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The Effect of Karen's Model with Educational Tools on Female Students' Basketball Scoring Skills

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Abstract: The importance of the research lies in learning peaceful scoring through Karen's model and using the auxiliary tool to teach this skill through motor sense and feeling the target, as well as preparing educational units specific to the model referred to in the research and identifying which of the two groups was better in implementing the units. This research used the experimental method, known for its precision and balance, to solve the research problem, selecting first-year students from Al-Mustansiriyah University. The sample included 15 students each in the experimental and control groups, representing 19.10% of the original 157 students. A pilot experiment involved 5 additional students from outside the sample. The use of Karen's model positively impacts the learning of peaceful scoring skills. Educational tools used with the model enhanced learning outcomes, showing significant improvements in the experimental group. Educational models should be reviewed and prioritized to enhance the learning process. Consider individual differences in understanding concept maps. Use engaging educational exercises with Karen's model to achieve better results, utilizing tools that capture learners' attention.

Keywords: Karen model, the Skill of Peaceful Scoring in Basketball, Educational tools, Learning outcomes

Introduction

The results of some studies have shown that it is impossible to fit the lesson of physical education and sports sciences into a specific mold. Teaching is an art that depends on the teacher themselves, in addition to other factors involved in the teaching and learning process. Therefore, work experience, techniques, and professional preparation cannot be fixed in rigid schedules for the teacher to follow. The success of the educational process depends on the method of implementation. Achieving harmony and integration between the method and the techniques is one of the most important conditions for the success of the educational process, giving the teacher the freedom to convey the material to the learner. The strategy or model is used as a series of sequential steps based on theoretical propositions from various intellectual orientations, including the behavioral theory of learning and the constructivist theory, which help achieve the lesson's objectives. Among the educational models and strategies that have emerged in this field is Karen's model (Kareem, 2019; Tobias-Renstrøm, 2020; Tuntivivat, 2024). Teaching using this model involves procedures taken from multiple teaching models (Lall, 2014; Martin, 2017; Rasmussen, 2017). In Arabic literature, it may be referred to as the Karen Cognitive Learning Model, where the learner is the center of the educational process through discussion, inquiry, and application. The researchers used this model in the learning process to cover the educational material through a concept map to reinforce it among the students, making learning easier for the learner as the information corresponds to each stage of the model (Fong, 2008; Fries, 2004; Roemer, 1987).

Basketball is the second most popular game after soccer in many Arab countries. It is a favorite team sport among many individuals of different levels and age groups. It is a fast, exciting, and entertaining game that relies on developing players' physical, skillful, and tactical aspects. Basketball includes multiple essential skills in both defense and offense, with scoring being the crucial factor between winning and losing. The primary goal that crowns all skills in basketball is scoring, as a team can win the game by scoring more points than the opponent by the end of the match. One of the most important types of scoring in basketball is layup shooting, which is challenging to perform due to the multiple steps involved and its significant impact on the game results. The importance of the research lies in learning layup shooting through Karen's model and using auxiliary tools to teach this skill through motor sense and goal awareness. It also involves determining the ball's paths through visual assessment of distance and multiple steps during execution, ultimately improving the accuracy of layup shooting.

Addressing educational concepts during the development of modern physical education methods and techniques requires reviewing a number of models and methods that give a prominent role to the learner in the educational process (Stein, 2011; Ummel, 1991). As the researchers in the field of teaching, especially in the specialty of teaching methods, noticed, there is no clear attention from the teaching staff to place the learner at the center of attention, consider their opinion, and listen to their thoughts while presenting skills without using any educational tools to facilitate learning for the learner more easily and clearly. Consequently, the researchers observed a decline in the level of some basketball skills, especially the layup shooting skill among first-year female students, as the skill is difficult and requires mental and physical coordination to perform the three steps preceding

the shot. The students lack clear educational experiences and often feel shy about expressing their opinions in front of their peers. This led the researchers to choose Karen's model, which integrates more than one theory and method, making the learner the center of the educational process, fostering continuous interaction between the teacher and the learner. This model supplements what is presented by the subject teacher. Hence, the research problem lies in the need to pay greater attention to modern educational models, including Karen's cognitive learning model.

This research to identify the effect of Karen's model using some educational tools in learning the layup shooting skill in basketball for female students. There are statistically significant differences between the pre-test and post-test results of the experimental and control groups using Karen's model in learning the layup shooting skill in basketball, in favor of the post-tests. There are statistically significant differences between the post-test results of the experimental and control groups using Karen's model in learning the layup shooting skill in basketball, in favor of the experimental group.

Methodology

The experimental method is considered one of the most precise and balanced methods for achieving accurate results. Therefore, the researcher used the experimental method as it is the most suitable for solving the research problem. It is regarded as "one of the most common and widely used research methods in the field of physical education because it relies on two essential elements: observation and experimentation." (Ailan et al., 2002).

