Effectiveness of a Technical Educational Program and its Effects on Improving Referee Skills for Soccer Referees (Third Grade)

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Abstract:

The current research aims to design a technical educational program for improving referee performance skills for third-grade soccer referees and to use it in identifying the referee performance skills among third-grade soccer referees in the Egyptian league and the effectiveness of the designed program. The researcher used the quasi-experimental approach (one-group design) with pre- and post-measurements. The research community includes all third-grade soccer referees registered in the Egyptian Federation of Football 2023-2024. Maim's research group (n=25) was randomly chosen. Results indicated that the technical educational program had positive effects on learning some performance skills for third-grade soccer referees. The observation card had a high ability to judge referee performance skills for third-grade soccer referees.

Keywords: Educational Program – Referee Skills – Football – Referee

Introduction and Research Problem:

Science and knowledge have the power to change history. Therefore, educational technology must be a core component of the educational process so that education transfers from memorization and dictation to practice and experimentation. This makes learning possible while the teacher is absent as it depends on the learner himself who uses specially designed educational media like programmed books, educational tv, educational computer, and websites. During motor skills learning, the learner can be modified through these media that create a new environment that depends on knowledge resources and modern methods that help learners reach their learning by themselves **(Abu Harga et al 2001, p 15 – p 24)**. A human being can remember 20% of what he hears and 40% of what he sees and hears. This percentage may reach 70% for what he hears, sees, and does. It may even increase in the case of interaction with learning through these modern media **(Tomlinson 2011, P 30)**.

Soccer is a sport with various playing situations that occur repeatedly but not with the same pattern. This requires the referee to have physical, motor, and technical abilities that enable him to make correct decisions in a short time for each of these situations and this signifies the major importance of these abilities to make such decisions **(Shokr 2009)**. It is clear that requirements of refereeing sports activities in general, and soccer in specific, are different from the requirements of refereeing other activities as specific skills may differ from one referee to another according to the nature and intensity of the competition, audiences, number of players inside the court, applied rules and regulations and contact among players as all these factors increase the degree of difficulty **(Zina 2006, P 5)**. Refereeing is a special set of important issues as it is a practical method for the procedures that facilitate the referee's mission on the court

and help him to assume the best positions for making decisions concerning violation of game rules so that these decisions should be correctly leading the referee to lead the match successfully **(Ibrahim 1994, p 450)**.

One study indicated that using multi-media technology for soccer referees may help them use more than one of their senses to maintain the learning effect in those learners **(Abdallah 2010)**. Other studies indicated that elite levels of refereeing have a unique nature that requires continuous and specific training for physical fitness **(Piggott et al 2015, Bradley et al 2014, Helsen & Bultynck 2004, D'OTTAVIO 2001)**. Another study indicated a directly proportional correlation between mental abilities and decision-making among soccer referees **(Al-Banna 2015)**.

The researcher thinks that obstacles that may face soccer referees and affect their performance are represented in the increase of media pressure due to inadvertent mistakes and limitations of some personal qualities of the referee that include low levels of physical fitness that prevent the referee from being close to the event to judge it correctly. In addition, over-enthusiasm and increased levels of sensitivity in matches may affect the referee's performance. Furthermore, the excessive use of VAR technology affected the referees' performance greatly. All these factors had negative effects on the performance level of soccer referees as it disturbs the decision-making process in time. As an international referee and through continuous reading about new amendments of rules and regulations in addition to noticing closely the performance of third-grade referees at the championships held by the Egyptian Federation of Football, the researcher noticed that all trials for improving soccer concentrate on many aspects like rules and players. But there is a severe lack of research work that deals with third-grade referees, according to the researcher's knowledge. This means that a major aspect, which is the lack of referee performance skills, is neglected. This led the researcher to design a technical educational program for improving referee performance skills for third-grade soccer referees.

Aim:

The current research aims to design a technical educational program for improving referee performance skills for third-grade soccer referees and to use it in:

1. Identifying the referee performance skills among third-grade soccer referees in the Egyptian league.
2. Identifying the effectiveness of the designed program.

Hypothesis:

- There are statistically significant differences on P ≤ 0.05 between the pre-and post-measurements on the observation card of improving referee performance skills for third-grade soccer referees.

