

The effect of the constructive technique (active learning cycle) on students' development of some volleyball skills and cognitive achievement

Assist. Prof. Dr Hazem Ali Ghazi^{1,*}, Assist. Prof. Dr. Hussam Hussein Matansh²

¹ PhD. Student. Faculty of Physical Education and Sports Sciences, University of Babylon, Iraq

² PhD. Student. Faculty of Physical Education and Sports Sciences, University of Babylon, Iraq

* Corresponding author, Email: Hazem.ghazee@qu.edu.iq

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Abstract

The purpose of this study is to determine the impact of the constructive approach, the active learning cycle, on cognitive accomplishment and the acquisition of some volleyball abilities for students at the College of Physical Education and Sports Sciences / University of Al-Qadisiyah. In addition to before and post measurements of the variables under inquiry, the researcher utilized the experimental approach (a control group and an experimental group). The researcher created an accomplishment exam with (115) paragraphs and tested it on a sample of second-year students at the College of Physical Education and Sports Sciences for the academic year 2021/2022. Division (D) represented the control group, which was acquired in the traditional manner, whereas Division (E) represented the experimental group, which learned using the active learning cycle technique. The statistical bag (SPSS) was used for the statistical procedures, and the research yielded numerous outcomes, including the presence of statistically significant differences in favor of the experimental group, which employed the active learning cycle technique to teach the control group the skills of sending and receiving transmission as well as knowledge acquisition in volleyball. The study came to the conclusion that adopting the active learning cycle helped students master some volleyball skills. Based on the findings, the researcher made a number of recommendations that might aid in the learning and development of teaching techniques used during physical education and sports science lessons, as well as for various games and in current ways. The learning process happens quickly and without boredom.

Keywords: Structural strategy, cognitive achievement, volleyball.

1- Introduction

The globe is witnessing a remarkable development in all aspects of life in general, particularly sports, which has prompted specialists to look for ways to maintain with the rapid development, mainly in the subject of teaching methods in both theoretical and practical parts of the lesson and work on searching for modern strategies for the purpose of showing the lesson as required and moving away from traditional methods or methods of use. Despite being a passive recipient, the student may now actively engage in the educational process. During the presentation, the two researchers observed numerous students' failure to learn and comprehend scientific topics. Because the students are not participating in the educational process and the comprehension of the links between them, and without utilizing any sensory methods, the events of the learning process towards the lesson may have an ideal impact. As a result, the researchers thought that there was an urgent need to develop a new technique and models to assist learners at various educational levels in learning ideas effectively. This is accomplished by evaluating their function in the various educational phases, viewing them as active thinkers rather than just retaining facts and knowledge.

The study is significant because there is an urgent need to employ current ways of teaching volleyball for the second stage at the College of Physical Education and Sports Sciences, as well as to build attitudes toward it. By adopting a constructivist technique, the looping process of active learning may be interrupted. The research problem of the studies discovered that the majority of instructors do not employ current tactics and strategies. Which provides an opportunity for students to participate in the educational process, even if only in a small way, and to move them away from the old ways and work seriously in contributing to the involvement of the student learner in the educational process, as well as the fact that the researchers are professors in the College of Physical Education and Sports Sciences. Eventually opted to employ the constructive technique and investigate its impact on the active learning cycle and cognitive attainment of sending and receiving abilities in the game of volleyball for students in the second stage.

The study aimed for statistically significant differences in favor of the experimental group, which employed the active learning cycle technique to master the abilities to send and receive the transmission. Regarding cognitive achievement in volleyball for the control group, which was taught in the traditional manner. Assuming the study is accurate, there is no statistically significant difference between the mean achievement scores of the experimental group learners and the control group children. The active learning course is effective in providing students with the direction to learn some volleyball skills other than the traditional method.

2- Methodology

Because it is ideal with the nature of the study topic, the researchers utilized the experimental approach of two equal groups with a before and post-test.

- **Population and sample size for the study:**

The purposeful technique was used to choose the study population, which consists of second-year students at the College of Physical Education and Sports Sciences / University of Al-Qadisiyah for the academic year 2021-2022.

There were (120) students in total, with the research sample consisting of (24) individuals divided into two divisions. Division (D) was assigned to represent the control group, whereas Division (E) was assigned to represent the experimental group.

The researchers eliminated a portion of the sample, specifically female and male students who failed, postponed, or were missing from pre-examinations.

- **Tests used:**

- Testing the skill of the accuracy of the transmission facing from above (2: 159).

