The Effect of Cooperative Learning Using Kagan's Question Cube Strategy on the Acquisition of the Underhand Serving and Overhead Passing Skills, and the Cognitive Achievement in Volleyball for Fifth Grade Primary School Pupils

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Abstract:

The aim of the research is to prepare and apply a teaching method within the cooperative learning approach, using Kagan's strategy of question cubes in the acquisition of the underhand serving and overhead passing skills, as well as the cognitive achievement of the fifth grade pupils at thePort Said Primary School in Maysan province for the academic year 2017-2018. The researcher concluded upon the effectiveness of using this particular method in the acquisition of the underhand serving and overhead passing skills, as well as their cognitive achievement. This method provided stimulators and alternatives which helped the learners gain important information about these skills, apart from the development of creative thinking and cognitive achievement. The researcher concluded that this learning method is better that the traditional one, and recommended that this method should be applied to all other school grades in the teaching of various skills as well as in other lessons.

Keywords: Cooperative Learning, Kagan's Question Cube Strategy, Underhand Serving, Overhead Passing Skills, Cognitive Achievement, Volleyball

1. Introduction

Kinaesthetic learning is considered to be an essential science within the sport specialization, as it is crucial for achieving the best sport performances - whether in team sport or individual sports. This necessitates those in charge of the teaching process to investigate and experiment with the use of active teaching strategies which centeraround the learner, and help him to acknowledge himselfand invest his energy in interacting with others to choose a suitable way to perform. It also requires them to be aware of the characteristics of the learners' age group, and take those traits into account when choosing a suitable teaching strategy in accordance with their experiences, physical and mental abilities, and aptitudes, as these might directly influence their learning of sporting movements and their cognitive achievement.

The purpose behind kinaesthetic learning is to solve the problems faced by the learners and to meet their targets of bringing out the best performance, both tactically and cognitively. According to Bloom's theory, adopting the cooperative learning approach by using Kagan's question cube creates an enriched and varied learning environment which allows the pupils to interact through creative thinking, conscious thinking and discussions. Bloom's taxonomy describes the levels of cognitive skills and focuses on the three areas to create an integrated teaching system, for the levels of learning have to be arranged from the level of knowledge to the level of evaluation. In other words, learners, guided by a teacher who supports their self-directed learning using developed educational tools, have to meet the targets of the lower levels in order to meet the higher ones.

Since volleyball is a team sport practiced and favored by all age groups, especially primary ones, it needs to be further developed by those in charge of the teaching process. Physical education is based on the acquisition of the essential skills both theoretically and in practice, through the correct management of the lesson's time, enabling the learners to interact throughout the learning process. The importance of this research lies in the fact that it is the first of its kind to be applied on PE lessons at primary schools in Iraq using an applied teaching approach likecooperative learning, according to Kagan's question cube strategy in the acquisition of the underhand serving and overhead passing skills, as well as the cognitive achievement in volleyball for fifth grade primary school pupils.

2. Research Method and its Fieldwork Procedure

2.1: Research Method

A method is "a particular way followed by a person to meet a certain target or goal" (Akram, 189). The researcher adopted the experimental method with both pretests and posttests on two compatible groups, for it suits the type of problem to be solved. "The experimental method represents the most genuine approach to solve many scientific problems in a theoretical and practical way" (Al Heela, 217).

2.2 : Research Population and Sample

The research population is represented by (42) fifth grade pupils of the Port Said Primary School in Maysan, section (A). The research sample consists of (32) randomly selected pupils who represent (75,19%) of the research population. These pupils have been divided into two groups of (16) each, one being the control group while the other represents the experimental group.

2.3 : Compatibility of Research Samples

Before applying the prepared research method, The compatibility of the research sample has been tested by the researcher using the pretests on the technical performance of the skills of underhand serving and overhead passing, as shown in table (1):

Table 1

(Shows the compatibility of the research sample)

Variables	Measur.unit	Control Group		Experimental Group		T Value	Percentage error	Signific. Level
		M	SD	M	SD			
Underhand serving test	degree	1.29	0.53	1.55	0.75	0.42	0.89	Random
Overhead passing test	degree	1.02	0.22	1.19	0.79	0.68	0.74	Random
Cognitive achievement test	degree	0.69	0.24	0.82	0.37	0.94	0.88	Random

**Note: Significant at a percentage error of (0.05) if lower than (0.05)*
***Note: Freedom degree = 30, with a max. degree of (10)*

Table (1) shows the differences during the pretest of the technical skills on the research groups, as well as the random significance level of the studied variables, proving the samples' compatibility.