Methods:

Approach:

The researcher used the quasi-experimental approach (one-group design) with pre- and post-measurements.

Participants:

The research community includes all third-grade soccer referees registered in the Egyptian Federation of Football 2023-2024. Maim's research group (n=25) was randomly chosen.

Data Collection Tools:

1- Observation Card: This card included the following referee performance skills for soccer referees:

- Validity and reliability of decision-making
- Match control and dealing with mistakes and misconduct (warning and expulsion if necessary)
- Fitness – endurance – speed – acceleration – positioning.

2- The Recommended Technical Program:

All learning needs, program objectives, content to fulfill objectives, educational activities, and suitable means of evaluation were identified clearly through the following steps:

Program Principles:

- Using modern technology in soccer refereeing.
- Keeping up with continuous amendments of soccer rules and regulations.

Identifying Educational Needs:

Through a review of related literature, the main objectives of the program concentrated on providing third-grade soccer referees with performance skills. By the end of the program, t is expected that each participant would be able to:

- Use visual skills effectively.
- Discover mistakes in the presented situations.
- Reach logical conclusions and suitable results.
- Give logical meaning to the nature and characteristics of the subject.
- Set logical steps to solve the presented problem.
- Improve personal qualities during match management.
- Deal with assistant referees
- Control the match and deal with mistakes and misconduct.
- Understand the correct use of cards.
- Distinguish between mistakes that require notifications or warnings.
- Use signs, decisions, and body language.
- Create correct positioning and choose a clear vision angle.

Methods Used in the Educational Program:

The recommended program depended on several methods including:

- Effective lecture through using projectors and computers to present information.
- Discussion and dialogue.
- Practical presentations to apply information and activities in addition to simulating reality through participation in some matches under the supervision of the researcher.

Identifying educational activities:

The program included a variety of activities that the referee can use to improve performance skills.

Validating the program:

The program was presented to a group of specialized experts in the field to gain their opinions about the program's suitability, scientific content, activities, tools, and methods of training. The researcher applied all recommended modifications according to experts' opinions.

Pilot Study:

The researcher performed the pilot study to identify any problems that may arise during application in addition to preparing computers and necessary tools and calculating the observation card's validity and reliability.

Card Correction:

The observation card included (20) questions. Each correct answer takes (1) while each wrong answer takes (0). Results are between (0) and (20) as (20) is the total mark.

Difficulty Coefficient:

It is the percentage of wrong answers for each question. To calculate it, wrong answers and correct answers were counted and then you can apply the following equation (Al-Rabiey 2005, P 79):

Difficulty coefficient = number of wrong answers / (number of correct answers + number of wrong answers).

The distinction coefficient can be calculated as follows:

Distinction coefficient = (number of correct answers in the upper group - number of correct answers in the lower group) / half the number of the group.

The following table shows the difficulty and distinction coefficients:

Table (1): difficulty and distinction coefficients for the observation cars:

Number of questions	Difficulty coefficient	Distinction coefficient	Number of questions	Difficulty coefficient	Distinction coefficient
1	0.72	0.33	11	0.76	0.36
2	0.28	0.60	12	0.36	0.63
3	0.76	0.48	13	0.48	0.38
4	0.76	0.50	14	0.76	0.76
5	0.72	0.42	15	0.20	0.33
6	0.24	0.70	16	0.72	0.68
7	0.72	0.33	17	0.72	0.38
8	0.24	0.36	18	0.36	0.60
9	0.52	0.63	19	0.80	0.50
10	0.60	0.38	20	0.48	0.68

Table (1) indicated that the degree of difficulty ranged from 0.20 to 0.75 with means of 56% while the distinction coefficient ranged from 0.33 to 0.75 with means of 50.1%. this means that all items on the card are at an acceptable level.

Validity and Reliability of the Card:

Judges' Validity was calculated by presenting the card to experts and identifying their opinions.

Internal Consistency was calculated by calculating correlation coefficients between each item and the total degree of the card as seen in Table (2).

Table (2): correlation coefficients between each item and the total degree of the observation card (performance skills test for third-grade soccer referees).

