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The Effectiveness of Using The Method Of Educational Complexes in Developing Cognitive Motivation and Learning Some Basic Skills in Handball

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Abstract. *This study investigated the impact of the educational complexes method on developing cognitive motivation among students, specifically aiming to show improvements in the experimental group's post-test results. An experimental methodology was employed, chosen for its effectiveness in controlling independent variables and accurately measuring their influence on dependent variables. The research sample comprised 86 second-year students from the Faculty of Physical Education and Sports Sciences at Al-Maaref University for the 2024-2025 academic year, selected via purposive sampling. The study focused on two crucial handball skills: dribbling and shooting. Data were collected using a cognitive motivation scale questionnaire, a skill test around a rectangular field, and a shooting accuracy test. Following pre-tests and the main experimental intervention, post-tests for skill and cognitive motivation were administered. Analysis of the data (Tables 1, 2, and 3) revealed a noticeable improvement in learning levels for both cognitive motivation and handball skills across both the experimental and control groups when comparing pre-test to post-test results. The findings conclude that the educational complexes method effectively increases students' cognitive motivation and significantly enhances the learning process for handball dribbling and shooting skills.*

Keywords: *Educational Complexes, Cognitive Motivation, Learning, Skills In Handball.*

1. INTRODUCTION

The educational system is witnessing a continuous development in teaching methods, especially in the fields of physical education and sports, because of their pivotal role in developing the physical, skill, and cognitive abilities of learners. Team games, especially handball, are sports activities that require the integration of physical, skill, and mental aspects, which require the use of effective teaching methods that ensure the achievement of educational objectives efficiently and effectively.

Among the modern methods that have proven their usefulness in the educational field is the method of educational complexes, which allows learners the opportunity to self-learn within an organized educational environment, through stations or complexes, each of which contains various educational tasks that suit individual differences and give the student a pivotal role in the learning process.

Although this method is common in some subjects, its employment in the field of physical education, especially in teaching basic handball skills, is still limited and needs more research and experimentation, especially in relation to the cognitive motivation of learners, which is one of the essential factors that affect the extent of their integration and interaction with educational activities.

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From this standpoint, this research seeks to investigate the effectiveness of using the educational complexes method in developing cognitive motivation and learning some basic skills in handball, in an attempt to provide an effective educational model that supports an active learning environment and enhances learners' motivation towards acquiring sports skills.

The importance of research lies in providing a modern educational method (educational complexes) that contributes to the development of cognitive motivation among learners and improves the learning of basic skills in handball. It also helps to activate self-learning, take into account individual differences, and motivate learners to actively participate in an effective educational environment, which supports the development of teaching strategies in physical education and enhances students' skill and cognitive performance.

Research Problem

Despite the continuous progress in teaching methods, many physical education professors still rely on traditional methods of teaching sports skills, which often lack diversity and take into account individual differences, which negatively reflect on learners' motivation and ability to acquire skills effectively. Handball is a team game that requires a combination of physical skills and cognitive understanding, which requires innovative teaching methods that create an interactive and stimulating learning environment. Therefore, the researcher used the method of educational complexes as one of the methods that provide opportunities for self-learning and active learning within an organized educational environment, as the effectiveness of this method in developing cognitive motivation and learning basic skills in handball is still not sufficiently studied, which requires experimental verification.

Research Objectives

- To identify the effect of the educational complexes method on developing cognitive motivation among students in the experimental group, with an expected improvement favoring post-test results.
- To demonstrate the effectiveness of the educational complexes method in teaching dribbling and shooting skills in handball when compared to the traditional teaching method.
- To determine the superior performance in the post-tests for all research variables when comparing the experimental and control groups

2. MATERIAL METHODS

Study Design

The researcher employed an experimental method, deeming it the most appropriate approach to achieve the study's objectives. This methodology facilitated precise control over the independent variables and accurate measurement of their impact on the dependent variables (Ali et al., 2024; H. H. Khalaf et al., 2024; Omar et al., 2025).

Participants

The research sample comprised 86 second-year students from the Faculty of Physical Education and Sports Sciences at Al-Maaref University, enrolled during the academic year 2024-2025. This sample was selected using a purposive sampling method. The students were divided into two equal divisions: the experimental group, consisting of 43 students, and the control group, also consisting of 43 students.

Research Instruments and Data Collection Methods

Here's a clear and concise breakdown of the devices, tools, and means used for collecting information in your research:

Research Instruments and Tools

Sports Equipment: 8 handballs, a standard handball court.

Measurement Devices: Whistle, tape measure, stopwatch.

Data Collection Methods

Literature Review: Arab and foreign scholarly sources.

Primary Data Collection: Questionnaire.

Digital Resources: Internet.

Identify Handball Skills

Two skills were selected from the skills taught within the curriculum of the second stage – the Faculty of Physical Education and Sports Sciences, which are of great importance in this game, namely, the high jump and shooting from movement.

