects the outcome of the record of events contained in the scorerset of the basketball. Events such as violations and policy making by the referee, largely determine the course of the game. Research conducted by Anthony using a Playerload application explains the submission of requests for players, coaches and referees in each match, so that the usefulness of the evaluation is aimed at running the next match better (Anthony, 2019).

METHODS

In this study, the author used a research method that matches the purpose of this study, the research method used in this study is a field experiment, using tests and measurements. Experimental research methods are research methods used to find the influence of certain treatments on others under controlled conditions (Sugiyono, 2018). Measurement is the process of collecting data or information from a certain object, in the process of measuring a measuring instrument is needed. This measuring instrument can be

in the form of questions, psychomotor tests, attitude scales and in the form of standard measuring instruments such as meter size, weight, temperature measure (Nurhasan, 2007)

The data collection used in this study was by using tests. The test used is by comparing the results of the scorer analysis used by students with the actual data on the events in the match, so that researchers can see the effectiveness of the accuracy of the application to be used as a substitute for a manual scorerset.

The research data obtained was in the form of personal foul data, for the Q1 (Quarter 1), Q2 (Quarter 2) Q3 (Quarter 3) and Q4 (Quarter 4) foul team data for point 1, Point 2, and point 3 score data, and time out in Q1, Q2, Q3, and Q4. Furthermore, each measurement result will be calculated using a product moment reliability test.

To calculate reliability, a product moment correlation formula is used by correlating the test results (test retest). The product moment formula is as follows (Azwar, 2017):

$$r_{xy} = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{\{(N \sum x^2) - (\sum x)^2\} \{(N \sum y^2) - (\sum y)^2\}}}$$

Information:

r_{xy}	= Overall reliability of the tool
x	= score on variable X
y	= score on variable Y
$\sum x$	= number of variable scores X
$\sum y$	= number of variable scores Y
$\sum x^2$	= sum of the squares of the score X
$\sum y^2$	= sum of the squares of the Y score
xy	= X score multiplied by Y
N	= number of subjects

The product moment correlation coefficient between the two score distributions in the table III.1 example is $r=0.707$ which is the reliability coefficient of the test in question. The reliability coefficient can be considered as an indicator of the stability of measurements made by the test over time (stability over time) (Azwar, 2017).

The correlation level criteria can be seen in the guideline table below which is used to provide interpretation of the correlation coefficient according to Sugiyono.

Table 1. Correlation Coefficient Level

Coefficient Interval	Relationship Level
0,00 – 0,199	Very low
0,20 – 0,399	Low
0,40 – 0,599	Keep
0,60 – 0,799	Strong
0,80 – 1,000	Very Powerful

If the relationship between the measurement test on the application and the measurement test with a manual scoreset has a high level of correlation coefficient in the strong or very strong category with a coefficient interval between 0.60 to 1.00 then the results show that the use of the scoreset application in basketball games can be trusted and has a high level of accuracy.

Participants

The sample in this study was a student of the Faculty of Sports, Medan State University who took a course in basketball game management. The number of samples was 17 people, who came from novice basketball players, namely students aged 17 to 19 years. gender consists of 10 males and 7 females.

Sampling Procedures

The sampling technique used in this study was purposive sampling. Purposive sampling technique is sampling using certain considerations according to the desired criteria to be able to determine the number of samples to be studied, (Sugiyono, 2016). The sample used was determined based on the criteria of the level of proficiency in playing or novice players, aged 17-19 years, taking

basketball game management courses, coming from the male and female genders.

RESULT

The application uses a cellphone as a medium or can be called a mobile app. The view of the scorer application is as follows.

Figure 1. App View

Figure 2. FIBA Manual Scoresheet Display 2022.

From the results of the study, personal foul data were found and the correlation between using the scorer application and the manual scorer. The results of the reliability test (r) are as follows.

