EFFECTIVENESS OF TEACHING BASED ON SELF-REGULATED LEARNING THEORY IN COGNITIVE ACHIEVEMENT AND LEARNING THE BASKETBALL SHOOTING SKILL AMONG FEMALE STUDENTS

Wasan abdul-hussein hassan

University of Kufa, College of Education for Women

ABSTRACT

The research, titled "Effectiveness of Teaching Based on Self-Regulated Learning Theory in Cognitive Achievement and Learning the Basketball Shooting Skill Among Female Students," highlights the importance of employing innovative educational strategies to improve learning outcomes. This theory empowers learners to take control of their learning process by setting clear goals, utilizing suitable strategies to achieve them, and continuously assessing their performance for improvement. The study focuses on developing the basketball shooting skill, an essential skill that requires concentration and precision, along with enhancing cognitive achievement related to its technical principles. The research involved third-year female students from the College of Education for Women at the University of Kufa, divided into two groups: an experimental group taught using the self-regulated learning strategy and a control group relying on traditional methods. The experimental method was employed to evaluate the impact of the educational program, which spanned 16 teaching units over 8 weeks. The program was designed to include incremental exercises and tasks fostering learners' independence and ability to apply theoretical concepts in practice. The results showed that the experimental group significantly outperformed the control group in cognitive achievement and shooting accuracy, underscoring the effectiveness of teaching based on self-regulated learning. The study concluded that this strategy enhances students' autonomy, improves their cognitive and skill performance, and provides a dynamic and engaging learning environment. The researcher recommended adopting such educational strategies in curricula, emphasizing the importance of using supportive teaching tools and integrating composite exercises with skill learning. This approach contributes to enhancing students' cognitive and motor performance in sports and other fields. Future studies were suggested to explore broader applications of self-regulated learning theory in various educational domains.

KEYWORDS: *Self-Regulated Learning Theory (SRL) , Cognitive Achievement and Basketball Shooting Skill*

INTRODUCTION:

The field of education is witnessing continuous development in methods and strategies aimed at enhancing the effectiveness of the learning process. Among these strategies, the self-regulated learning (SRL) theory stands out as a modern approach that places learners at the center of managing and developing their skills. SRL enables students to set educational goals, choose appropriate strategies, and evaluate their progress to improve their performance.

In physical education and sports, developing athletic skills and enhancing students' cognitive achievement are primary objectives. The basketball shooting skill represents a fundamental ability requiring high focus,[1] consistent practice, and an accurate understanding of its technical principles. Innovative educational strategies, such as teaching based on SRL theory, become essential to achieve these goals effectively.[2]

This research aims to study the effectiveness of teaching based on SRL in improving cognitive achievement and developing the basketball shooting skill among female students. The focus arises from the need for educational strategies that foster active student participation and support tangible progress in cognitive and skill aspects.[3]

The study tests the hypothesis that applying SRL principles can enhance students' cognitive achievement and practical performance in basketball shooting. Its significance lies in bridging theory and practice, opening new avenues for advancing sports education using scientifically grounded strategies.

Research Problem:

Despite the advancements in modern teaching methods, many students still face challenges in making tangible progress in cognitive achievement and developing practical skills in team sports like basketball. The basketball shooting skill, requiring high focus and precise technical understanding, often remains underdeveloped due to traditional teaching methods that fail to fully engage students. This highlights the need for innovative strategies to enhance student autonomy and performance. This research investigates the effectiveness of SRL-based teaching in improving cognitive achievement and basketball shooting skill development among female students, exploring its impact on their engagement and competence.

Research Objectives:

1. Design a teaching program based on SRL theory to enhance students' cognitive achievement in basketball.
2. Assess the impact of the SRL-based teaching program on cognitive achievement among female students.
3. Evaluate the effect of the SRL-based teaching program on learning the basketball shooting skill.

Research Hypothesis:

The researcher hypothesizes a positive impact of the SRL-based teaching program on cognitive achievement and learning the basketball shooting skill among female students.

Research Scope:

- **Population:** Third-year female students, College of Education for Women, Department of Physical Education and Sports Sciences, University of Kufa.
- **Timeframe:** November 1, 2023 – April 1, 2024.
- **Location:** Sports hall, College of Education for Women, Department of Physical Education and Sports Sciences, University of Kufa.

METHODOLOGY:

The researcher employed the experimental method, using an equivalent group design suitable for the study's objectives.