2.4 : Experimental Design

The experimental design helps the researcher to test his hypotheses and enables him to control the experiment when working with two compatible groups, as is shown in the following experimental research design:

Table 2

(Shows the experimental research design)

Group	Pretests		Individual variable	Posttests
Control	Skill performance test	Compatibility of research sample	Teacher's teaching Strategy	Skill performance test
Experimental			Kagan's question cube strategy	

2.5 : Used Instruments and Devices

Data collecting devices:

1. Arabic and foreign references
2. The Worldwide Web
3. Interviews

Used devices:

1. Volleyball court at school
2. Volleyballs (12)
3. Metrical ruler
4. Whistle (2)
5. Coloured tape rolls

6. Statistical devices

Used instruments:

1. Laptop (HP, Chinese)
2. Projector
3. Stopwatch

2.6 : Technical Skill Performance Evaluation:

The research tests took place, and the technical performance of the skills being tested were evaluated directly by a committee of specialized referees.

2.7: Fieldwork Procedure:

The exploratory experiment took place on (06/02/2018), applied on (6) pupils from outside the research sample. The purpose of this experiment is to meet the following goals:

- To check the usability of the instruments and devices used
- To avoid any mistakes that can possibly occur
- To find out the duration of such an experiment
- To be introduced to the staff assisting during the experiment, as well as its workout.

Before starting with the pretests, the researcher gave on (07/02/2018) an introductory presentation(using a projector) to both groups together about the modality of the tests, and the research procedure for the experimental group. The pretests on the research samples took place the next day (08/02/2018). The experimental group applied the method preset by the researcher for the acquisition of both skills of underhand serving and overhead passing in volleyball, over a period of six weeks with two teaching units each. The total number of teaching units has become 10 units of 45 minutes. For each week, the first teaching unit is dedicated to the theoretical aspect, whereat this strategy is applied in the classroom. The second teaching unit tackles the practical aspect of the teaching process, and takes place at the schoolyard.

During the first teaching unit of the week (in the classroom), the researcher adheres to the following steps when adopting Kagan's question cube strategy as part of the preset teaching method:

1. The pupils are divided into four groups of four pupils each.
2. Each group is assigned one of the following colors (red, yellow, blue, green) and is given a piece of cloth accordingly.
3. Each group is given a cube carrying six numbers (one on each side). Each number represents a questions about the technical performance of one of the skills, and these questions are shown on the screen using a projector.
4. The answers to these questions are prepared and placed on the desk, numbered according to the numbers of the cube and the questions shown on the screen.
5. The roles are divided among the pupils within the group according to Bloom's theory. The first pupil rolls the cube. After finding out the number, the second pupil reads the question that belongs to this number as shown on the screen. The third pupil answers the question, and the fourth one checks the answer and corrects it when needed. The pupils switch these rolls until the end of the teaching unit.

The second, practical teaching unit is given to the pupils of the experimental group at the schoolyard. Concerning the control group, the pupils follow their usual learning method as assigned by their teacher-in-charge, which is represented by two practical teaching units both given at the schoolyard. After finishing the principles of the training methods within the assigned period of time, the posttests for both groups of the research sample took place on (11/03/2018).Aiming to commit to the same circumstances of the pretests, the researcher and the assisting staff followed the same procedure in preparingthe testing conditions of place, tools and instruments. The researcher used the SPSS program to process the data related to this research, as well as certain statistical values to process the results in an attempt to meet the targets of the research and realize its hypothesis, namely the (arithmetic) mean, the standard deviation, the percentage error, and the T-test.

3. Analysis and Discussion of Research Results

3.1: Analysis of the Results of the Pretests and Posttests:

Table 3

(Shows the mean, standard deviation and the T value for the control group)

Variables	Measur. unit	Pretest		Posttest		T Value	Percentage error	Signific. Level
		M	SD	M	SD			
Underhand serving test	degree	1.29	0.53	4.25	1.87	6.49	0.002	Significant
Overhead passing test	degree	1.02	0.22	4.21	1.83	8.60	0.000	Significant
Cognitive achievement test	degree	0.69	0.24	3.46	1.32	6.31	0.000	Significant

**Note: Significant at a percentage error of (0.05) if lower than (0.05)*

***Note: Freedom degree = 30, with a max. degree of (10)*

Table (3) shows the results of the pretests and posttests for the control group. The pretests for serving, passing and the cognitive achievement resulted in means of (1.29) (1.02) (0.69), and standard deviation values of (0.53) (0.22) (0.24) respectively, whereas the posttests for the same variables resulted in means of (4.25) (4.21) (3.46), and standard deviation values of (1.87) (1.83) (1.32) respectively. The T-value for these variables equates (6.49) (8.60) (6.31) respectively, and the significance levels are significant at error percentages of (0.002) (0.000) (0.000) when lower than (0.05) at a freedom degree of (15).

