



The effect of the circular shape strategy on the level of skill performance of the two skills of serving from the bottom and serving from the top facing in volleyball

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Abstract

The research aims to identify the effect of the circular shape strategy on the level of motor performance of the skills of serving from the bottom, and serving from the top facing in volleyball, in the academic year (2021 / 2022) they were chosen in a simple random way, and the researcher used the experimental method by experimental design, and the study was applied on a sample of (40) female students from the second year of middle school at Hamad Town Preparatory School. They were chosen randomly and were divided into two groups. One of them is experimental comprising 20 students onto which the circular shape strategy is applied. The traditional strategy is applied on the other group, also comprising 20 students in the "commands" style. This style is followed in teaching the motor performance of the skills of serving from the bottom and serving from the top facing in volleyball. The researcher concludes that the effectiveness of learning the skills of serving from the bottom and serving from the top facing in volleyball, using the circular shape strategy for the students of the experimental group was more effective than the method of commands (explanation and presentation) of the control group.

Introduction and research problem:

The world is witnessing great developments in the fields of teaching and learning, as a result of the development of brain research, psychological and educational sciences, and educational research during the past two decades that witnessed a major shift in the vision of the educational process by researchers. This has sparked an interest in the means by which knowledge is formed and acquired, and what takes place inside the student's brain, such as his/ her previous knowledge, and his/ her ability to remember and process information. (19: 205)

Strategies of formal organizations are among the learning tools compatible with the brain, as they help students to understand, extract and synthesize complex ideas, and enable them to select important ideas and details, and discover missing information. (18: 228)

The Roundhouse diagram strategy is one of the constructivist teaching strategies proposed by Wandersee in 1994. He used it in teaching practical education courses at the University of Louisiana. It is a suggested strategy used to provide explanations and describe the topics, where the learner focuses on the general idea and then breaks it down into parts, starting from the general to the specific. (16: 798)

It also helps the learner to understand the processes of science, enhances the learner's self-efficacy, increases his self-confidence, and helps him/ her to make decisions in various life situations. (27: 577)

Haya Al-Mazrou (2005) considers the circular house shape as "a learning strategy for an overall representation of topics, procedures and activities, and focuses on drawing circular shapes that correspond to the conceptual structure of a specific part of knowledge, so that the center of the circle represents the main subject to be learned, and the

external sectors represent the components of the subject.” (8: 13)

Bahira Ibrahim (2014) indicates that it represents the totality of the topics, procedures, and activities. It focuses on drawing circular shapes that correspond to the conceptual structure of a specific part, so that the center of the circle represents the main topic to be learned, and the seven outer sectors represent the components of the topic. (4 : 144)

Marwa Muhanna (2013) sees it as a set of educational activities based on the preparation of a circular visual organizer that helps present the concept through seven sectors containing the most important ideas of the concept, in addition to images or symbols for these ideas, which helps to facilitate their retrieval. (15:10)

Saadia Abdel-Fattah (2015) explains that the circular house is a two-dimensional circular geometric shape. There is a disk located in the center, divided by an optional line, surrounded by seven external sectors. The central disk represents the basic idea, while the optional line divides this idea. It could be used to contrast opposite ideas. The seven sectors surrounding the central disk are used to segment difficult concepts, arrange specific events, or to set steps to solve the problem. Thus, the learner begins to fill in the sectors clockwise starting at 12 o'clock. Then, the learner divides the information efficiently and then codes the information to link it together and facilitate its retrieval. (22:129)

The circular shape strategy is based on the adoption of a visual diagram in the form of a circular image consisting of a central axis and seven sectors which may increase or decrease by two. They are filled with information that helps learners to organize cognitive information by creating a specific scientific concept. It is a three-step process: Plan - Diagram - Reflect. Planning is done by recording the main ideas from the content. Drawing is done simply by placing icons and symbols in the seven sectors. The reflection stage involves the learner writing a paragraph to explain the circular shape. In this case, the teacher discovers misconceptions and beliefs. (9:9) (3:27) (13:2) (14:60)

There are many strategies that are used in teaching, including the circular shape strategy, which is one of the organizational schemes for scientific knowledge. This is because it is in the form of a circular geometric shape divided by a transversal line, surrounded by seven external sectors so that it represents the form of the conceptual structure for a limited part of knowledge. The surrounding seven sectors are used to fragment difficult concepts, to arrange the sequence of events, or to learn the steps of solving problems. Learners fill in the shape clockwise from 12 o'clock. (19:26)