Study Population and Sample:

The study population comprised 37 third-year students from the Department of Physical Education and Sports Sciences, College of Education for Women, University of Kufa, for the academic year 2023-2024. A random sampling method was used to select 30 students, divided equally into an experimental group (15 students) and a control group (15 students).

Sample Homogeneity:

To ensure the homogeneity and equivalence of the sample members and confirm the normal distribution of the data, the researcher used the mean, standard deviation, and skewness coefficient for the results of the field survey across measurements (biological age, weight, height, and the applied tests).[4] These are presented in Table 1.

Table 1. Show homogeneity of the sample in growth indicators (weight, height, and chronological age):

Variables	Mean	Standard Deviation	Median	Skewness Coefficient
Height (cm)	163.83	1.87	165.50	-0.456
Weight (kg)	61.08	2.54	58.50	0.860
Age (years)	20.50	1.65	20.43	0.170

The skewness coefficient values ranged between ±1, as shown in Table 1, indicating that the sample is homogeneous in growth indicators (height, weight, and age). Skewness values (-0.456, 0.860, and 0.170) falling within the ±1 range suggest a normal distribution. Any deviation beyond this range would indicate a sampling error.

Tools and Equipment for Data Collection: Tools for Data Collection:

- **Personal Interviews:**
- **Tests and Scales:**
- **Arabic and Foreign References and Sources:**
- **Observation:**

Identification of Variables in the Research:*Cognitive Achievement Test in Basketball:*[5]

Defining the Scientific Material:

The test covers scientific content related to the basketball shooting skill, including:

o   Proper body positioning during shooting.
o   Optimal shooting angle.
o   Force applied during shooting.
o   Timing of the shot.

Formulating Behavioral Objectives:

Behavioral objectives were defined based on Bloom's Taxonomy of the Cognitive Domain:

o   **Recall:** Recall basic shooting rules.
o   **Understanding:** Explain the impact of body positioning and shooting angle on shooting accuracy.
o   **Application:** Choose the correct position for shooting in different scenarios.
o   **Analysis:** Analyze shooting errors based on practical performance.

Specifications Table Design:[6]

A specifications table was designed linking behavioral objectives to content components:

o   **Recall:** 40% (questions on basic shooting rules).
o   **Understanding:** 20% (questions on interpreting shooting positions).
o   **Application:** 30% (questions on choosing the correct answers in specific situations).
o   **Analysis:** 10% (practical performance analysis).

Test Item Design:[7]

o A total of 20 multiple-choice items were prepared, covering the behavioral objectives.
o Sample item:
▪   *"What is the optimal shooting angle from the free throw line?"*
▪   A. 30 degrees
▪   B. 45 degrees
▪   C. 60 degrees
▪   **Correct Answer:** B

Statistical Analysis of Items:[8]

o Difficulty and discrimination coefficients were analyzed for test items to ensure suitability.
o Items with difficulty coefficients between 0.2-0.8 and discrimination coefficients above 0.4 were selected.

Validity and Reliability:[9]
o **Validity:** Items were reviewed by experts to ensure they accurately measure the shooting skill.
o **Reliability:** The test was applied twice to the same sample, and reliability was calculated using the split-half method.
o **Objectivity:** Uniform scoring ensured objectivity.

Test Instructions:
o Students were instructed to circle the correct answer.
o One point was awarded for each correct answer, and zero for incorrect answers.

Pilot Application:
o The test was applied to a pilot sample to ensure the clarity of items and instructions.
o Time allocated: 20 minutes.

Final Application:
o After adjustments based on the pilot test, the final test was administered to the research sample.

Shooting Accuracy Test from a Stationary Position:[10]
- **Purpose:** Measure shooting accuracy from a stationary position.
- **Required Equipment:** Basketball court, basketball hoop, and basketball. **Procedure:**

- Each player attempted three sets of five consecutive shots from the free throw area (center and both sides).
- A resting period was provided between sets.

Scoring:
- **2 points** for each successful shot.
- **1 point** for hitting the rim without scoring.
- **Total Score:** Sum of points across 15 attempts, with a maximum score of 30.

Pilot Study for Program Application:
- The pilot study was conducted on February 6, 2024, at 10:00 AM with a sample of 5 students. The goals were to:
- Ensure the adequacy of tools used in teaching units.
- Assess the students' understanding of the self-regulated learning program.
- Determine the most effective methods for conducting exercises.
- Evaluate the ease of transporting tools to the hall.

