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Research Paper

The Effect of the Cognitive Apprenticeship Strategy on Learning Basic Basketball Skills for First Intermediate Grade Students

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ABSTRACT

The research problem lies in schools' reliance on traditional teaching methods in teaching sports skills, especially in basketball, by merely delivering and memorizing information. Therefore, the researchers proposed using the cognitive apprenticeship strategy to provide learning situations that stimulate inquiry, research, and performance evaluation after executing the skills. The research aims to develop an educational curriculum based on this strategy and study its effect on learning basic basketball skills among students. The researchers adopted the experimental method and selected a sample of first-intermediate-grade students from Al-Quds Intermediate School for Boys, dividing them into two groups. The study concluded that the cognitive apprenticeship strategy significantly improves skill learning. The researchers recommended restructuring educational curricula to encourage deep thinking and creativity, developing learning environments that meet students' needs, conducting similar studies using other teaching methods, and training teaching staff on modern strategies.

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1. INTRODUCTION

The educational process has witnessed significant development, necessitating modern learning methods that enhance students' roles and develop their independent skills. Education is no longer limited to transferring information but has shifted to fostering critical and creative thinking, requiring teachers to select appropriate methods based on students' levels and abilities while considering individual differences and encouraging active learning. The cognitive apprenticeship strategy is an effective method that relies on collaborative learning and active student participation. It includes educational stages such as modeling, scaffolding, reflection, skill application, articulation, and exploration. This strategy provides a learning environment that helps students develop their skills through teamwork and interactive learning. Learning is also influenced by social and cultural environments, where "cognitive control power" plays a role in encouraging students to use procedural knowledge effectively. Thus, providing a suitable learning environment encourages independent thinking, decision-making, and academic skill enhancement.[1] The research aims to study the

effect of the cognitive apprenticeship strategy on learning basic basketball skills among first-intermediate-grade students. This strategy enhances learning through experience and practice, helping students improve their performance. In conclusion, the research highlights the importance of adopting modern teaching strategies based on interaction and collaboration, which enriches the learning experience and develops students' critical thinking skills.

Research Problem

Through the researcher's work as a faculty member at the College of Physical Education and Sports Sciences and supervising some fourth-year students during their field training in intermediate schools, as well as through field visits to several schools, it was observed that schools rely on learning methods focused on memorizing information rather than developing students' thinking skills in sports, particularly in basketball. As a result, the learning process depends entirely on the teacher. Therefore, the researcher sought to provide suitable learning situations that encourage inquiry, questioning during skill performance, and evaluating performance after completing tasks using the cognitive apprenticeship strategy and to determine its role in learning basic basketball skills among first intermediate-grade students.

2. RESEARCH OBJECTIVES

1. Developing an educational curriculum based on the cognitive apprenticeship strategy.
2. Identifying the effect of the cognitive apprenticeship strategy on learning basic basketball skills among first-intermediate-grade students.

Research Hypotheses: There are statistically significant differences in the post-tests between the research groups in learning basic basketball skills among first-intermediate-grade students.

Research Fields:

Human Field: First intermediate grade students at Al-Quds Intermediate School for Boys, Najaf, Al-Manathira Directorate of Education.

Temporal Field: From 17/10/2023 to 7/5/2024.

Spatial Field: The playground of Al-Quds Intermediate School for Boys, Najaf, Al-Manathira Directorate of Education.

3. RESEARCH METHOD

The experimental method was chosen as it is suitable for the nature of the research problem. The experimental method is considered "the most efficient approach to obtaining reliable knowledge." The research was designed using the equivalent groups design (experimental and control groups) with pre and post-tests.

Research Population and Sample

The research population was determined to consist of first-grade students at Al-Quds Intermediate School for Boys in Najaf, under the Directorate of Education in Al-Manathira, for the academic year (2023-2024), totaling (112) students distributed among three sections (A, B, C). The research sample was randomly selected through a lottery, resulting in a total of (30) students, constituting (30.17%) of the research population. These students were divided into two groups, each consisting of (10) students who had no prior experience in playing basketball. Additionally, a pilot study sample consisted of 10 students.

Table 1: Illustrates the distribution of the research population and its sample.

Grade	Sections	Total Students	Excluded Students	Pilot Study Sample	Research Sample	Percentage
First Intermediate	A	36	26		10	
	B	35	25	10	10	30.17%
	C	41				
Total	3	112	82	30		

To ensure a uniform starting point for all groups, an equivalence test was conducted for the skill tests. Table (2) illustrates this.

Table 2: Shows the equivalence of the research groups in the skill tests.

Skills	Groups	Mean	Standard Deviation	Sum of Squares		Mean Squares		F Value	True Significance	Type of Difference
				between	within	between	within			
Dribbling	Experimental	63.666	2.1269	7.244	240.667	3.622	5.730	0.632	0.536	Non-Significant
	Control	63.466	2.7996							
Chest Pass	Experimental	2.333	0.4879	0.311	9.333	0.156	.222	0.700	0.502	Non-Significant
	Control	2.200	0.4140							
Shooting	Experimental	2.466	0.5164	0.311	10.800	.156	.257	.605	0.551	Non-Significant
	Control	2.533	0.5164							

Research Tools

1. Information Collection Tools

- Direct observation
- Arabic and foreign references and sources
- Internet sources
- Data recording and extraction forms

- The Student's Guide for Learning Basic Basketball Skills.

