Improving the performance of football assistant referee through video-based training

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Abstract. This study aims to determine the effect of video-based training to improve the performance of football assistant referee. This study used an experimental method, involving 54 assistant referees who were divided into experimental and control groups. The result shows that the application of video-based training improved the performance of assistant referees. The assistant referees were able to analyze the various mistakes made every time they led a football match. It implies that variation in the training process using video technology is necessary to enhance the performance of football assistant referee.

1. Introduction

The role of referees is very important in football matches, especially in professional football. The wrong decision might have a profound influence on the outcome of the match [1]. The referee is in charge of leading the football match in accordance with the rules of the game of football, assisted by two assistant referees and fourth official [2]. The presence of the referee on the field becomes a determinant of whether or not a match will run smoothly. The referee has the responsibility to control the player's behavior during a football match and apply the rules of the game [3]. The referee in collaboration with two assistant referees has full authority to control and regulate the behavior of players and coaches [4]. There is no doubt that the referees' contribution to the game of football is very important. They enforce the law of the game and punish violations of these rules. All sorts of judgments may affect the outcome of the match, which is why the referee's decision should be as accurate as possible.

The role of the assistant referee in a football match is no less important than the role of the referee. Just like the referees, the assistant referees must also maintain concentration and make decisions quickly from each incident to help the referee’s performance. In many circumstances, the referee chooses to consult with one of the two referees' assistants (line judge) to make a decision [3]. In one match an assistant referee can cover a distance of 7.28 km [5]. This shows that the assistant referee must also have good physical condition in order to concentrate during the match. If the assistant referee is able to concentrate well throughout the match, it is hoped he can also make the right decision in each incident. But the tension of the match, the temperature of the location of the match will affect the level of fatigue experienced by the assistant referee, which of course will affect his performance. A repetitive 30m sprint will have a fatigue effect, the peak distance to the offside line will be greater in the second half than in the first half, reflecting a decrease in the ability of the assistant referees to compensate for the game [6].

Besides physical factors, there are many other factors that can affect the performance of the assistant referee from the pressure of the player, official, audience and also understanding the rules of the game.
A good understanding of the rules will help referees and assistant referees to be able to decide on any events that occur in the field quickly and accurately. Better knowledge from football referees can certainly benefit the game [1]. A closer look reveals that referees in football must make around 200 to 250 decisions per match [6]. Likewise, the assistant referees also have to make many decisions to help the referee. The offside decision taken by the assistant referees has an error rate of 25% [7].

The use of media is very important to help achieve the objectives of training or learning. To overcome or reduce the level of errors made by the assistant referee, it is necessary to have a form of training and training media that have the latest innovations. Innovative training methods should be designed to train sports referees to help them develop a higher level of expertise in a shorter period of time [8]. One method that can be used is to use video-based exercises. The use of video in education can improve the ability of students [9]. Training methods using video have been repeatedly shown to improve athlete performance [10]. The visual appearance through video will make it easier for the assistant referees to digest the material provided. With this method the assistant referees can see a variety of situations that might occur in the field and how to make the right decisions. Moreover, the assistant referees with the guidance of their coaches can analyze their performance in the field, so they can judge the accuracy of the decisions they give in the match. They can find out whether the decisions they make in the match are right or wrong. To improve intuitive decisions, feedback about the correctness of decisions is very important [11]. Based on the phenomenon of the problem above, the researcher needs to find out whether there is a significant effect of the video-based training method on improving the performance of the assistant football referees.

2. Methods

The method used in this study was the experimental method, with a pretest-posttest control group design. 54 assistant referees were involved in this study. Before getting the treatment, all the referees did a pretest to show performance in a football match. After that, the referees were divided into two groups which were the group who received the video-based training and the group who received the conventional training (control group). Two sample groups will receive training material using different methods. Video-based training groups will receive training by viewing video matches both done by others and conducted by themselves. Then in each meeting they will analyze every decision given by the assistant referee, they witnessed in the video, they also get feedback from experts on what they have decided in the match. While the control group will receive training in the field of positions and decisions.