Items number	Correlation coefficient	Items number	Correlation coefficient
1	0.435	11	0.649
2	0.436	12	0.520
3	0.768	13	0.714
4	0.533	14	0.691
5	0.642	15	0.708
6	0.479	16	0.804
7	0.592	17	0.740
8	0.633	18	0.824
9	0.652	19	0.703
10	0.506	20	0.790

Significance on $P \leq 0.05 = 0.3809$

Table (2) shows statistically significant correlations on $P \leq 0.05$. This indicates the internal consistency of the card.

The reliability of the observation card was calculated through the split-half method to calculate correlations between odd and even questions then correcting correlations using the Spearman-Brown equation as seen in table (3).

Table (3): Split-Half Method for verifying Observation Card Reliability.

S	Item	Correlation coefficient	Modified Correlation coefficient
1	The total degree of the card	0.577	0.732

Table (3) indicated that correlations were high and significant. This proves the validity and reliability of the observation card.

Main Study:

Pre-measurements: reliability and validity of the observation card were verified.

Main application: the recommended technical educational program was applied to the experimental group (n=25).

Post-measurements: the observation card was applied to the experimental group (n=25) at the end of the recommended program.

Statistical treatment: The researcher used SPSS software to calculate the mean, SD, correlation coefficient, easiness coefficient, and (t) test.

Results:

Table (4): (t) test for difference significance between pre- and post-measurements of the observation card (n=25)

Qualities	Measurement	Mean	SD (±)	(t) calculated values	(t) potential values	Significance
Personality	Pre-	3.63	0.518	5.421	0.00	Significant
	Post-	3.49	0.516			
Reliability of decision	Pre-	3.41	0.594	11.023	0.00	Significant
	Post-	3.19	0.609			
Match control	Pre-	3.07	0.584	11.817	0.00	Significant
	Post-	2.80	0.611			
Total score	Pre-	3.35	0.549	14.946	0.00	Significant
	Post-	3.13	0.561			

(t) table value on P ≤0.05 = 2.063

Table (4) indicated that all (t) calculated values were higher than its table value for the observation card of referee performance skills of soccer referees.

Table (5): Eta² and Effect Size for the observation card of referee performance skills of soccer referees

Skills	(t) calculated values	Eta²	Effect size	Effect degree
Personality	5.421	0.375	1.549	High
Reliability of decision	11.023	0.713	3.149	High
Match control	11.817	0.740	3.376	High
Total score	14.946	0.820	4.270	High

Table (5) indicates that Eta2 and effect size were high. This proves the effect size of applying the observation card of referee performance skills for soccer referees was high.

Discussion:

Tables (4) and (5) indicated statistically significant differences between pre-and post-measurements on all referee performance skills for soccer referees. For "personality", (t) calculated value (5.421) was higher than its table value (2.063) on P≤0.05. For "reliability of decision", (t) calculated value (11.023) was higher than its table value (2.063) on P≤0.05. For "match control", (t) calculated value (5.421) was higher than its table value (11.817) on P≤0.05. In addition, calculated Eta2 and effect size showed that their values were high indicating that the effect size of the recommended technical educational program for improving referee performance skills of soccer referees was very high.

The researcher thinks that these differences are because the recommended technical educational program considered all qualities that are important for soccer referees while leading soccer matches as referees underwent live experiences during application. This is consistent with the fact that soccer refereeing is a major field of study to improve the game as refereeing is a cornerstone in soccer and all its aspects should be studied **(Shokr 2003)**.

This is also consistent with **(Abdallah 2010)** who identified referee levels objectively in soccer using computer-based observation and indicated that using multi-media technology helps soccer referees to use more than one of their senses and this maintains learning outcomes.

This is also consistent with previous studies that indicated that elite levels of refereeing have a unique nature that requires continuous and specific training for physical fitness **(Nabli et al 2017, Vaquera et al 2017, Piggott et al 2015, Bradley et al 2014, Helsen & Bultynck 2004, D'OTTAVIO 2001, Castagna 2001).** A referee is a person who had all the necessary conditions to pass the technical and physical tests and according to these tests, the concerned body depends on him and categorizes him

according to rules and regulations **(Al-Rabeay 2005)**. Referees should have the ability to keep up with the ball and players' velocities so that they can be close enough to make correct decisions (Muniroglu 2007).