Table 4

(Shows the mean, standard deviation and the T value for the experimentalgroup)

Variables	Measur. unit	Pretest		Posttest		T Value	Percentage error	Signific. Level
		M	SD	M	SD			
Underhand serving test	degree	1.55	0.75	6.35	1.77	9.42	0.000	Significant
Overhead passing test	degree	1.19	0.79	7.20	1.89	12.70	0.000	Significant
Cognitive achievement test	degree	0.82	0.37	7.52	1.72	13.34	0.000	Significant

**Note: Significant at a percentage error of (0.05) if lower than (0.05)*
***Note: Freedom degree = 30, with a max. degree of (10)*

Table (4) shows the results of the pretests and posttests for the experimental group. The pretests for serving, passing and the cognitive achievement resulted in means of (1.55) (1.19) (0.82), and standard deviation values of (0.75) (0.79) (0.37) respectively, whereas the posttests for the same variables resulted in means of (6.25) (7.20) (7.52), and standard deviation values of (1.77) (1.89) (1.72) respectively. The T-value for these variables equates (9.42) (12.70) (13.34) respectively, and the significance levels are significant at error percentages of (0.000) (0.000) (0.000) when lower than (0.05) at a freedom degree of (15).

Table 5

(Shows the mean, standard deviation and T value during the posttests for both groups)

Variables	Measur. unit	Control Group		Experimental Group		T Value	Percentage error	Signific. Level
		M	SD	M	SD			
Underhand serving test	degree	4.25	1.87	6.35	1.77	3.21	0.004	Random
Overhead passing test	degree	4.21	1.83	7.20	1.89	4.50	0.000	Random
Cognitive achievement test	degree	3.46	1.32	7.52	1.72	5.73	0.000	Random

**Note: Significant at a percentage error of (0.05) if lower than (0.05)*
***Note: Freedom degree = 30, with a max. degree of (10)*

Table (5) shows the results of the control group and experimental group for the posttests in the skills of serving, passing and cognitive achievement. The T-value for the serving skill equates (3.21) at an error percentage of (0.004), whereas the T-value for the passing skill equates (4.50) at an error percentage of (0.000). The T-value for the cognitive achievement is (5.73) at an error percentage of (0.000). This proves the significance of the differences between the control group and the experimental group, as all values are less than (0.05) at a freedom degree of (30).

3.2: Discussion of Research Results:

By observing the results of the statistical values of the means and standard deviation for the pretests and posttests shown in table (3) and (4), we notice that both of the control group and the experimental group resulted better in the posttests. This eventually proves the influence of the methods used with each of the control group and the experimental one, with a preference for the experimental group. By observing table (5) which shows the results of the posttests for both groups, we notice an improvement in the means of the three variables of the experimental group through their corresponding T-values and significance levels, as a result of adopting Kagan's question cube strategy.

According to the researcher, these differences in the research sample correlate with the effectiveness of the teaching method adopted according to this cooperative strategy. "Fulfilling and acquiring the maximum level of adequacy in the learning process is determined by the teaching method, for it represents a way of organizing the objectives to be taught in gradual steps so that the learner can acquire them easily" (Abdul Fattah, 644). This form of interactive learning increases the pupils' interest and holds their attention for a longer time as they are working out the activities. Interactive learning aims to teach the learner how to learn, how to think, and how to get involved in an activity, through strategies that help the learner to become more active and develop new skills which enable him to adapt to any new changes. This shift them from their passive position to a more active one that encourages them to gain new experiences effectively (Al Yehudi, 78). The results proved that adopting cooperative teaching strategies when teaching these two skills resulted in the quick and effective acquisition of cognitive achievement and an improved performance. Al Heela confirms that the cooperative learning strategy has a great impact on the learners' interaction as well as the harmony among them, which encourages them to work together towards precisely planned targets, as the learners have become interested in their own performance, as well as the performances of their team mates (Al Heela, 351).

4. Conclusions

In light of the research results and their discussion, the researcher concluded the following:

1. The preset teaching method according to Kagan's question cube strategy has a positive and effective influence on the acquisition of the underhand serving and overhead passing skills, as well as the cognitive achievement in volleyball.
2. The experimental group that adopted Kagan's question cube strategy surpassed the control group in regard to the skills tested and their cognitive achievement.

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