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Improving Football Shooting Skills Through the Use of Interactive Flat Panel Display

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ABSTRACT

This study aims to improve the football shooting skills of 10th-grade high school students through the use of Interactive Flat Panel Display (IFPD) in Physical Education learning. This research uses a Classroom Action Research (CAR) design based on the Kemmis and McTaggart model, which consists of the stages of planning, action, observation, and reflection conducted in two cycles. The research participants were 34 students of class X.2 selected using purposive sampling. Data were collected through observation sheets and analyzed descriptively using percentage formulas to determine the achievement of learning mastery. The results of the study show a significant improvement in students' football shooting skills at each stage of the research. Learning mastery increased from 23.53% in the pre-cycle to 100% in the second week of Cycle II. The average score also increased from 59.80 to 97.06. The findings indicate that the use of IFPD effectively enhances students' understanding of shooting techniques through interactive visual displays, video analysis, frame-by-frame motion observation, and repeated demonstrations. The implementation of IFPD creates a more interactive, innovative, and student-centered learning environment that boosts students' motivation, participation, and psychomotor performance in Physical Education learning. This study implies that the integration of digital interactive media such as IFPD can support the improvement of practical sports skills in schools.

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B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
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INTRODUCTION

Physical education and sports play a role in the formation of character, sportsmanship, discipline, and the development of the affective, cognitive, and psychomotor aspects of students (Syaputra et al., 2023). The learning process in the classroom has changed significantly as a result of advances in digital technology in education (A. P. Sari & Munir, 2024). The shift from traditional technology-based teaching and learning methodologies demands the development of more interactive, flexible, and learner-centered educational resources in the 21st century (Saputra et al., 2024). However, in reality, the effectiveness of

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physical education learning at the senior high school level is still often hindered by the limitations of visual media, especially in technical materials that require high precision, such as shooting in football. Students often find it difficult to observe the details of fast and complex movements if they only rely on the direct sharpness of the teacher who has limited angles of view and repetitions.

Previous research has shown that the Interactive Flat Panel Display (IFPD) is an interactive digital learning medium in the form of a touchscreen flat panel used to help make the learning process more engaging, effective, and collaborative (Bahar & Iriandy, 2025). IFPD integrates various multimedia features such as audio, video, images, animation, the internet, and learning applications in a single digital device (Jayadi, 2025). The use of IFPD in learning can increase learning motivation, student participation, attention, and students' understanding of the lesson material being taught. (Jumiati et al., 2025). In addition, the use of IFPD enhances learning in the digital era by promoting a more modern, innovative, and student-centered educational environment (Riyadi & Ningsih, 2024). There are limitations in those studies where the use of IFPD has not been specifically explored in aiding the analysis of biomechanics of movements that are very fundamental, yet most students are wrong and unable to perform them, such as football shooting, both in terms of contact and body movements in physical education learning.

One of the factors contributing to students' low skills is the learning method, which is still conventional, where the teacher only demonstrates movements directly without adequate visual media. Students have difficulty observing the details of shooting technique movements because the teacher's demonstration happens quickly and can only be seen from certain angles. Without supporting learning media, students cannot observe the movements repeatedly, slowly, or from various perspectives.

The gap arises when this interactive technology is used only as a replacement for a blackboard or simple video player, without optimizing annotation and motion analysis features to bridge conceptual understanding with practical skills in the field. IFPD allows teachers to display high-quality football shooting technique videos, perform frame-by-frame motion analysis, add annotations or markers to the visual display, and interact directly with the presented material. The use of IFPD is expected to bridge the gap between students' conceptual understanding and practical skills in shooting.

Based on this background, the researcher is interested in conducting Classroom Action Research (CAR) with the title "Improving Football Shooting Skills through the Utilization of Interactive Flat Panel Display (IFPD) in Grade X Students at Senior High School 2 Martapura." This research is expected to provide a tangible contribution to improving the quality of PJOK learning, especially on the material of basic football techniques at the senior high school level.