- **Purpose of the test:**
Purpose of the test: To measure the player's serving skill in match-like situations.
- **Equipment:**
Legal volleyball court, volleyballs.
- **Performance specifications:**
The player stands in the center of the court line (the half facing the intended half of the court, 9 meters away from the (net), and serves (in any fashion) such that the ball crosses the net to the planned half of the court from this position.
- **The conditions:**
 - 1- Each participant has 10 chances.
 - 2- If the ball contacts the net and travels to the intended half of the court or goes outside, one attempt will be recorded for the player (within 10 tries) but no points will be awarded.
- **Registration**
Every time a correct serve is recorded, the number of times the ball lands in the planned half of the court is recorded, as the player has (10 attempts) in this test. The degree is broken into 1-4 degree zones. The maximum possible score is 40. If the ball lands on a line between two areas, the player receives the first area score.
- **Test of reception ability (1:18)**
The test's aim is to assess receiving ability.
Volleyball court, volleyball equipment.
Specifications for performance: The back assault area is divided into two sections, each measuring (4.5 x 3) m, and is separated into a rectangle of 9 x 3 m. There will be two rectangles, each 4.5 by 3 m in size, dubbed (A, B).
 - The player attempts five times from each region. (A, B).
 - In the middle (2), a table may be defined, and a player can stand on top of it. (as a target).**Register:**
 - (3) Points are awarded for receiving and directing the ball toward the goal.
 - (2) Two degrees for the ball making contact with the goal.
 - (Zero) for a ball that is far from the goal.

- **Determine the academic subject:**

Based on the language of the volleyball issue, the researcher chose the scientific subject that he would study for the second stage of the two skills of sending and receiving volleyball. Determining the cognitive achievement test's behavioral objectives:

Table (1) illustrates the researcher's set of behavioral objectives, which included (115) behavioral goals that measured four of Bloom's cognitive levels (remembering, comprehending, applying, and analyzing).

Table (1): The behavioral objectives and their number for the skills of sending and receiving volleyball transmissions

No.	Behavioral objectives of the transmission skill	Number of goals	No.	Behavioral objectives of the transmission reception skill	Number of goals
1	Remembering	21	1	Remembering	14
2	Understanding	25	2	Understanding	13
3	Application	10	3	Application	12
4	Analysis	9	4	Analysis	11

The researcher provided these objectives to experts and professionals with specialized knowledge in order to assess their appropriateness for transmitting and receiving volleyball messages. The researcher acquired expert opinion, which is that these objectives are representative and cover the behavioral field to be taught, despite the phrasing of some behavioral objectives modified to be more obvious.

- Development of cognitive accomplishment test questions for sending and receiving transmission skills:

The researcher developed questions for each of the transmitting and receiving skills' behavioral aims. In contrast, the achievement test questions were of the type (multiple choice) with four alternatives to answer, each question consists of a progressive phrase called (the original), followed by a list of suggested answers called (alternatives), as well as the student must choose one of these alternatives.

- Preparing the accomplishment test:

Using the methodological vocabulary of volleyball and the behavioral aims, the researcher created a multiple-choice achievement exam. It had (115) paragraphs. It was given to a group of experts and professionals in teaching techniques to gain their feedback and observations, and it was deemed legitimate after certain changes were made to it. The researcher used the Ka-square as a measure for paragraph validity, obtaining apparent sincerity. The content was also analyzed for the skills of sending and receiving transmission into its elements, identifying the behavioral objectives to be achieved at the end of the experiment, creating a table of specifications, and developing an achievement test appropriate for the table of specifications and consistent with the specific behavioral objectives, all of which verified the content's validity.

- Number of educational units (the major experience):

For the experimental group, 12 educational units were produced to teach the abilities of sending and receiving transmission using the constructivist technique (active learning cycle). According to the approach employed by the teacher to teach skills, the same number of units were created for the control group in proportion to the behavioral purposes and for each lesson. The units' models were then given to a panel of arbitrators and professionals to check their acceptability and measurement for the stated aims. It was altered to adopt the final version in light of their thoughts and ideas, and similarly, the remainder of the instructional units were developed.

- The final application of the knowledge accomplishment exam for transmitting and receiving transmissions in volleyball:

The curriculum units were prepared for each week after the experimental curriculum became ready for application using the constructive strategy (active learning cycle), as the curriculum was applied at a rate of two educational units per week for each experimental and control group on Tuesday 2/2/2021 and ended on Thursday 3/18/2021, after which it was applied Cognitive achievement test, according to its instructions, with the assistance of the work team assisting the recitation.

- Statistical means:

In order to achieve the objectives of the current research, the researcher used the statistical bag (SPSS).

- Show results:

- Presenting and discussing the findings of pre and post skill testing for the control group:

Table (2) The arithmetic means, standard deviations, and (T) values derived for the control group's pre and post volleyball skills assessments

Tests Skills	Tribalism		Dimensionality		(T) Calculated	Significance
	Going to	±p	Going to	±p		
Send	22.461	3.045	26.538	2.757	3.19	Moral
Transmission reception	16.308	2.689	20.769	2.386	2.025	Moral

* The tabular value of (T) at the level of significance (0.05) and the degree of freedom (11) is equal to ().