Tests used in the Research

1. Cognitive motivation scale form. (Saleh Qasim, 2004, 36).

Application of scale:

The researcher applied the measure of mathematical cognitive motivation to the research sample, as the method of answering the paragraphs of the scale was clarified and explained in front of the students by placing a sign (/) in front of the paragraph that he deems appropriate and applies to him and emphasizing that the answer to all paragraphs is accurate

and clear. The grades are distributed as follows. It does not apply to (0) degrees, applies to it with a small degree (1) degree, applies to it with an average degree (2) degree, applies to it with a large degree (3) degree. As described in Appendix 1.

2. Test the skill of tabtaba around a rectangular playground. (Ismail, 2002, p. 63).

- Objective of the test: Measure the skill of tabba with both hands.
- Tools used: Handball, stopwatch, playground (26×14) pm, time registration form.
- Performance: The student stands in one corner of the field and constantly pats the ball with one hand while rotating around the field to make a full turn.
- Conditions: The test is performed with the hand used for aiming and then repeated with the other hand.
- Registration: Calculates the time recorded in performing a full lap around the stadium.

3. Test of aiming accuracy from a distance of 9 m. (Diaa Al-Khayyat, 2001, p. 492)

- Purpose of the test: Measuring the accuracy of the aiming handball
- Tools: Handball court, 5 handballs, accuracy squares measuring (50) by (50) cm, number 2.
- How to perform: The ball is corrected from an area located at a right angle from the middle of the goal line and a distance of 9 meters for men and 8 meters for females, provided that the shooting is preceded by taking one step so that the player does not cross the specified area trying to enter the ball in the box and the shooting is once on the right square and another on the left square.
- How to register:
  1- Each ball that enters the suspended box in the goal counts and scores the player the correct number of hits for the two squares.
  2- The player is given 5 attempts.

Exploratory Experiment

The researcher conducted an exploration experiment on 3/11/2024 on a sample consisting of (4) students who are from outside the main sample in order to identify the method applied to the experimental group and know the appropriateness of its application and understanding of the sample members, as well as knowing the mechanism of implementing tests and identifying the obstacles that the researcher may face during implementation (Ali & Hamid, 2021).

Field research procedures.

Pre-tests.

In preparation for the pre-tests, the researcher meticulously organized the necessary measurement tools for both the control and experimental groups. Student names within each group were accurately recorded. The pre-skill tests and cognitive motivation assessments were then administered to both the control and experimental groups on November 4-5, 2024. All data was diligently recorded in pre-prepared logs, ensuring that all relevant testing conditions were noted for consistency during the post-tests.

Equivalence of the two research groups.

Table 1: Shows the equivalence of the sample

No:	Variables	Unit of measurement	Control group		Experimental Group		(v) Calculated	Differences
			M	SD	M	SD		
1	Measuring cognitive motivation	degree	62	5.21	61.12	5.1	0.54	Immoral
2	Pampering skill	number	16.51	2.31	16.48	2.24	0.97	Immoral
3	Aiming skill	number	3.22	0.62	3.24	0.58	0.58	Immoral

Tabular value (T) (1.99) at degree of freedom (43+43-2=84) and significance level 0.05

Main Experience

To improve both the skill performance and cognitive development of second-year students in the Faculty of Physical Education and Sports Sciences, a main experiment was initiated on November 7, 2024. This experiment specifically targeted the experimental group and employed the educational complexes method, a modern active learning approach.

The focus of the experiment was on two fundamental handball skills: dribbling and shooting. These skills were chosen because they demand a high level of motor perception and cognitive awareness. The educational complexes method is designed to address individual learning differences and stimulate motivation by organizing content into educational stations. These stations offer diverse activities, promoting both self-learning and collaborative engagement among students.

Through this two-month experiment, consisting of two units per week, the researcher aimed to investigate the impact of this method on enhancing skill performance and boosting students' cognitive motivation. These two elements are considered crucial for developing a

student's integrated athletic personality. In contrast, the control group continued to receive instruction through the traditional teaching method delivered by the subject professor.

Post tests

Following the completion of the main experiment, the researcher, assisted by the work team, administered the post-tests for skill proficiency and cognitive motivation. These tests were conducted on January 11-12, 2025, for both the control and experimental groups, under conditions identical to those of the pre-tests.

Statistical Analysis

The researcher utilized the Statistical Package for the Social Sciences (SPSS) as an essential tool for analyzing and extracting statistical data. (Hammood et al., 2024; Y. A. Khalaf et al., 2025; Mohammed Hammood et al., 2025).

3. RESULTS

Results: Pre- and Post-Test Analysis of Cognitive Motivation and Handball Skills

1. Analysis of Control Group Pre- and Post-Test Results: Cognitive Motivation, Dribbling, and Shooting Skills.

Table 2: Descriptive Statistics and Paired Samples t-test Results for the Control Group.

