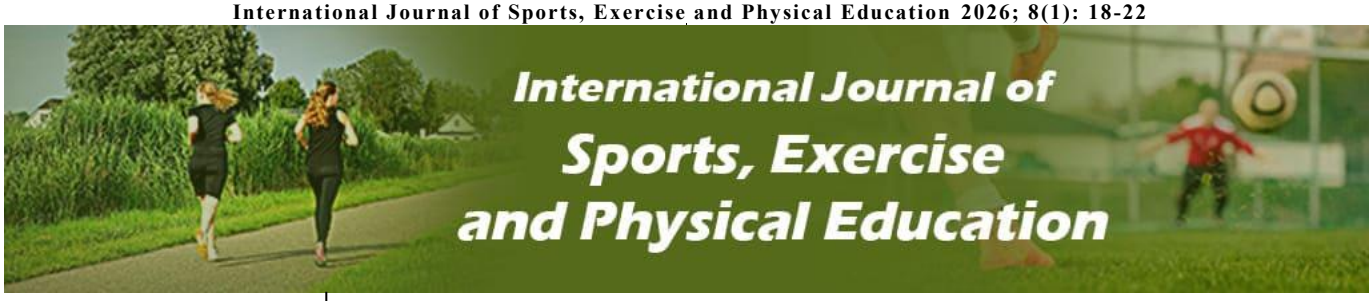

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The effectiveness of a teaching program using the problem-based learning strategy in developing shooting and passing skills in basketball

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Abstract
The purpose of the research was to identify the effectiveness of a teaching program using the problem-based learning strategy in developing shooting and passing basketball skills among female students of the Faculty of Physical Education and Sport Sciences - University of Babylon. The researcher used the experimental method using the method of two equal groups (experimental and control), as the research sample consisted of (60) female students, with (30) female students in each group. The experimental group underwent a teaching program based on the problem-based learning strategy, while the control group studied according to the traditional method followed.
Skill tests were used to measure shooting accuracy, the accuracy of the chest pass and other passes, as well as technical and tactical performance assessment forms before and after the program was implemented. Data were statistically processed using arithmetic averages, standard deviations, and t-test for independent samples.
The results of the research showed that the teaching program based on the problem-based learning strategy was clearly effective in improving the accuracy of the basketball shooting among the members of the experimental group compared to the control group. The program has also contributed to the development of the accuracy of the chest pass and other passes statistically significantly, demonstrating its efficiency in developing basic basketball skills. The results showed the superiority of the experimental group in technical and tactical performance, especially in decision-making, positioning, and movement without a ball, as well as the existence of significant statistical differences between the two groups in all research variables and in favor of the experimental group. The research confirms that the problem-based learning strategy is more effective than the traditional teaching method in developing skill and tactical performance in basketball.

Keywords: Problem-based learning, basketball, shooting accuracy, passing skills

Introduction
Shooting and passing skills are one of the key elements on which basketball players' success depends to improve their performance and achieve victories, as they require a high degree of concentration and precision, as well as a technical understanding of the correct movements. The research aims to explore the effectiveness of problem-based learning strategies in enhancing students' abilities to perform shooting skills and pass efficiently. The problem-based learning strategy is a modern approach that allows the learner to acquire knowledge by facing real problems, which stimulates critical thinking and meets the needs of active learning. In this context, it is based on the design of a flexible teaching program that contains targeted activities aimed at developing learning situations in an interactive and innovative way, with a focus on practical applications that ensure the formation of technical and technical skills in a real-life environment. The program focuses on organizing the learning stages in a systematic and thoughtful manner, so that students go through the stages of problem detection, solution planning, implementation, and evaluation, which enhances their innovative abilities and strengthens their collaboration and teamwork skills. Thus, the research aims to provide a comprehensive vision that contributes to improving the quality of basketball teaching, and achieving tangible results at the level of basic skills, while emphasizing the importance of adapting educational programs to suit the needs of students, and developing their abilities in a sustainable way that supports their sports and academic careers.

Therefore, the importance of the research lies in enhancing the effectiveness of the educational methods used in developing the basic skills in basketball, as shooting and passing skills are considered one of the main pillars that directly affect the performance of players, and identifying the most efficient methods for developing them contributes significantly to raising the level of training and achieving distinguished sports results.