METHODS

The design in this study uses Classroom Action Research (CAR) based on the Stephen Kemmis and Robin McTaggart model. Classroom Action Research is a reflective

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study aimed at continuously improving learning practices through the stages of planning, action, observation, and reflection carried out in cycles (Rabgay & Kidman, 2023). In this study, actions were carried out through the pre-cycle stage, cycle I, and cycle II to improve the quality of the learning process and outcomes of the students (Wijaya et al., 2023).

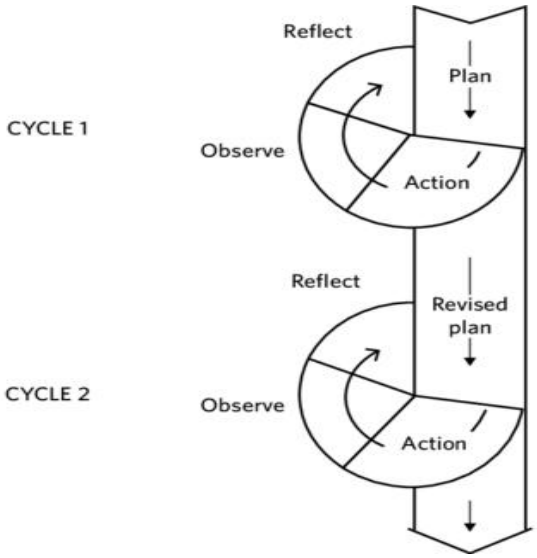

Figure 1.
Flow of Classroom Action Research (CAR)

The research population is all research subjects who have certain characteristics according to the research objectives and have a relationship with the problem being studied (Candra Susanto et al., 2024). The population in this study is all students of class X.2 Senior Hig School, totaling 34 students.

In this study, the purposive sampling method was used, which is a technique of determining samples based on specific considerations according to the research objectives (Akbar et al., 2025). The sample used consisted of 34 students from class X.2 because this class experienced problems with football shooting skills and was in accordance with the research objective, which aimed to improve learning outcomes through the use of an Interactive Flat Panel Display (IFPD) in PE lessons.

The data analysis technique in this study was carried out to determine the improvement of students' football shooting skills through observation results using observation sheets. The obtained data were analyzed quantitatively descriptively using a percentage formula. The percentage analysis was used to determine the level of students' learning completeness in each research cycle. The percentage formula used is as follows:

$$P = \frac{F}{N} \; x \; 100\%$$

The results of the percentage calculation are then broken down to determine the level of success in learning football shooting skills in each cycle of classroom action research.

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RESULTS AND DISCUSSION

Result

Based on the image, the percentage of completeness and incompleteness, the percentage of students increased in each cycle. In the pre-cycle, completeness was only 23.53% and incompleteness was 76.47%. In cycle I, completeness increased to 79.47% while incompleteness decreased to 23.53%. In cycle II, all students reached 100% completeness and there were no students who were incomplete (0%). These results indicate that the learning actions applied were able to significantly improve students' learning completeness.

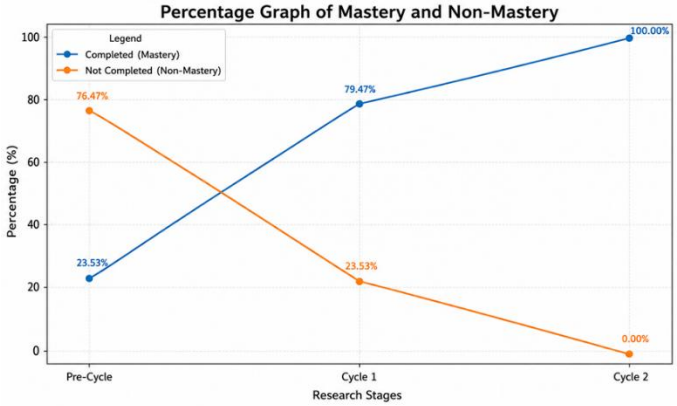

Figure 2.
Percentage of Completed and Incomplete

Based on Figure 3, the average score, minimum score, and maximum score, there was an increase in the average score, minimum score, and maximum score of students in each cycle. The average score increased from 59.80 in the pre-cycle to 78.71 in Cycle I and 97.06 in Cycle II. The minimum score also increased from 42.86 to 61.90 and finally to 90.48. Meanwhile, the maximum score increased from 76.19 in the pre-cycle to 90.48 in Cycle I, reaching 100.00 in Cycle II. These results indicate a significant improvement in learning outcomes after the implementation of the learning action.