The circular shape strategy provides learners with a framework that helps them build their knowledge about a scientific concept. It also reflects the path they take in building that knowledge. In addition, it encourages dialogue, discussion, and communication among them. This is because it helps them decide the best way to analyze the data they have reached. Thus, students build their knowledge with their peers. It also develops social relations with each other. (3:11)

Hassan Shehata (2007) considers that training learners using meaningful learning strategies is necessary to achieve a breakthrough in school learning and raise the level of learners away from verbal memorization. He states that the aim is to build a foundation of knowledge based on modern educational theories which care about the learner, the study material, and the teaching and learning activities. This is to create a new learner for a new society in order to shift the culture of education from being a culture of memorization and creativity to a culture of thinking. (7:35)

Muhammad Ramadan (2018) (13) identified that the basic elements of the circular shape strategy are “creative visual performance, a two-dimensional geometric shape consisting of seven sectors that may increase or decrease by two, based on constructive cognitive foundations, the sequence of ideas and their interdependence, and the existence of a process of coding and drawing of concepts and knowledge.”

Objectives of the circular shape strategy:

Ward and wandersee (2003) state that the design of the circular shape develops several forms of intelligence in the learners, such as linguistic intelligence through discussions that take place between them, logical intelligence through the brainstorming that the learners will do to include ideas in the seven sectors within the shape, and visual and spatial intelligence because the shape visually organizes information. Therefore, the information is easy to remember and recall. Lastly, there is social intelligence through learners designing the shape in the form of a cooperative group. (25 : 579)

The stages of forming the strategy of the circular house shape:

The strategy of the circular shape passes through three stages, which are:

- **Planning stage:** It is the first stage of building the round house, in which learners use the following: (specify the main ideas you are looking for - write your own title - write your goals behind building this plan - take the whole concept and draw seven sectors that can decrease or increase by two - paraphrase the concept in each sector - make sure that each concept sequentially relates to the next concept).

- **Design stage:** At this stage, the learners fill in the blanks in the circular shape clockwise sequentially with the rest of the other sectors. It is preferable during this stage to write the title in detail in order to entice the learners and to help them grasp the concepts at the outer layer of the diagram. Through this, the learners reflect on the main ideas and learn to write titles, paraphrase, and summarize concepts. They also develop critical thinking and self-assessment skills

- **Reflection:** The last stage is meditation. After the learner has completed the figure and received feedback from the teacher, he/ she must explain, in his/ her own expression and style, what the figure means, using his/ her own words about the meaning of the figure. (24:205) (26:119)

The teacher's role in the circular shape strategy:

The teacher plays a constructive and essential role in the strategy of the circular shape, and this role is represented in the following:

- The teacher plans the objectives of the lesson according to the chosen topic.
- The teacher creates an appropriate classroom environment of enthusiasm, suspense, competition and reinforcement in particular when the groups display the circular shapes they designed.
- The teacher diversifies teaching and visual aids.
- The teacher organizes the learners' knowledge within an effective organizational chart. (2 :20)

The importance of the circular shape strategy to the teacher:

Asma Al-Jenij (2011) mentions that the strategy of the circular shape is of great and essential importance to the teacher for the following reasons:

- It is a tool for good lesson planning.
- It is an interesting and exciting introduction to teaching.
- It is a guide and assistant for the learner to organize his/ her ideas and sequence the scientific material.
- It is a way to identify the learner's misconceptions and work on correcting them.
- It provides a collective learning environment for discussion among learners.
- It is suitable for the application of scientific activities and experiments.
- It shifts the role of the teacher from a lecturer to a facilitator, assistant and listener.
- It helps the teacher diversify educational activities and experiences. (1:167)

The role of the learner according to the circular shape strategy:

Ward and Wanderse (2011) define the role of the learner in the circular shape strategy as follows:

- Determining the goal of building a circular shape strategy.
- Identifying the main ideas to be explored and designing the shape.
- Writing the objectives of the circular shape design at the bottom of the paper on which the shape is drawn.

- Dividing the central idea related to the concept into seven parts increasing or decreasing by two.
- Writing information about each of the identified sectors.
- Drawing icons, lines, symbols or simplified illustrations in each of the specified sectors.
- Filling the parts of the circular shape starting from the twelfth o'clock and in a sequential and brief manner to the main idea. (24: 207)

The researcher sees the necessity of developing systemic thinking among students so that the learner develops a comprehensive perspective of the systems that make up the subject. It also helps the learner analyze them and realize the relationships between them, as well as how these relationships affect each other. In addition, the learner develops a holistic view of the subject that allows him/ her to creatively implement this model later on.