Research Problem

Despite the importance of developing shooting and passing skills in basketball to raise the efficiency of students' technical performance, relying on traditional methods of teaching does not keep pace with the requirements of active learning and does not stimulate critical thinking during play. Also, the lack of employment of interactive strategies such as learning on problems limits students' ability to link training situations with solving field problems, so the need to try a modern teaching program that integrates scientific practice and analytical thinking and aims to improve the level of basic basketball skills in an effective systematic way has emerged.

Research Objectives

1. Following the Teaching Program Based on the Problem-Based Learning Strategy in Improving the Shooting Accuracy in Basketball among the Students of the Faculty of Physical Education and Sport Sciences - University of Babylon.
2. To determine the extent of improvement in the accuracy of the chest pass and other passes after the implementation of the program on the problems among the students of the Faculty of Physical Education and Sport Sciences - University of Babylon.
3. Analysis of statistical differences in technical and tactical performance between the experimental and control groups of the research sample.

Research Hypothesis

There are statistically significant differences between the average scores of students for the experimental and control groups in the basketball shooting and passing skills test in telemetry and in favor of the experimental group.

Research Areas

- **Human Field:** Students of the first stage at the Faculty of Physical Education and Sport Sciences, University of Babylon.
- **Temporal Domain:** Academic Year 2024-2025.
- **Spatial Field:** Sports Hall of the Faculty of Physical Education - University of Babylon.

Field Research Procedures

1. **Research Methodology:** The researcher adopted the one-group experimental method to suit the nature of the research procedures and achieve its objectives.
2. **Research population and sample**

- The current research population was identified with 145 students of the Faculty of Physical Education and Sport Sciences - University of Babylon for the first stage of study.
- **Research Sample:** The research sample for each group was determined by using the order from 1-145 and randomly numbered for (60) students only, so that (30) of them represented an experimental group randomly and (30) students represented the control group.

Means, Tools and Devices Used

- Research Methods:
- The researcher used the following research methods and tools in collecting data
- Questionnaire
- Personal Interview
- Tests & Measurement

Procedures for Implementing the Research Steps

Steps to build the educational program

1. Analyze needs by identifying performance issues (poor aiming/passing under pressure).
2. Design of pivotal problems by formulating incomplete scenarios related to realistic match situations.
3. Structuring the session through:

- **Presentation:** Divide learners into groups and present the problem.
- Analyze by discussing the causes of the problem and proposed solutions.
- Apply by implementing simulation exercises for target skills.
- Calendar by providing instant feedback.

4. **Integrate Resources:** Using videos and performance analysis apps to support learning.
5. **Rating:** Includes

- Formative by monitoring performance during activities.
- Final and includes a practical test based on performance criteria.

6. **Flexibility:** By adjusting problems according to the level of learners.

Identifying the target skills in the current research

Some basic skills in the game of basketball were identified, which are (shooting skill and handling skill)

Defining technical performance tests for skills

In order to approve the technical performance tests for skills, the researcher has nominated approved tests in the game of basketball to achieve the objectives of the study, which are the technical performance tests of skills related to the current research, which are:

Aiming Test

- **Free throws:** 10 shots ← percentage of injuries
- **Moving Points:** 5 points × 3 throws ← accuracy/60 seconds
- **Under Pressure:** Aim after passing + Defender ← accuracy/5 attempts

Handling

- **Wall Pass:** 30 seconds ← number of correct passes
- **Multiple goals:** 5 goals × 3 passes ← minutes/45 seconds
- **Movement:** Pass between moving players ← success + time/3 rounds

Building Special Exercises in the Tutorial

The researcher built an educational program for (8) weeks and (6) units per week for the students of the first stage at the Faculty of Physical Education and Sport Sciences - The

University of Babylon in the subject of basketball is based on the existing educational system in the faculty for the subject of basketball, and the following table shows the division and a model of an educational unit according to the teaching strategy followed.