Main Experiment:
Pre-Tests:
Pre-tests were conducted on March 3, 2024, at 10:00 AM in the college sports hall for both experimental and control groups. All conditions related to time, place, equipment, and procedures were standardized for consistency in post-tests.

Educational Program Implementation:
The program consisted of 16 educational units (20 minutes each), implemented twice a week (Sunday and Tuesday). Exercises were structured progressively and aligned with self-regulated learning principles.

Post-Tests:
Post-tests were conducted on March 28, 2024, under the same conditions as the pre-tests.

Results, Analysis, and Discussion:
Results and Analysis of Pre- and Post-Tests:

Control Group:

Table 2. Shows the arithmetic mean, standard deviation and t-value of the variables under study

Variables	Unit	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD	t-value	Significance
Cognitive Achievement	Points	4.33	0.50	4.87	0.51	3.15	Significant
Shooting Accuracy	Points	2.44	0.53	5.11	0.60	11.31	Significant

Experimental Group:

Table 3. Shows the arithmetic mean, standard deviation and t-value of the variables under study

Variables	Unit	Pre-Test Mean	Pre-Test SD	Post-Test Mean	Post-Test SD	t-value	Significance
Cognitive Achievement	Points	4.68	0.42	5.49	0.40	3.73	Significant
Shooting Accuracy	Points	2.89	0.60	6.44	1.42	6.71	Significant

The results show significant improvements in both cognitive achievement and shooting accuracy for the experimental group, affirming the effectiveness of self-regulated learning strategies.

Discussion of the Pre- and Post-Test Results for Cognitive Achievement and Skill Performance for Both Control and Experimental Groups

Based on Tables (8) and (9), significant differences were observed between the pre- and post-test results for cognitive achievement and skill performance, favoring the post-test results for both groups.

The improvement in the post-test values for the control group's variables is evident, showing significant differences compared to the pre-test results. This development can be attributed to the structured educational units based on the curriculum designed by the Sectoral Committee of Sports Education in Iraqi universities,[11] which emphasized repetition in performance and continuity in implementing the allocated units for teaching the stationary basketball shooting skill. Additionally, the participants' rapid skill development is influenced by their age group's enthusiasm, motivation, and eagerness to learn and understand the required tasks, especially as they are beginners.[12]

As noted by Qasim (1998), the goal of this stage is to acquire motor skills in general rather than achieve perfect mastery or stability in motor performance. The primary purpose is to equip learners with the ability to perform movements at an acceptable level while conserving effort.[13]

Presentation, Analysis, and Discussion of Post-Test Results for Cognitive Achievement and Skill Performance for the Control and Experimental Groups

Table 4. Post-Test Results for Cognitive Achievement and Skill Performance

Variables	Unit	Control Group	Experimental Group	t-value	Significance
Cognitive Achievement	Points	4.87	5.49	2.88	Significant
Shooting Accuracy	Points	5.11	6.44	16.90	Significant

Independent t-tests revealed significant differences between the control and experimental groups in post-test results, favoring the experimental group.

Discussion of cognitive achievement and skill performance between the control and experimental groups

The significant differences in post-test results between the two groups favor the experimental group. These differences are attributed to the effectiveness of the self-regulated learning (SRL) strategy incorporated into the educational curriculum. This

strategy contributed to the development of cognitive achievement and the correct learning of the stationary basketball shooting skill.14

This skill requires a unique and continuous teaching approach rather than relying solely on the learner's inherent abilities, which develop through sustained practice. The exercises based on SRL principles designed by the researcher outperformed the traditional curriculum, as evidenced by the control group results.15

The supportive tools significantly contribute to the development of cognitive achievement and motor skills specific to the specialized activity.16

The researcher believes that providing learners with appropriate tools and aids during exercises, tailored to the nature and type of each task, helped maintain the number of repetitions and ensure their timely execution. 17

CONCLUSIONS
1. The SRL-based teaching strategy has a positive impact on cognitive achievement and the learning of the stationary basketball shooting skill.
2. Supportive tools play an effective role in improving cognitive achievement and the stationary basketball shooting skill for the experimental group.
3. The experimental group significantly outperformed the control group in cognitive achievement and the stationary basketball shooting skill.

RECOMMENDATIONS
1. Emphasize the use of supportive teaching tools to develop cognitive achievement and motor skills, particularly the stationary basketball shooting skill.
2. Generalize the use of such tools in educational programs for coaches, teachers, and practitioners in other sports.
3. When teaching the stationary basketball shooting skill, integrate compound exercises with skill acquisition to enhance the effectiveness of the SRL-based teaching approach.

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