2. Data Collection Methods

Interviews: To clarify the research problem and provide the researcher with sufficient information about this study, interviews were conducted with experts in training, motor learning, and testing.

Questionnaire: Since the questionnaire is a tool for obtaining information and data related to the research topic, the researcher designed the following questionnaires to accomplish this work.

Data Analysis Tools:

1. Three Japanese-made electronic stopwatches (CASIO)
2. HP (Pentium 4) laptop computer
3. Statistical tools
4. Hand calculator

Field Research Procedures

1. Determining the Tests Under Study

The researcher determined some basketball basic skill tests for application in his work as a basketball instructor at the College of Physical Education and Sports Science. This was done by reviewing scientific and educational sources, consulting experts in learning and teaching methods, and referring to the Iraqi Ministry of Education's sports activity curriculum. The researcher selected the basketball skill tests under study, ensuring they were standardized and applicable to the Iraqi environment and the same age group. The scientific parameters (validity, reliability, and objectivity) of the tests were conducted as follows: [2]

First Test: High dribbling over a distance of (20) meters

Second Test: Chest pass rebound against a wall

Third Test: Free throw shooting from a stationary position

Pilot Study

The pilot study serves as preliminary training to ensure the validity of the fundamental procedures and allow the researcher to identify any potential issues in the tests for better results. It is considered an initial study conducted on a small sample before carrying out the full research to test the methods and tools. Two pilot experiments were conducted on a sample of 10 first-year intermediate students from the research population on Monday and Tuesday (18th and 19th October 2023), and they were excluded from the main research sample. The objectives of the pilot study were: [3]

1. Identifying obstacles and challenges in implementing the strategies and addressing them.
2. Evaluating the appropriateness of the sample and their response to the experiment and tests.
3. Ensuring the feasibility of the exercises for the sample.
4. Determining the duration required to conduct the tests.
5. Ensuring the safety of the devices and tools, as well as their placements and dimensions.
6. Assessing the efficiency and capabilities of the assisting research team.

A pilot study for the cognitive apprenticeship strategy was conducted on Monday (18/10/2023) at 9:00 AM, where the teacher implemented the six strategy steps: (modeling, scaffolding, coaching, reflection, articulation, and exploration). The second pilot study for the skill tests was conducted on Tuesday (19/10/2023) at 9:00 AM to assess how students performed the skill tests and to determine a suitable location for them.

Main Experiment Procedures

1. Pre-Tests

The pre-tests were conducted with the assistance of the research team under the supervision of the researcher, covering some basic basketball skills on the school playground and an official basketball court. The necessary equipment was prepared, and detailed explanations were provided to the research sample on how to perform each test and the number of attempts. The final score for each student was recorded. The researcher conducted the pre-test for the basic basketball skills using the cognitive apprenticeship strategy on Wednesday (20/10/2023) at 9:00 AM. The control group's basic basketball skills test was conducted on Thursday (21/10/2023) at 9:00 AM. The researcher ensured that all variables (time, equipment, devices, research team, and test procedures) remained constant to maintain consistency for the post-tests.

2. Main Experiment

Before implementing the main experiment, the researcher conducted an introductory session for the students and research assistants on Tuesday (26/10/2023) to explain how the cognitive apprenticeship strategy would be applied to teach some basic basketball skills. The control group received the same skills as the experimental group but through the traditional command-style teaching method used in the school. The main experiment lasted nine weeks, starting from Tuesday (26/10/2023) until Wednesday (1/1/2024), with two educational units per week for both groups, totaling 18 educational units—9 units per skill. Each educational unit lasted 45 minutes, with the main section lasting 30 minutes.

3. Post-Test

The post-tests for both research groups on basketball basic skills were conducted after completing the educational units on Thursday (2/1/2024) at 9:00 AM. The researcher ensured that the post-tests were conducted under the same conditions as the pre-tests regarding time, location, equipment, and devices to achieve accurate results.

Statistical Methods: The researcher used the SPSS statistical package.

4. RESULTS

Presentation and Analysis of the Researched Variables' Results

Table 3: Means, Standard Deviations, Computed t-value, and Significance of Differences between the Experimental and Control Groups in the Post-Test for Learning the High Dribbling Skill under Study

Skill	Unit of Measurement	Experimental Group		Control Group		t-Value	Error Level	Significance of Differences
		Mean	Standard Deviation	Mean	Standard Deviation			
High Dribbling	Score	7.15	0.69	2.89	0.82	12.5	0.006	significant

Significant at the (0.05) significance level with a degree of freedom (8).

Table 4: Means, Standard Deviations, Computed t-value, and Significance of Differences between the Experimental and Control Groups in the Post-Test for Learning the Chest Pass Skill under Study

Skill	Unit of Measurement	Experimental Group		Control Group		t-Value	Error Level	Significance of Differences
		Mean	Standard Deviation	Mean	Standard Deviation			
High Dribbling	Score	8.900	2.190	3.80	1.26	8.54	0.000	significant

Significant at the (0.05) significance level with a degree of freedom (8).