Sample participants will get treatment for 8 exercises. The duration of training at each meeting can last from one to two hours depending on the training material provided at that time. After 8 meetings a posttest was held to display the performance of the assistant referee when leading a football match. The instrument to measure the performance of football assistant referees is to use the assessment form of assistant referees from the FIFA conducted by referee assessors who have a license. All performance assessments of assistant referees judges are carried out at football matches in a football tournament in Bandung. After the data is obtained, a statistical data analysis will be carried out to determine the effect of the video-based training on improving the performance of soccer assistant referees.

3. Result and Discussion

In table 1 shows that, the calculated F value is 38.250 with a significance level of 0.000 <0.05 then the regression value can be used to predict the participation variable or in other words there is the effect of the video-based exercise variable on the referee’s performance outcome variable. Furthermore, to find out how much influence the results of variable X on variable Y can be seen in Table 2 illustrated that the results obtained by the coefficient of determination (R Square) of 0.605 which explains the understanding that the effect of the independent variable (video-based training) on the dependent variable (Referee performance) is by 60.5%.
Table 1. Linear regression test results in video-based training group

| Model          | Sum of Squares | df  | Mean Square  | F     | Sig. |
|----------------|----------------|-----|--------------|-------|------|
| Regression     | 1.948          | 1   | 1.948        | 38.250| .000a|
| Residual       | 1.273          | 25  | .051         |       |      |
| Total          | 3.221          | 26  |              |       |      |

Tabel 2. Determination coefficient test results in video-based training group

| Model | R  | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|----|----------|-------------------|---------------------------|
| 1     | .77 | .605     | .589              | .226                      |

Furthermore, the control group as in table 3 is useful as a comparison to strengthen the results of the independent variables that influence the dependent variable. In the control group there are significant results from the training given to improve the performance of assistant football referees with a significance value of 0.000. If you look at the R Square data Table 4 shows that the control group has a value of 0.572, the results of the data are smaller than the results of R Square in the video-based training group. This gives meaning that video-based training has a greater increase in the performance results of football referee assistants.

Table 3. Linear regression test results in control group

| Model          | Sum of Squares | df  | Mean Square  | F     | Sig. |
|----------------|----------------|-----|--------------|-------|------|
| Regression     | 4.573          | 1   | 4.573        | 34.700| .000a|
| Residual       | 3.427          | 26  | .132         |       |      |
| Total          | 8.000          | 27  |              |       |      |

Table 4. Determination coefficient test results in control group

| Model | R   | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-----|----------|-------------------|---------------------------|
| 1     | .756a| .572     | .555              | .363                      |

From the research data obtained, it shows that the process of video-based training on football assistant referees has an influence on improving the performance of assistant referees in matches. These results are consistent with a predetermined hypothesis that video-based training has a significant effect on improving the performance of assistant referees in leading matches. The use of video in the training process makes it easy for the assistant referee to understand the training material provided. The use of audiovisual media (video) in the teaching process achieves higher effectiveness [12]. The use of media in training or learning is very important as a tool to stimulate student or athlete learning. In this study, assistant referees can carry out instructions in training material well. This is because with the help of audiovisual media students receive training material through hearing and also in the form of visualization [13]. By adding audiovisual media (video) in the process of learning or training can improve learning outcomes (exercises) passing and shooting in futsal sports [14]. In contrast to the control group that receives more material through audio media only. The use of audio media in the learning process will take longer to complete assignments than students who use multimedia [15].
In the implementation of the training process, the number of trainers as mentors in the training process is very limited, so the process of providing feedback to assistant referees is less than optimal. The results of the study may be different if the training process is given to an assistant referee who has different experience or license. This is because the ability of the referee to develop specific roles is very dependent on the experience he has [8].

4. Conclusion
We explore the impact of using video in the training process for referee assistants. The use of video in the training process has improved the performance of football assistant referees. We found that giving feedback during the video-based training process made a positive contribution to helping achieve the objectives of the training given to the football assistant referees. The improvement shown from video-based exercises is greater compared to conventional exercises without using technological assistance. Therefore in the process of education or training, the use of technological aids will make the training or teaching process more effective and can maximize the results to be obtained.

5. References
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