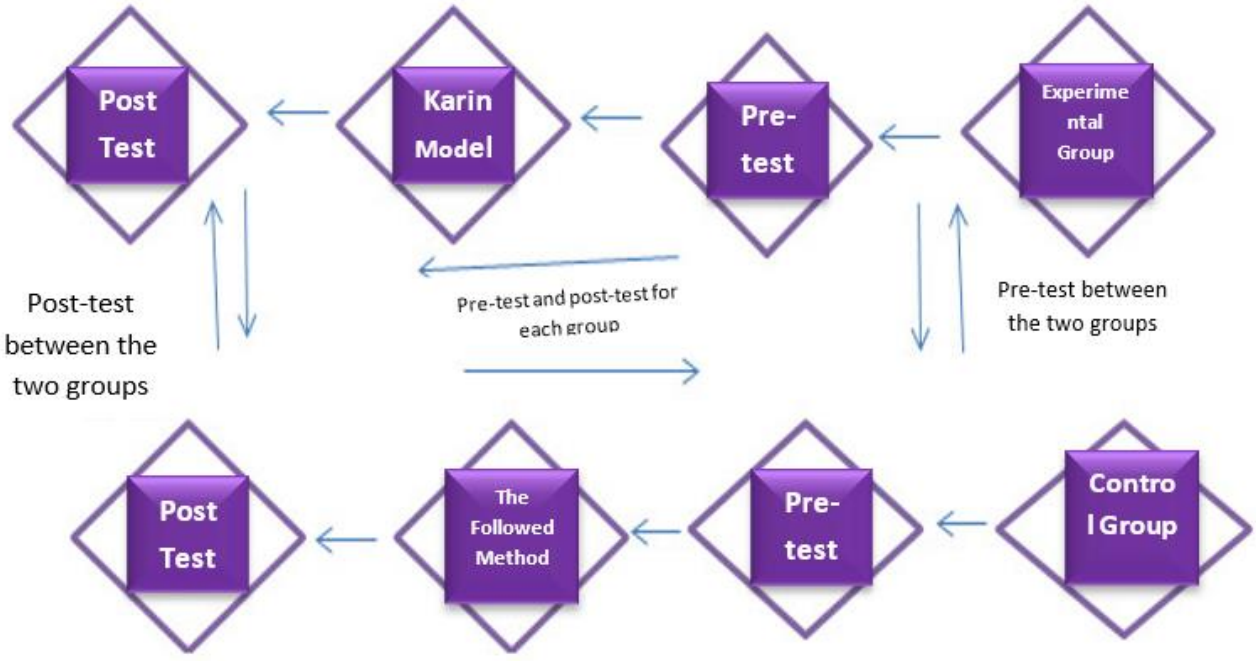

Figure 1. The research flow

The research population was deliberately selected from first-year students at Al-Mustansiriyah University in the College of Basic Education for the academic year 2023-2024,

totaling 157 students distributed across 6 classrooms. The research sample was randomly selected, with Classroom (A) designated as the experimental group consisting of 27 students, and Classroom (D) chosen as the control group consisting of 28 students. Absent and failing students were excluded, resulting in a sample size of 15 students for each group, representing 19.10% of the original population. For the pilot experiment, 5 students were selected from outside the research sample from Classroom (B).

The researcher used the following tools:

- Arabic and foreign sources
- Personal interviews
- Tests used

Devices and Tools:

- Regulation basketball court
- 5 basketballs
- 1 display screen
- 1 educational poster for the skill

Field Research Procedures

Identifying Basketball Skills

Since the skills are part of the curriculum followed at Al-Mustansiriyah University – College of Basic Education, and given that the researchers are faculty members in the field of physical education and sports sciences, it was agreed to select the layup shooting skill as specified in the research problem, on which the experiment was applied.

Identifying the Layup Shooting Skill Test

After identifying the offensive skill, an appropriate test for this skill was chosen. The researchers prepared a questionnaire on skill tests and distributed it to experts with practical experience in teaching methods, basketball, and testing and measurement. After collecting and analyzing the questionnaires, the consensus on the suitable test for the skill was extracted.

Layup Shooting Test:

- **Purpose of the Test:** To measure the accuracy of layup shooting after performing dribbling and shooting from a distance.
- **Required Tools:** Basketball court, basketball hoop, basketballs
- **Number of Attempts:** The player is given 10 attempts
- **Scoring:** One point is awarded for each successful shot, with a maximum score of 10 points.

Pilot Experiment

The researchers conducted a pilot experiment on March 5, 2024, in the indoor hall of the College of Basic Education, Al-Mustansiriyah University, to determine:

1. The difficulty and suitability of the program for the sample.
2. The duration of the skill presentation.
3. The appropriate time for students to ask questions.