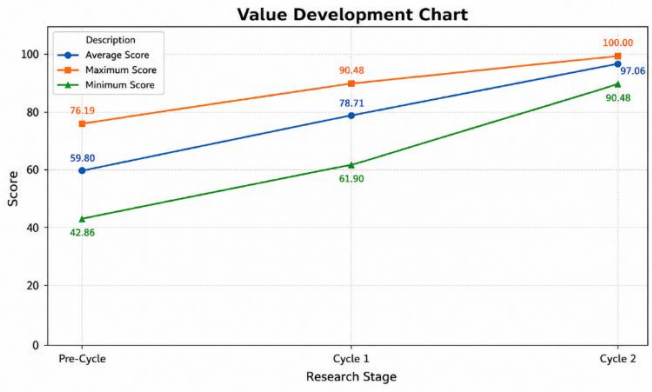

Figure 3.
Average Score, Minimum Score, and Maximum Score

Based on Figure 4, the number of students who achieved mastery increased in each cycle. In the pre-cycle, only 8 students achieved mastery, while 26 students did not. In Cycle I, the number of students who achieved mastery increased to 26, and the number

of students who did not achieve mastery decreased to 8. Furthermore, in Cycle II, all students achieved mastery with a total of 34 students, and there were no students who did not achieve mastery. These results indicate a significant improvement in students' learning outcomes.

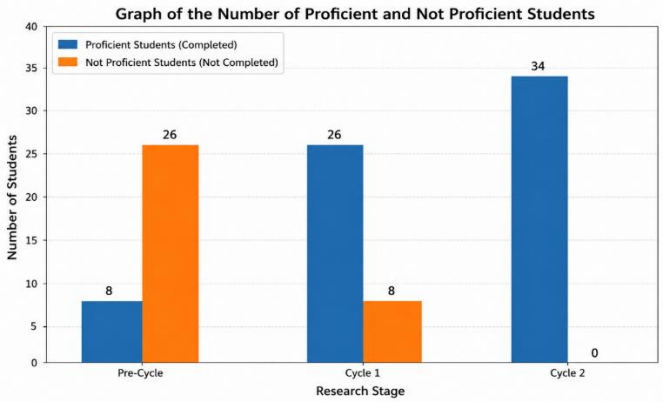

Figure 4.
Number of Students Completed and Not Completed

Table 1.
Interactive Flat Panel Display (IFPD) Utilization Shooting Skills Results

Classification	Pre-cycle	Cycle 1	Cycle 2
Completed Frequency	8	26	34
Complete Presentation	23,53%	79,47%	100,00%
Incomplete Frequency	26	8	0
Incomplete Percentage	76,47%	23,53%	0,00%
Minimum Completion Criteria	75	75	75
Average value	59,80	78,71	97,06
Maximum value	76,19	90,48	100,00
Minimum Value	42,86	61,90	90,48

Based on the learning outcome data, there was a significant increase in students' skills from the pre-cycle stage to Cycle II. At the pre-cycle stage, the number of students who achieved mastery was only 8 students (23.53%), while 26 students (76.47%) had not yet mastered the material. The class average score was 59.80 with a maximum score of 76.19 and a minimum score of 42.86. These results indicate that the students' abilities were still below the Minimum Mastery Criteria (KKM) that had been set.