Also, the implementation of educational units using the circular shape strategy in teaching volleyball skills helps to improve learning, which may lead to the improvement of the learners' volleyball skills. This has prompted the researcher to identify the effect of using the circular shape strategy on the level of skill performance of serving from the bottom and serving from the top facing in volleyball.

Purpose of study : -

The study aims to identify the effect of the circular shape strategy on the level of motor performance of the two skills of serving from the bottom and serving from the top facing in volleyball.

Hypotheses of Study : -

- There are statistically significant differences between the mean scores of the pre and post measurements in the motor performance test for the skills of serving from the bottom and serving from the highest facing in volleyball in favor of the post measurement of the control group.
- There are statistically significant differences between the mean scores of the pre and post measurements in the motor performance test for the skills of serving from the bottom and serving from the top facing in volleyball in favor of the post measurement of the experimental group.

- There are statistically significant differences between the post-measurement of the control and experimental groups in the motor performance test of the two skills of serving from the bottom and serving from the top facing in volleyball in favor of the experimental group.

Terminology of study :-

Round shape strategy:

It is a learning strategy for an overall representation of the parts of the skill used and focuses on drawing circular shapes that correspond to the conceptual structure of a specific skill so that the center of the circle represents the skill to be learned and the seven outward sectors represent the component parts of the skill. (procedural definition)

Previous studies :-

- The study conducted by Fathiya bint Ahmad Al-Rawahieh (2016) (11) titled "The Effectiveness of Teaching Using the Circular Shape Strategy in Grammar Acquisition and the Persistence of Learning Effect for Eighth Grade Students in the Authority of Oman." The study sample consists of (74) students. It is divided into two groups: an experimental group of (34) students and a control group of (30) students. The researcher used several data collection methods. These include an instruction manual to improve the learners' achievement using the suggested strategy as well as an achievement test. The use of the circular house shape strategy led to an increase in achievement and sustainability of the learning of the eighth grade students.

- The study conducted by "Ali Khawam Khatib" (2015) (10) titled "The effect of the circular house shape strategy on the kinetic learning of the effectiveness of javelin throwing." To achieve the goal of the study, he used the experimental approach as it suits the nature of the study and the needs of the experiment. The study sample is a group of students from the Faculty of Physical Education in Al Qadisiyah University. The study sample comprises 60 third year students. The research used a number of data collection methods including a content analysis slip, observation and experimentation, in-person interviews, and a fitness test survey. The researcher concluded that the Circular Shape Strategy has a positive effect on the skill of javelin

throwing. He recommends using the Circular Shape Strategy because of its impact on the kinetic learning of the javelin throwing skill.

- The study conducted by Hackney and Ward (2002) (12) titled "The effect of using the circular house strategy in teaching biology to the secondary stage." To implement the study, the researchers used the quasi-experimental approach as it suits the nature of the research. The study sample consists of (30) students, and the study tool was an achievement test for scientific concepts in biology. The study concludes that the use of the Circular Shape Strategy leads to an increase in the students' ability to organize knowledge and realize the relationships between scientific concepts, build sound perceptions of those concepts, and comprehend the relationships between the whole and the part. The research also concludes that understanding increases with the increase of the students' precision performing the skill.

- The study conducted by Ward & Wandersee (2002) (28) titled "The effect of using the circular house strategy on academic achievement in science." To achieve the goal of the research, the researcher used the experimental approach as it suits the nature of the study. The study sample consists of (19) students of the sixth grade. The researchers designed three tools for the study: an achievement test for scientific concepts, an observation card, and in-person interviews with the students of the sample. One of the most important results of the study is the presence of statistically significant differences between the mean scores of the pre measurement test and the average scores of the post measurement test for the experimental group which were taught using the Circular Shape Method. The results also show the importance of linking between the previous expertise of the students and their knowledge concerning the content of the subject and the new information they shall acquire.

Procedures of Study:

Population of Study:

The population of the study comprises 130 students of the second preparatory year at Hamad Town Preparatory

School for Girls for the academic year 2021, and their number is 130 students.