Table 5: Means, Standard Deviations, Computed t-value, and Significance of Differences between the Experimental and Control Groups in the Post-Test for Learning the Set Shot Skill under Study

Skill	Unit of Measurement	Experimental Group		Control Group		t-Value	Error Level	Significance of Differences
		Mean	Standard Deviation	Mean	Standard Deviation			
High Dribbling	Score	8.500	1.590	3.20	1.03	8.86	0.000	significant

Significant at the (0.05) significance level with a degree of freedom (8).

5. DISCUSSION OF RESULTS

From our observations of the tables, the computed t-values are all significant for the experimental group in basketball skills (high dribbling, chest pass, and set shot). This indicates an improvement in the performance level of these skills and the overall bodily movements contributing to their execution. This improvement can be attributed to the instructional methods applied to the experimental group, which helped them learn these skills according to the required and correct technical performance. [4] The researcher attributes this improvement to the cognitive apprenticeship strategy, which helped students overcome challenges, acquire knowledge, and become more active by stimulating their thinking and cognitive skills. It also gave them a proactive and effective role in seeking solutions on their own. "Meaning and understanding are constructed by the student through the social environment in which students interact with their teachers and engage in educational activities in classrooms."[5] Cognitive apprenticeship is an instructional approach through which students acquire cognitive skills via social practice with expert performance. This approach consists of six methods through which students learn from experts: (Modeling – Scaffolding – Coaching – Reflection – Articulation – Exploration). Additionally, the steps followed by students in the cognitive apprenticeship strategy provided them with opportunities for discussion and dialogue with their peers within the same group while working collaboratively. It also fostered a spirit of cooperation and teamwork by allowing them to observe and practice models practically, and exchange roles and perspectives among themselves and with the teacher. Moreover, scaffolding and coaching enhanced activity and optimized the time spent learning skills, while reflection enabled skill evaluation and comparison with the correct model. Lastly, exploration facilitated comprehensive learning assessment through proper skill execution. [6] The teacher played a crucial role in guiding, instructing, and monitoring students' performance, supporting them when needed to enhance understanding. The teacher's role was positive and facilitative, not just a transmitter of information, by participating in organizing classroom activities and encouraging students to work in small groups, fostering engaging and interactive activities that helped them accomplish their tasks. Furthermore, the emphasis on feedback—providing students with results of their work or behavior and indicating correctness or errors—helped them rectify mistakes and reinforce correct performance. If students arrived at the correct answer on the first attempt, this success motivated them to repeat successful attempts. Conversely, failure in their attempts caused discomfort, prompting them to persist until they achieved their goals. This reinforcement enabled them to continue progressing through the learning process.[7] The researcher believes that this strategy encourages learners to think critically and deduce information to reach conclusions. It also promotes sharing knowledge with others to achieve optimal skill performance. Basketball skills require specific learning processes focusing on precision, body balance, movement agility, and coordination. Since basketball is a team sport, group learning tends to be more engaging as students learn positively within a group of peers, including classmates, teachers, and friends. This approach enhances the learner's personal experience, encouraging observation, experimentation, careful planning, and decision-making.

Additionally, feedback aimed at correcting or reinforcing performance increased students' energy and motivation. The diversity and renewal in using exercises, methods, and techniques when teaching sports skills were found to be the most suitable for creating an engaging, exciting, and enjoyable learning environment. [8] "Learning is a human process that provides the material and psychological conditions that help the learner actively interact with environmental elements in a specific context. The teacher carries out this process using an organized sequence of activities involving both theoretical and practical participation of learners. A teacher cannot succeed in their work unless they understand the nature of their students, recognize their characteristics, manage the classroom effectively, accommodate individual differences, encourage them, identify their abilities and needs, and work towards fulfilling them." [9]

6. CONCLUSIONS

1. The results of the post-tests showed a clear improvement in the research groups (experimental and control) in learning some basic basketball skills among students.
2. The cognitive apprenticeship strategy had an effective impact on the research variables compared to the traditional teaching method, as evidenced by the means obtained in the post-tests for each group.
3. The experimental group using the cognitive apprenticeship strategy outperformed the control group in learning some of the basic basketball skills under study.
4. The stages of the cognitive apprenticeship strategy, the gradual progression during instructional units, and the applied procedures were suitable for the students' level and their ability to think about the skill.

7. Recommendations

1. Utilizing the cognitive apprenticeship strategy in learning basketball skills for first-year middle school students due to its effective role in the learning process.
2. Emphasizing curriculum restructuring and reorganization so that it does not rely solely on memorization but instead helps students engage in deep thinking and creativity. Additionally, ensuring that conceptual understanding is prioritized when designing curricula in physical education and sports science to enhance students' learning environments.
3. Conducting similar studies that employ other instructional methods.
4. Encouraging research and scientific studies by the Ministry of Education and the Department of Sports Activities, focusing on the impact of modern teaching and learning methods, as well as the need for training teachers on these strategies and applying them to students.

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