Table 2. Results of The Calculation of Personal Data Reliability Foul

Quarter	r_{xy}	Relationship Level
1	0.9656	Very Powerful
2	0.7281	Strong
3	0.8668	Very Powerful
4	0.8150	Very Powerful

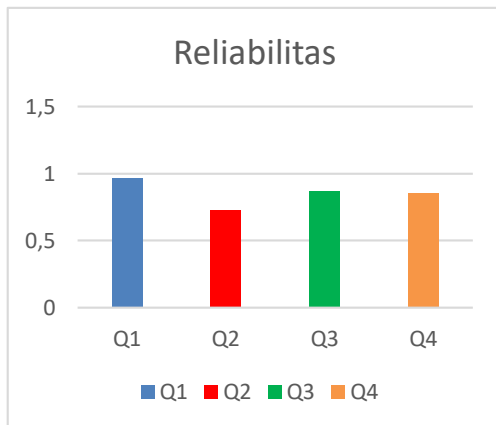


Figure 3. Graphic Personal Foul

From the results of the study, foul team data was found and the correlation between using the scorer application and the manual scorer. The results of the reliability test (r) are as follows.

Table 3. Foul Team Data Reliability Calculation Results

Quarter	r_{xy}	Relationship Level
1	0.8550	Very Powerful
2	0.8712	Very Powerful
3	0.8379	Very Powerful
4	0.9222	Very Powerful

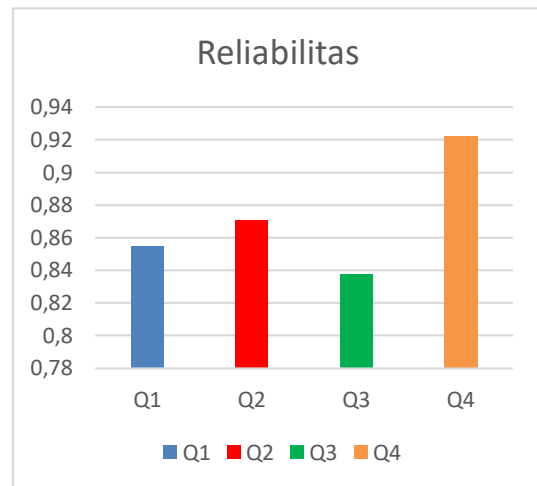


Figure 4. Graphic Team Foul

From the results of the study, it was found that point 1 data and the correlation between using the scorer application and the manual scorer. The results of the reliability test (r) are as follows.

Table 4. Data Reliability Calculation Result Point 1

Quarter	r_{xy}	Relationship Level
1	0.9161	Very Powerful
2	0.8989	Very Powerful
3	0.9444	Very Powerful
4	0.9048	Very Powerful

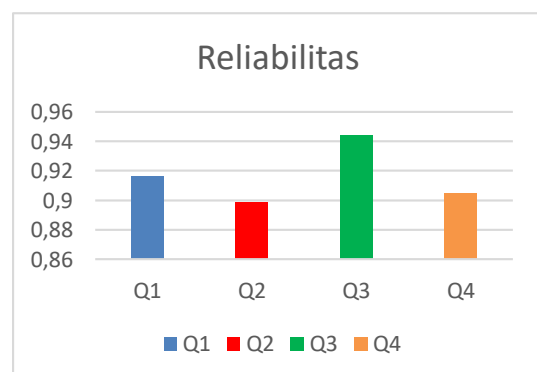


Figure 5. Graphic Poin 1

From the results of the study, point 2 data was found and the correlation between using the scorer application and the scorer manual. The results of the reliability test (r) are as follows.