Table 1: Shows the sample instructional lesson plan using the problem-based learning strategy in the game of basketball

Activity/Stage	Detailed Description	Assessment Tools and Tools	Activity Time	Teacher's Notes	S
Introduction and Problem Introduction	The teacher presents a problematic situation in basketball and asks the question, "How can we improve our passing and shooting accuracy?	Basketball, photos or videos of passing and shooting situations	5 minutes	Stimulating Critical Thinking for Students	1
Troubleshoot and Solve	Students discuss the causes of poor passing or aiming and identify strengths and weaknesses.	Whiteboard for writing down ideas, worksheets	10 minutes	Encouraging Collective Participation	2
Develop a solution plan	Design a practical training plan to improve passing and shooting in small groups.	Basketball, Cones Illustrations	10 minutes	*Follow up*on each group and provide support	3
Practical Training	The students implement the plan on the field, practice passing and shooting the ball from different positions.	Basketball court, basketballs, cones	25 minutes	Monitor performance and provide instant feedback	4
Self-Assessment and Group Assessment	Each group evaluates the results of the plan implementation, and the teacher gives feedback.	Evaluation papers, short calendar videos	10 minutes	Promote self-paced and collaborative learning	5
Conclusion and Conclusion	Draw the most important lessons and discuss their application in real matches.	Whiteboard or projector	5 minutes	Linking Learning to Practice	6

Scientific Parameters of Tests

Honesty

The authenticity of the tests was confirmed by presenting them to experts and specialists in the game of basketball, and their authenticity was confirmed based on the opinions of experts and specialists.

Stability

The stability of the test was confirmed through the use of the test method and retest to find the stability coefficient, where the test was applied to the emerging players and was repeated after a week and under the same conditions, and it was calculated by the simple correlation law (Pearson) between the first and second tests, and after the statistical treatment of the results, it was found that the calculated value of (t) is (0.95).

Objectivity

The correlation coefficient of the ranks (Spearman) was extracted and it was found that the calculated value of (t) is equal to (0.89) which is greater than the grandfather value which is equal to (0.83) which indicates that it has a high degree of objectivity

Pre-Tests

The researcher conducted the pre-tests in order to establish the scientific facts of the technical performance of the skills of the young Iraqi players before starting the implementation of the program prepared in the hall of the Faculty of Physical Education - Babylon in order to identify the reality of the role played by the program in influencing the level of technical performance of students.

Main Experiment: The main experiment was applied to the researcher's sample of (60) students from the first stage, if (30) students represented the experimental sample and (30) students were the control sample.

Post-tests: After the end of the implementation of the educational program and in order to determine the reality of the level of development in the performance of the students as a result of the implementation of the prepared educational program and its impact on the development of the level of skill performance of the students, the researcher conducted tests at the end of the educational program after completing the eighth week of education on the playgrounds of the hall of the Faculty of Physical Education - University of Babylon.

Statistical Methods

The researcher analyzed his results using the statistical software (SPSS).

Presentation, analysis and discussion of the results

Following the Teaching Program Based on the Problem-Based Learning Strategy in Improving the Shooting Accuracy in Basketball among the Students of the Faculty of Physical Education and Sport Sciences - University of Babylon.

Table 2: Shows the arithmetic mean and standard deviation of the degree of accuracy of shooting in the pre- and post-tests for both groups

Testing	Arithmetic Average	Standard deviation	Moderate improvement (post-pre-pre)
Before me	8.3	1.3	6.0
Go away	14.1	1,5	
Before me	7.9	1.7	2.4
Go away	10.2	1,9	

From the table above, it can be seen that the average improvement in accuracy in the experimental group was (6.0) points, which is much greater than that of the control group, which is (2.4) points.

Figure (1) shows the average improvement of the experimental and control groups in the results of the test (post-pre-test)

Table 3: Shows the results of the (T) test for the independent groups to compare the difference in improvement (dimensional-tribal) between the two groups

Impact Size	Significance Level	Degree of Freedom	Value (T)	Statistical Analysis
1.96	0.000*	58	8.675	Comparison of Improvement Averages

From the above table, it is shown that the value of the significance level (0.000*) is less than (0.01), which indicates that there is a very high statistically significant difference between the two groups in improving accuracy.
The results showed that the value of (T) (8.675) was large and confirmed the strength of this difference, and the size of the effect (1.96) is considered very large according to the Cohn criteria, which means that the problem-based learning strategy has a strong and tangible scientific impact on improving accuracy.