- Presenting and discussing the findings and analyses of the experimental group's before and after skill tests:

Table (3) The arithmetic means, standard deviations, and (T) values derived for the experimental group's before and post testing of volleyball transmitting and receiving skills

Tests Skills	Tribalism		Dimensionality		(T) Calculated	Level of significance
	Going to	±p	Going to	±p		
Transmission	23.154	2.996	31.846	2.734	4.942	Moral
Transmission reception	18.462	2.47	32.077	2.397	3.617	Moral

* The tabular value of (T) at significance level (0.05) and degree of freedom (11) is equal to ().

- Presenting and evaluating the post-skill test results and analyses for the control and experimental groups:

Table (4) The arithmetic means, standard deviations, and (T) values generated in the posttests for the skills of sending and receiving volleyball transmissions for the control and experimental groups

Tests Skills	The control group		Experimental		(T) Calculated	Level of significance
	Going to	±p	Going to	±p		
Transmission	26.538	2.757	31.846	2.734	2.161	Moral
Transmission reception	20.769	2.386	32.077	2.397	4.266	Moral

* The tabular value (T) is significant (0.05), and the degree of freedom (11) is equal to (1.796).

-Presenting, evaluating, and discussing the experimental and control group values for the cognitive achievement test:

Table (5) Illustrates the arithmetic mean, standard deviation, and variance of the achievement test results achieved by students in the experimental and control groups

The Collection	Arithmetic mean	Standard deviation	Contrast	T value		Degree of freedom	Level significance
				Calculated	Tabular		
Experimental	10,02	1,808	6,539	4,16	2,07	22	Moral
The control group	7,68	2,15	9,275				

The findings of the cognitive accomplishment test for the research sample are shown in Table (4), with variations in averages favoring the experimental group.

- **Discussion of the results:**

The results demonstrate that the experimental group, which learned the constructive strategy of the active learning cycle, exceeded the control group. The researcher assigned this advantage to the experimental group's use of the constructivist strategy, which is an active cognitive activity requiring mental effort. It emphasizes the active participation of students in learning by having them participate in various activities in groups or teams. It additionally highlights intellectual engagement in the action, resulting in meaningful learning based on comprehension and constructive learning, which is distinguished by qualities and specifications distinct from traditional learning.

Particularly in reshaping concepts in the learner's mental environment, because the learner himself can build his knowledge through his thinking ability, and confirms that the learner's role is active with others in forming specific mental models to solve some of the problems confronting him. Furthermore, learners expand their knowledge via experiences and involvement in activities such as cooperative learning and conversations. (3: 117). The phases of the active learning cycle also followed an inductive pattern from part to whole, which is compatible with the constructivist approach pattern. Because it is related to the activity of students and their ability to link the information they reach and draw conclusions by putting them in a problem that leads them to a solution.

The researcher attributes the experimental group's growth and superiority over the control group to the organization of the applied curriculum and its suitability for the research sample by organizing content experiences in such a way that learning the skills of sending and receiving transmissions for the game of volleyball is facilitated. For the interpretation of the data of the experimental group's advantage over the control group, which was researched utilizing the active learning cycle technique. Although the learning cycle is an exploratory technique, studying within it has assisted in spreading the excitement of investigation among students when they meet new phenomena.

They observe, examine, and experiment with research and inquiry in order to generate answers and select the best choice for performance, so expanding their knowledge and skills. As a result, people acquire favorable attitudes toward learning competent performance of abilities, and this notion originates from the basic rule that the person builds or produces his or her own understanding or knowledge based on his or her own experience. He uses these experiences to disclose the ambiguity of his surroundings or to solve the difficulties that he is directed to address, i.e. the learner is active. (4: 752). Furthermore, the students follow the strategy's construction of stations or small groups and encourage and build on each other's talks.

As the study is conducted in this manner, hypotheses are assumed in order to identify answers and so improve students' perspectives. Allowing them to perform played the most important part

in the events of the learning process, and it is apparent from this that we must "provide the opportunity to involve students in thinking, searching, and investigating the correct performance of the skill to be learned." This growth demanded the creation of teaching techniques and acceptable ways for using current apps that are fit for the teaching process by preoccupying them with how to accomplish." (5: 2)

- Conclusions

After presenting and debating the findings and employing statistical methodologies, the researcher arrived to the following conclusions:

1- The constructive technique of the active learning cycle outperformed the traditional way in terms of increasing students' cognitive accomplishment when acquiring the abilities of sending and receiving volleyball.

2- The research stages for the active learning cycle method helped to the renewal and growth of knowledge among students through the teaching process.

3- Despite traditional approaches, the constructivist model assisted the instructor in planning, organizing, and conserving effort.

4- When using this strategy, the interaction with the teacher as well as the students with each other was achieved, which led to an increase in motivation towards learning the skills of sending and receiving volleyball.

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