The study sample :

The study was applied to a sample of (40) female students from the second year of middle school in Hamad Town Preparatory School. They were chosen by random method and were divided into two groups, one of them is experimental, comprising 20 students, onto whom the strategy of the circular shape was applied. The traditional orders strategy is applied to the other group, comprising 20 students. The strategy is used in teaching the motor performance of the skills of serving from the bottom and serving from the top facing in volleyball.

Approach of Study:

The researcher uses the experimental method as it suits the nature and objectives of the study.

Data collection tools:

First: Skill Tests

- To test the accuracy of the serve skill from below.
- To test the accuracy of the serve skill from the top facing.

Second: Physical examinations

- Basketball passing test on the wall for 30 seconds
- Hand shooting test on the overlapping circles
- Sitting test from lying down squatting
- Flexibility test of the arms horizontally
- Arms speed test

Research areas:

Spatial domain: All measurements and tests were carried out inside the gymnasium at Hamad Town Preparatory School for Girls - in the Kingdom of Bahrain

Time domain: The academic year 2021/2022

The exploratory study was conducted from 3/10/2021 to 5/10/2021 on 20 female students from the second year of middle school in Hamad Town Preparatory School and from outside the research sample. The objective is as follows:

- To know the appropriateness of the tools used in the lesson.
- To discover the difficulties that may appear during the application of the lessons
- To understand the extent of the students' understanding of the shapes of the circular shape strategy

The basic experiment was conducted in the period from 3/10/2021 to 2/11/2021.

Scientific Transactions for Tests (Validity - Reliability) - Coefficient of validity and reliability of physical tests:

The coefficient of validity equates to 0.86: 0.96. This indicates that the test is valid.

The coefficient of reliability equates to 0.77: 0.98. This indicates the test is reliable.

- Coefficient of validity and reliability of skill tests: -

The validity coefficient of the precision of serving from the bottom equates to 0.92, and the reliability coefficient equates to 0.83.

The validity coefficient of the precision of serving from the top face equates to 0.79 and the reliability coefficient equates to 0.82.

This indicates the validity and reliability of the tests.

Homogeneity of Study Samples (Experimental - Control)

The values of the skew modulus of the age, weight and height variables equate to -0.71: 0.36.

The value of the skew modulus of the physical variables equates to -0.44: 0.46.

The values are limited between -3, +3. Thus, the fall under the equilibrium curve.

This indicates the samples are homogenous.

Equivalence of Study Samples (Experimental - Control)

The value of the tabular T is greater than the T calculated at the level of 0.01 in terms of the age, weight and height, physical and skill variables. This indicates that there are no significant differences. Thus, the study samples are equivalent.

Presentation and discussion of results

Table (1) the significance of the differences between the mean of the pre and post measurements and the percentage of improvement in the skill performance of the transmission skill from the bottom And the skill of serving from the highest confrontation in volleyball for the control group n = 20

Tests	Pre Measurement		Post measurement		The difference between the Coefficients	Values T	degree of potency
	M	S	M	S			
transmitter accuracy test from below	28.60	2.91	32.40	4.71	3.80	4.28**	13.29
Measuring the accuracy of the transmitter skill from the highest facing	24.65	4.32	29.20	4.19	4.55	4.85**	18.46

* Significant at the 0.05 level = 2.09

** Significant at the 0.01 level =2.86

Table 1 shows statistically significant differences between the pre and post measurement mean and the percentage of improvement of level of performance of the serving from the bottom and serving from the top face skills in volleyball in favor of the post measurement.

The researcher credits the percentage of improvement in the results of the control group to the teaching method followed to teach the usual curriculum. The method observes the academic principles in its design, application and implementation in teaching the skill. The repetition of the exercises in the curriculum led to better results.

In this regard, Mahmoud Dawood El Rabeyi and Said Saleh Hamad (2010) state that the traditional method facilitates learning for the learners through verbal explanation,

performance of example, repetition on the learners' part, and correction of errors.

The researcher credits this difference in results to the use of the traditional method using orders. This method depends primarily on the teacher in all its stages. The teacher is responsible for planning, execution and assessment. Thus, the learner's role is negative as he/ she is expected to follow orders and do as asked. **Thus, the first hypothesis is valid.**

Table (2) the significance of the differences between the mean of the pre and post measurements and the percentage of improvement in the skill performance of the skill of serving from the bottom and the skill of serving from the highest facing in volleyball for the experimental group n = 20

Tests Statistic connotations	Pre Measurement		Post Measurement		The difference between the Coefficients	Values T	degree of potency
	M	S	M	S	M		
transmitter accuracy test from below	28.75	2.73	39.60	6.64	10.85	**7.01	37.74
Measuring the accuracy of the transmitter skill from the highest facing	24.90	4.13	34.90	3.85	10.00	**7.98	40.16

* Significant at the 0.05 level = 2.09

** Significant at the 0.01 level =2.86

Table 2 shows statistically significant differences between the pre and post measurement mean and the percentage of improvement of level of performance of the serving from the bottom and serving from the top face skills in volleyball in favor of the post measurement.