To determine the extent of improvement in the accuracy of the chest pass and other passes after the implementation of the program on the problems among the students of the Faculty of Physical Education and Sport Sciences - University of Babylon

Table 4: Shows the results of the evaluation of the technical performance through the skill assessment form (aiming, passing, moving without a ball)

Significance	Sig	Calculated value (T)	Telemetry	Tribal Measurement	Collection
D	0.000	8,56	56.80	55.32	Experimental
			74.23	53.95	Officer

From the table above, we can see that there is a statistically significant difference in the technical performance in favor of the experimental group, and the following figure illustrates this.

Discussion of the results

The research results showed that there was a statistically significant improvement in the accuracy of shooting in the experimental group compared to the results of the control group, and this improvement is attributed to the adoption of a teaching program, which is a problem-based learning strategy, which puts students in educational situations similar to the reality of actual play, which contributes significantly to improving motor coordination and the accuracy of skill performance. (Hmelo-silver, 2004) [5].
Problem-based learning also helps learners understand the requirements of skill performance and not just repeat it, as the skill of shooting is linked to different play situations, which leads to increased motor awareness and improved movement control during performance.
The current research result is also in line with what the study came up with. Griffin It showed that the use of problem-based learning strategies contributes to the development of basic skills in team games, especially shooting skills that require quick decision-making in different and changing situations (Griffin *et al*., 1997) [4].
In another direction, the research results showed a significant improvement in the accuracy of the chest pass and other passes in the experimental group, due to the fact that the problem-based learning strategy relies on teamwork and interaction between students, which provides greater opportunities for practical training on passing in conditions similar to real competition (Burroughs, 2002) [1].
The problem-based program also helps students to connect motor skill and planning situations where passes are executed in the context of play rather than in isolation, which increases the efficiency and accuracy of the performance compared to the traditional method. (Mitchell, Oslin & Griffin, 2006) [7].
These results support the findings of previous studies in the field of basketball education, which emphasized the use of modern methods in teaching that contributes to improving various passing skills because they provide realistic learning situations and various motor challenges. (Meimert and Harvey, 2008) [6].
The statistical results also showed that there are statistically significant differences in technical and tactical performance between the two groups and in favor of the experimental group, due to the fact that problem-based learning focuses on the development of planning thinking and decision-making in addition to skill performance, which reflects positively on the technical and tactical level of students. (Himelo-Silver, 2004) [5].
The improvement in the tactical performance of the experimental group also indicates the students' ability to read situations and make the appropriate decision during play, which is confirmed by modern motor learning theories that believe that optimal performance in group games is achieved from previous learning in actual play.
This result is consistent with what Schmidt & Lee pointed out that integrating technical skills with tactical aspects during learning leads to an overall improvement in athletic performance, especially in team games that rely on collaboration and quick thinking. (Schmidt & Leee, 2011) [10].

Conclusion

1. The instructional program based on the problem-based learning strategy proved to be effective in improving the accuracy of the basketball shooting in the experimental group compared to the control group.
2. The problem-based program contributed to the statistically significant improvement of the accuracy of the breaststroke and other passes, demonstrating its efficiency in developing basic basketball skills.
3. The results of the statistical analysis showed that the experimental group was superior to the control group in technical performance, and this is due to the program's reliance on realistic educational situations that simulate the conditions of actual play.
4. The members of the experimental group achieved a significant improvement in tactical performance, especially in decision-making, positioning, and movement without the ball.
5. The results showed that there were statistically significant differences between the experimental and control groups and in favor of the experimental group.
6. Current research emphasizes that traditional teaching is less effective compared to the problem-based learning strategy in developing skill and tactical performance in basketball.

Recommendations

1. Adopting a problem-based learning strategy in teaching basketball skills in the faculties of physical education and sports sciences.

2. Train physical education and sport science teachers to design and implement problem-based educational programs that fit the requirements of team play.
3. Introducing real-world play situations and educational problems within the educational units to develop the technical and tactical aspects of students.
4. Conduct similar studies using a problem-based learning strategy in other team games such as handball and volleyball.
5. Apply the program to larger samples and different study stages to verify the generalization of the results.
6. Use various measurement tools to evaluate technical and tactical performance in order to obtain more accurate and objective results.

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