Scientific Validity of the Tests Used in the Research

After conducting the pilot experiment, it was necessary to establish the validity, reliability, and objectivity of the test used before applying it to the research sample.

Validity

To ensure the validity of the performance, which means measuring what the research aims to, validity is defined as "the test's ability to measure and evaluate the attribute it was designed for." (Ibrahim, 1987). Content validity was assessed based on expert opinions.

Reliability

Using Pearson's formula on the first and second tests conducted by the researchers, after accounting for similar conditions in both tests as much as possible, it was found that the tests used in the research have a high degree of reliability. The correlation coefficient (r) compared with the tabulated value of (r) at a degree of freedom shows significant correlation and a significance level of 0.05, as shown in Table 1.

Table 1. Shows the Reliability Coefficient for the Layup Shooting Skill

No.	Test	Reliability Coefficient	Significance
1	Layup Shooting Test	0.828	Significant

Objectivity

To assess the objectivity of the test selected for application, the researchers calculated the correlation coefficient between the scores of the first and second judgments. It was found that the values had very high objectivity, with very high objectivity ranging between (0.95 – 1.00). Thus, the tests used are considered to have a high degree of objectivity. Table (2) illustrates this:

Table 2. Shows the Objectivity Coefficient for the Layup Shooting Test

No.	Test	Objectivity Coefficient	Table Value (r)
1	Layup Shooting Test	0.95	0.503

Pre-Test

The pre-test for the research sample was conducted on Wednesday, March 6, 2024. It included a test of the layup shooting skill and was administered in the internal hall of the Department of Physical Education and Sports Sciences, College of Basic Education, Al-Mustansiriya University, by the course instructor and the assisting team. The researchers evaluated the appropriateness of the test conditions for the sample in terms of time, location, and the tools and materials used.

Sample Equivalence

Table 3. Shows the Equivalence Process Between the Experimental and Control Groups

Statistical Tests	Experimental Group	Control Group	t-test Calculated Value	Significance Level (sig)	Difference Significance
Layup Shooting Skill	3.6667 (0.81650)	3.7333 (0.70373)	0.240	0.812	Not Significant

The error rate at the calculated T value is greater than the significance level (0.05), indicating random differences between the experimental and control groups in the layup shooting skill pre-test, reflecting equivalence between the groups. The researchers conducted the equivalence process through the pre-test, and the results of this equivalence for the pre-test group were adopted.

Main Experiment

The researchers began implementing the educational units on Tuesday, March 12, 2024. These units involved learning through the Karen Model by executing the educational stages of this model. The researchers relied on some sources, studies, and scientific research that discussed this model. The teaching methods included using posters, concept maps, and video clips. The skill to be learned was presented to the students after a detailed explanation by the teacher for each stage of the educational unit. The information concerning the layup shooting skill was covered in the practical part, with students applying the skill they were learning.

The number of educational units for the skill was (4) units, one per week, with each educational unit lasting (90 minutes), divided into the following sections:

1. **Preparatory Section:** Duration (20 minutes) per educational unit, consisting of:
   - Introduction: 5 minutes
   - Warm-up: 5 minutes
   - Physical exercises: 10 minutes
2. **Main Section:** Duration (65 minutes), divided into:
   - **Theoretical (Educational) Aspect:** Duration (25 minutes) per educational unit, including:
     - Reviewing information and skills learned in the previous educational unit.
     - Introducing the lesson topic, the skill to be learned, its objectives, and using various instructional aids such as educational posters, diagrams, concept maps, explanatory videos, and standards to help convey the material more clearly. The teacher then poses questions and facilitates discussions.
   - **Practical (Hands-On) Aspect:** Duration (40 minutes) per educational unit, including:
     - Applying what students have learned in the educational aspect through compound and varied exercises that serve the skill being taught, using the teaching approach suited to the model.
3. **Closing Section:** Duration (5 minutes) per educational unit, including recreational activities such as calming exercises or a small game.

Teaching Steps Using the Karen Model

1. **Review of Previous Information:**
   - Review previously learned information and skills.
   - Introduction: The teacher provides an initial overview of the lesson title and objectives to focus the students' attention and prepare them for engagement.
2. **Overall View:**
   - Establish a general organizational framework for the lesson content, facilitating the integration of new information with existing knowledge.
   - Use concept maps, advanced organizers, and diagrams to outline and clarify the lesson.
3. **Strengthening the Cognitive Structure:**
   - Integrate new information into the student's existing cognitive structure through complementary and active learning methods, including inquiry and activities.
   - Record and represent findings through diagrams, concept maps, and tables.
4. **Discussion or Debate:**
   - Discuss and debate results recorded during previous stages with the students, resembling a constructivist learning strategy.
5. **Knowledge Provision:**
   - The teacher summarizes and organizes the ideas and conclusions from previous stages, highlighting relationships between them.
6. **Application:**
   - Students apply new skills individually or in cooperative groups, using the knowledge gained in new learning situations.