Table 5. Data Reliability Calculation Result Point 2

Quarter	r_{xy}	Relationship Level
1	0.9283	Very Powerful
2	0.8805	Very Powerful
3	0.8967	Very Powerful
4	0.9176	Very Powerful

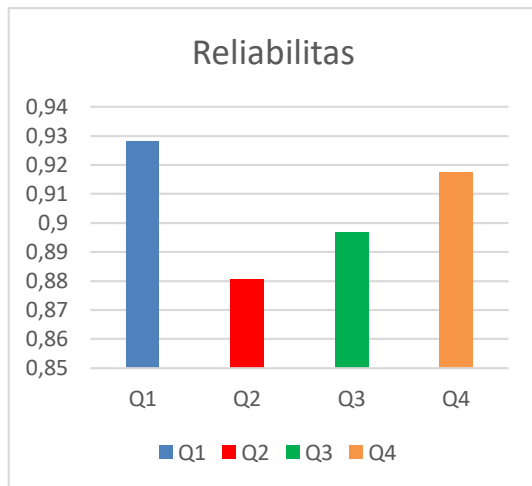


Figure 6. Graphic Point 2

From the results of the study, point 3 data was found and the correlation between using the scorer application and the manual scorer. The results of the reliability test (r) are as follows.

Table 6. Data Reliability Calculation Result Point 3

Quarter	r_{xy}	Relationship Level
1	0.8265	Very Powerful
2	0.9550	Very Powerful
3	0.9198	Very Powerful
4	0.8890	Very Powerful

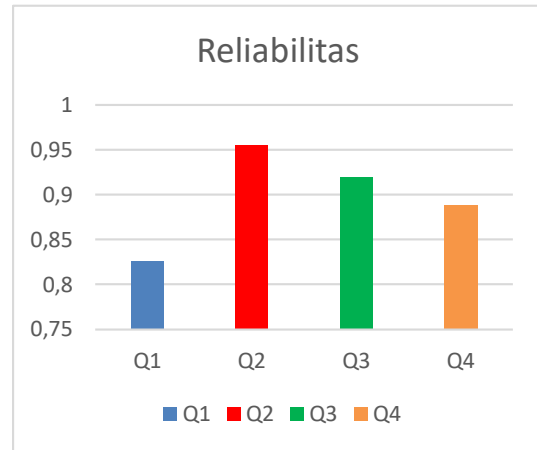


Figure 7. Graphic Poin 3

From the results of the study, time out data was found and the correlation between using the scorer application and the manual scorer. The results of the reliability test (r) are as follows.

Table 7. Data TimeOut Reliability Calculation Results

Quarter	r_{xy}	Relationship Level
1	1	Very Powerful
2	1	Very Powerful
3	1	Very Powerful
4	1	Very Powerful

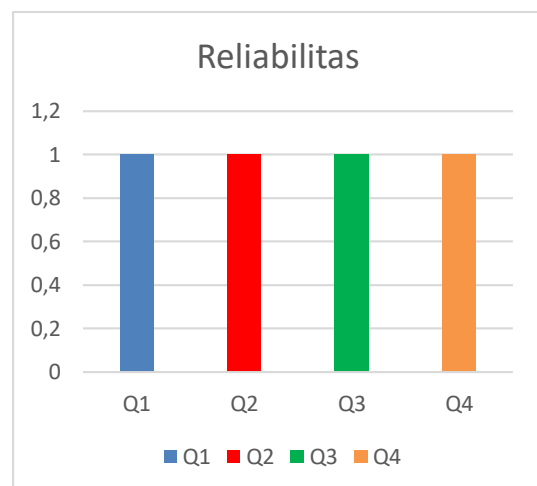


Figure 8. Graphic Time Out

DISCUSSION

The change in time affects everyone's perspective on doing everything, including in this game of basketball. The vision of the game of basketball that must be transparent and must be linked to technology is very suitable with the existence of existing scoreset applications and has proven its effectiveness as conveyed by Altavilla, namely the need for a major tactical technical paradigm to be applied to the new vision of basketball (Altavilla, 2014).

CONCLUSION

The results of the analysis data above, it can be concluded that the efficiency of using the scorer application for basketball games is very good, as can be seen from the reliability test which describes the level of relationship between the scoring test that uses the application and the manual. For each part that can be counted starting from the personal foul, team foul, point 1, point 2, point 3 and time out, everything is calculated in each quarter of the round and the results of a strong to very strong reliability relationship are obtained. The conclusion of such results is that the application can be used in place of manual scorers in basketball games.

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