The researcher thinks that the nature of soccer referee performance is closely related to variable playing situations and all his moves are related to the game situations he faces. The recommended technical educational program considered all this by presenting and explaining some variable situations so that third-grade soccer referees can reach a good understanding to make correct decisions.

Conclusions:

According to this research aim, methods, and results, the researcher concluded that:

1. The technical educational program had positive effects on learning some performance skills for third-grade soccer referees.
2. The observation card had a high ability to judge referee performance skills for third-grade soccer referees.

Recommendations:

According to these conclusions, the researcher recommends the following:

1. Generalizing the recommended technical educational program so that it can be used in selecting third-grade soccer referees.
2. Notifying third-grade soccer referees periodically of all recent advances and new rules and skills of soccer refereeing.
3. Performing more studies that deal with referee performance skills.
4. Performing more studies that deal with improving technical, physical, intellectual, and mental aspects of soccer referees.

References:

1. Abdallah, Mohamed E. (2010): Effects of computer-based refereeing situations on the cognitive level of soccer referees. Master dissertation - Faculty of Physical Education for Men – Zagazig University (in Arabic)
2. Abu Harga, M. H.; Zaghloul, M. S. & Abd El-Monem, H.S. (2001): Educational Technology in Physical Education. Markaz Al-Ketab Press – Cairo – Egypt (in Arabic).
3. Al-Banna, Hatem M. (2015): An analytical study of the mental abilities affecting decision-making for soccer referees. Master dissertation. Faculty of Physical Education for Men – Mansoura University (in Arabic).

4. Al-Rabeay, Samir M. (2005): A training curriculum for improving refereeing abilities and its effects on the performance level of soccer referees. Ph.D. dissertation – Baghdad University – Iraq (in Arabic).

5. Bradley, P. S., Bendiksen, M., Dellal, A., Mohr, M., Wilkie, A., Datson, N., ... & Krustrup, P. (2014). The Application of the Yo-Yo Intermittent Endurance Level 2 Test to Elite Female Soccer Populations. Scandinavian journal of medicine & science in sports, 24(1), 43-54.

6. D'OTTAVIO, S. T. E. F. A. N. O., & CASTAGNA, C. (2001). Analysis of match activities in elite soccer referees during actual match play. The Journal of Strength & Conditioning Research, 15(2), 167-171.

7. Helsen, W., & Bultynck, J. B. (2004). Physical and perceptual-cognitive demands of top-class refereeing in association football. Journal of sports sciences, 22(2), 179-189.

8. Ibrahim, Medhat H. (1994): An analytical study of refereeing performance level for referees of the Egyptian Class A League. Master dissertation. Faculty of Physical Education for Men – Alexandria University (in Arabic)

9. Müniroğlu, S. (2007). A research on sprint and vertical jump capabilities of professional football league referees in Turkey. Journal of Sports Science and Medicine, 6(10), 213-215.

10. Nabli, M. A., Abdelkrim, N. B., Castagna, C., Jabri, I., & Batikh, T. (2017). Energy Demands and Metabolic Equivalents (METS) in U-19 Basketball Refereeing During Official Games. Journal Sports Medicine Doping Studies, 7(190), 2161-0673.

11. Piggott, B. G., McGuigan, M. R., & Newton, M. J. (2015). Relationship between physical capacity and match performance in semiprofessional Australian rules football. The Journal of Strength & Conditioning Research, 29(2), 478-482.

12. Shokr, Saber Y. (2009): Improving specific motor abilities of soccer referees and its effects on some functional variables. PhD dissertation - Faculty of Physical Education for Men – Zagazig University (in Arabic)

13. Tomlinson (2011): The learning of motor skills, New York Robert singer, Mocmillon pub lis ling.

14. Vaquera, A., Mielgo-Ayuso, J., Calleja-GONZáLEZ, J., & Leicht, A. S. (2017). Cardiovascular and perceptual stress of female basketball referees during women's international matches. The Journal of sports medicine and physical fitness, 57(4), 476.

15. Zina, Ahmed M. (2006): Self-concept and leadership ability among international sports referees in Egypt. PhD dissertation - Faculty of Physical Education for Men – Banha University (in Arabic).