After actions were carried out in cycle I and cycle II, the students' learning outcomes showed a very good improvement. In cycle I, the number of students who completed the material increased to 26 students (79.47%) with an average score of 78.71. Furthermore, in cycle II, all students achieved completeness, totaling 34 students (100%) with an average score increasing to 97.06 and a maximum score reaching 100.00. These data indicate that the applied learning actions were able to optimally improve the students' learning outcomes.

Discussion

The implementation of the Classroom Action Research Cycle in PJOK learning on football shooting material is carried out through several systematic stages to overcome

students' low skills due to conventional methods. The following are the details of the implementation of each cycle:

At the pre-cycle stage, the researcher conducted planning by preparing a shooting skills assessment instrument to determine the initial abilities of 34 students in class X.2. The action assistance stage was carried out using conventional learning methods without digital interactive media. Based on the observation results, students still had difficulty understanding the details of the shooting movements, so the shooting accuracy was still low. At the reflection stage, it was found that students needed more engaging and interactive visual learning media in order to better understand shooting techniques.

In cycle I, the planning stage focused on the preparation of lesson plans by integrating the use of the Interactive Flat Panel Display (IFPD) as a learning medium. The action stage was carried out by showing tutorial videos on shooting techniques and utilizing video control features so that movements could be observed repeatedly. The observation results showed an increase in students' attention, motivation, and understanding of shooting movement coordination. However, in the reflection stage, there were still some students who made mistakes with their foot positioning and ball contact, so the completeness of learning the positions had not yet reached optimal results.

In cycle II, the planning stage was carried out by utilizing the annotation and frame-by-frame motion analysis features on IFPD. The action stage actively involved students in observing and analyzing body positions, foot angles, and shooting techniques before conducting field practice. Based on the observation results, student engagement and understanding of shooting techniques increased significantly compared to the previous cycle. The reflection stage showed that the use of IFPD could improve students' psychomotor learning outcomes until all students achieved learning mastery.

Theoretical Analysis of Skill Improvement through IFPD This research strengthens the theory that IFPD is not merely a replacement for the whiteboard, but an interactive digital learning medium capable of making the learning process more effective and collaborative (Kurniawan & Hakim, 2024). The use of IFPD has been proven to increase students' attention, participation, and learning motivation because of its ability to integrate audio, video, and animation into a single device (A. M. Sari et al., 2026).

This aligns with the needs of 21st-century learners who require interactive and adaptive media. (Bani, K.N., Falasifah, F.Iskandar, 2025). Specifically in physical education learning, IFPD is able to overcome obstacles in observing complex movements that occur quickly. With frame-by-frame analysis and annotation features, teachers can dissect the details of fundamental biomechanical movements, such as foot contact with the ball, which are difficult to do through manual observation. Students' ability to observe movements slowly and repeatedly from various angles helps form an accurate mental image, thereby minimizing technical errors during practice on the field. Thus, the use of IFPD clearly contributes to the transformation of learning into a more modern, innovative approach that is oriented towards improving the quality of student learning outcomes.

CONCLUSION

Based on the results of the classroom action research that has been conducted, the use of Interactive Flat Panel Display (IFPD) in physical education (PJOK) learning has been proven to improve the kicking (shooting) skills of 10th-grade senior high school students in football. This improvement is evident from the students' mastery of the learning, which gradually increased from 23.53% in the pre-cycle to 100% in cycle II. In addition, the students' average scores also increased from 59.80 to 97.06. These results indicate that the use of IFPD-based interactive learning media can help students understand kicking techniques more clearly, in detail, and attractively. With the use of videos, motion analysis, and visual elements that allow students to more frequently and accurately examine shooting skills, IFPD in physical education offers a more dynamic, creative, and student-centered learning experience. Therefore, the Interactive Flat Panel Display (IFPD) is a useful teaching aid to improve the football shooting skills of 10th-grade senior high school students during physical education lessons. It is recommended that physical education teachers utilize the Interactive Flat Panel Display (IFPD) in various other sports resources to use interactive visual analysis capabilities to examine movement details.

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