Variables	Unit of measurement	Tribal		Post		Difference of arithmetic means	Standard deviation difference	(v) Calculated	Moral
		M	SD	M	SD				
Cognitive motivation	degree	62	5.21	68	5.23	6	5.9	6.66	Moral
Pampering skill	second	16.51	2.31	15.22	2.04	1.29	2.44	3.38	Moral
Aiming skill	degree	3.22	0.62	4.15	0.43	0.93	2.55	2.44	Moral

The tabular value of (t) is (1.68) at a degree of freedom of (42) and a significance level of (0.05).

2. Analysis of Experimental Group Pre- and Post-Test Results: Cognitive Motivation, Dribbling, and Shooting Skills.

Table 3. Shows the arithmetic means, standard deviations, above the median, their standard deviation, the value of (T) calculated for cognitive motivation, and the skills of patting and shooting with handball for the experimental group.

Variables	Unit of measurement	Tribal		Post		Difference of arithmetic means	Standard deviation difference	(v) Calculated	Moral
		M	SD	M	SD				
Cognitive motivation	degree	61.12	5.1	75	4.95	13 .88	7.11	12.85	Moral
Pampering skill	second	16.48	2.24	14.31	2.11	2.17	3	4.82	Moral
Aiming skill	degree	3.24	0.58	4.61	0.41	1.37	2.5	3.60	Moral

The table value of t is (1.68) at a degree of freedom of (42) and a significance level of (0.05).

Comparative Analysis of Post-Test Results: Cognitive Motivation, Dribbling, and Shooting Skills Across Control and Experimental Groups.

Table 4: Descriptive Statistics for Post-Test Results: Cognitive Motivation, Dribbling, and Shooting Skills Across Experimental and Control Groups

Variables	Unit of measurement	Experimental Group		Control group		Value(v) Calculated	Significance of differences
		M	SD	M	SD		
Measuring cognitive motivation	degree	75	4.95	68	5.23	6.42	Moral
Pampering skill	second	14.31	2.11	15.22	2.04	2.06	Moral
Aiming skill	degree	4.61	0.41	4.15	0.43	4.6	Moral

Tabular value (T) (1.99) at degree of freedom (43+43-2=84) and significance level 0.05

4. DISCUSSION

Analysis of the data reveals significant statistical differences. Table 2 shows these differences between the pre- and post-test results for the control group in cognitive motivation and the handball skills of dribbling and shooting, indicating a noticeable development in performance after program implementation. Similarly, Table 3's analysis revealed significant statistical differences between the pre- and post-test results for the experimental group, reflecting the effectiveness of the educational complex's method in improving cognitive motivation and developing skills. Furthermore, Table 4 demonstrates the superiority of the

experimental group, as the calculated t-value for all variables was greater than the tabular value, indicating significant differences favoring the experimental group.

Significant improvements in learning outcomes were observed across both the control and experimental groups, specifically in cognitive motivation and the handball skills of dribbling and shooting. This progress is evident from the comparison of pre-test and post-test results, as detailed in Tables 2, 3, and 4. Notably, the experimental group exhibited a significantly higher rate of development than the control group. Furthermore, post-test results (Table 3) confirmed the experimental group's superiority across all research variables.

This marked advantage in the experimental group is directly attributable to the effectiveness of its integrated instructional method, which utilized modern educational strategies. These strategies were crucial in boosting learners' motivation and practical skills. As Magdi Aziz (1999) noted, "the method of educational complexes instills in the student a sense of the value of the achievement attained according to a specific, entrusted goal within a defined and brief timeframe" . This approach catered to individual differences by structuring educational units within learning complexes. It focused on teaching handball dribbling and shooting skills while simultaneously enhancing cognitive motivation. The inclusion of diverse exercises also provided ample opportunities for comfortable practice and task execution. Robert (1999) further highlighted that "Teaching within educational complexes is characterized by its flexibility in activity selection and learning at one's own pace and ability, creating conditions that empower learners to take on a positive role in every educational situation they encounter".

The exercises applied to the experimental group were pivotal in the learning process for the two investigated handball skills. These exercises were chosen meticulously, progressing in an organized and gradual manner by difficulty. Their functional impact was clear in the improved coordination between the nervous and muscular systems, aligning with Bourqouin's (2003) assertion that "the development of compatibility is one of the main objectives of physical education".

The researcher also proposes that the educational complexes method encourages critical and analytical thinking among students. This, in turn, enhances their motivation to acquire knowledge and skills by organizing information and abilities into interconnected clusters. Ultimately, this method significantly deepens students' understanding of fundamental handball concepts.

5. CONCLUSION

1- The use of educational complexes has the effect of increasing students' cognitive motivation.

2- The method of educational complexes has had a major role in improving the process of learning the skills of patting and shooting handball for students

6. RECOMMENDATIONS

1- The need to integrate the method of educational complexes into the curriculum to develop students' cognitive motivation and learn basic skills in handball. Train teachers to use this method effectively to increase students' motivation and improve their performance.

2- Conduct future studies to explore the impact of this technique on other aspects of sports learning. Reworking.

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