The researcher attributes the percentage of improvement using the circular shape strategy to the educational environment and atmosphere, which is characterized by cooperation and participation among members of one group and positive competition between groups and each other, which makes students focus on the technical aspects to perform the skill well and the educational steps and exercises that will lead to the best results and in the shortest possible time.

This is consistent with the results of the study of Tafa Al-Fawara (2019) (23), Elham Shehata (2018) (5), Nasser Ahmed Anis (2018) (21), which all show the excellence of the experimental group that was studied using the circular shape strategy and the presence of a positive effect in learning skills .

This is confirmed by Al-Khatib (2015) that the use of the circular shape strategy had a positive impact on learning the skill and its proficiency, and that the use of the circular shape strategy made learners more enjoyable and interesting to learn the skill, and the student’s construction of the house’s circular house diagram and its distribution of concepts in the central axis and the special sectors of the scheme helped him. On the organization of information and the ability to remember it. (10: 101)

Thus, the second hypothesis is valid.

Discussion of the results of the third hypothesis:

Table (3) the significance of the differences between the mean dimensional measurements of the skill performance of the two skills of serving from the bottom and serving from the top facing in volleyball for the experimental and control groups after the experiment

Tests Statistic connotations	Experimental group n = 20		control group n=20		The difference between the Coefficients	Values T	Difference ratio
	M	S	M	S	M		
transmitter accuracy test from below	39.60	6.64	32.40	4.71	7.20	**4.80	22.22
Measuring the accuracy of the transmitter skill from the highest facing	34.90	3.85	29.20	4.19	5.70	**4.39	19.52

* Significant at the 0.05 level = 2.04

** Significant at the 0.01 level =2.75

The researcher considers that the statistically significant differences between the experimental and control groups in the technical performance of the transmission skills from the bottom, and the transmission from the top facing in volleyball were the result of the positive impact of the proposed program on the experimental group that there is a positive effect of transferring learning in the experimental group. The researcher attributes the reason for the superiority of the experimental group that used the circular shape strategy, which is one of the learning tools. Through the researcher's review of some of the references and scientific studies (3) (7) (17) the importance of using the circular shape strategy in the learning process and its impact on improving the level of skill performance that the learner remembers the organizational forms of the skill better than the traditional method used in learning.

The results of the study of Haya Al-Mazrou (2005) also confirm that the circular shape strategy helps to provide an educational environment that stimulates thinking, and helps the learner to be positive in collecting, organizing, following up and evaluating information during the learning process, and helps develop positive attitudes towards learning. (19: 20)

The researcher believes that the implementation of educational units using the circular house shape strategy in teaching the skills of serving from the bottom and serving from the top facing in volleyball, it helps to learn better, which leads to an improvement in the process of teaching volleyball skills.

Thus, the third hypothesis is valid.

Conclusions:

The researcher has reached the following conclusions:

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1- The use of the circular shape strategy was effective in learning the two skills of serving from the bottom and serving from the top facing in volleyball is proven efficient.

2- The use of the "traditional" command method had an effective effect in learning the skills of serving from the bottom and serving from the top of the game in volleyball is proven efficient.

3- The use of the circular shape strategy for the students of the experimental group was more effective than the method of commands (explanation and presentation) of the control group in teaching the skills of serving from the bottom and serving from the top facing in volleyball is proven efficient.

Recommendations:

After reviewing the previous results, the researcher recommends the following:

1- Using the circular shape strategy in teaching the skill of passing forward and up in volleyball for female students of the Department of Physical Education at the University of Bahrain, as it is proven effective.

2- Diversifying in strategies and methods of teaching skills in volleyball and away from traditional learning.

3- Shedding light on the constructivist learning strategies in teaching basic skills in volleyball in particular and physical education in general so that there are various entrances that can be used in teaching, building curricula and preparing teachers.

4- Conducting some studies and research similar to this study for the rest of the individual and group games.

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