The teacher demonstrated the skill to the students in the educational aspect, using a variety of educational activities and tools to achieve the curriculum objectives. This included modern technologies such as computers, display screens, and diagrams to enhance the learning experience.

Note: Each step of the model took (3.5 minutes), except the application step in the practical activity, which lasted (40 minutes).

Post-Tests

After implementing the educational units in the main experiment, the researchers conducted the post-test on Wednesday, April 3, 2024. The post-test included the layup shooting skill test administered to the research sample in the same hall at the College of Basic Education, Al-Mustansiriya University, where the pre-tests were conducted.

Statistical Methods

The statistical data obtained from the tests were processed using the Statistical Package for the Social Sciences (SPSS).

Result and Discussion

Presentation of Mean Scores and Standard Deviations for Pre-Test and Post-Test Results of the Experimental Group

Table 4. Shows the Mean Scores, Standard Deviations, Mean Differences, Error Levels, t-Test Calculated Values, and Significance Levels for the Pre-Test and Post-Test Results of the Experimental Group

Statistical Treatment	Test	Unit of Measurement	Pre-Test	Post-Test	Mean Difference (ΔM)	Error Level (F)	t-Test Calculated Value	Significance Level (sig)	Significance of Differences
	Layup Shooting Skill	Degree	3.666	6.533	2.866	0.4238	6.763	0.000	Significant

Table (4) shows that the mean and standard deviation for the pre-test of the layup shooting skill were (3.666) and (0.816), respectively. In the post-test, the mean and standard deviation were (6.533) and (1.302), respectively. The calculated t-value was (6.763), and the significance level (sig) was (0.000), which is less than the significance level (0.05). This indicates that there are significant differences between the pre-test and post-test results in favor of the post-test for the experimental group.

Presentation of Mean Scores and Standard Deviations for Pre-Test and Post-Test Results of the Control Group

Table 5. Shows the Mean Scores, Standard Deviations, Mean Differences, Error Levels, t-Test Calculated Values, and Significance Levels for the Pre-Test and Post-Test Results of the Control Group

Statistical Treatment	Test	Unit of Measurement	Pre-Test	Post-Test	Mean Difference (ΔM)	Error Level (F)	t-Test Calculated Value	Significance Level (sig)	Significance of Differences
	Layup Shooting Skill	Degree	3.733	4.866	1.133	0.336	3.371	0.005	Significant

Table (5) shows that the mean and standard deviation for the pre-test of the layup shooting skill were (3.733) and (0.703), respectively. In the post-test, the mean and standard deviation were (4.866) and (1.245), respectively. The calculated t-value was (3.371), and the significance level (sig) was (0.005), which is less than the significance level (0.05). This indicates that there are significant differences between the pre-test and post-test results in favor of the post-test for the control group.

Presentation of Mean Scores and Standard Deviations for the Post-Test Between the Experimental and Control Groups

Table 6. Shows the Mean Scores, Standard Deviations, Error Levels, t-Test Calculated Values, and Significance Levels for the Post-Test Results Between the Experimental and Control Groups

Statistical Treatment	Experimental Group	Control Group	t-Test Calculated Value	Significance (sig)	Level	Significance of Differences
Layup Shooting Skill	6.533 (1.302)	4.866 (1.245)	3.582	0.001		Significant

Table (6) shows that the mean and standard deviation for the post-test of the layup shooting skill in the experimental group were (6.533) and (1.302), respectively. For the control group, the mean and standard deviation were (4.866) and (1.245), respectively. The calculated t-value was (3.582), and the significance level (sig) was (0.001), which is less than the significance level (0.05). This indicates that there are significant differences between the two groups in favor of the experimental group.

Discussion of Results

Discussion of the Post-Test Results for the Experimental and Control Groups for Layup Shooting in Basketball

Table (6) reveals significant differences between the post-test results, favoring the experimental group for the layup shooting skill in basketball. The researchers attribute this to the positive effect of the Karen Model used in the educational units, which employed various educational tools to enhance skill demonstration. They argue that the Karen Model is behaviorally oriented and incorporates features that treat teaching as a science, benefiting from psychological learning research findings. This model relies on seven steps that include presenting concept maps, which increased students' engagement and ease in applying the three steps of the skill within the classroom setting. The researchers believe that the use of educational tools improved the learning of the layup shooting skill in the experimental group.

Conclusion

The use of the Karen Model has a positive effect on improving the learning of the layup shooting skill among the research sample. The use of the model along with educational tools had a positive impact on the results of learning the layup shooting skill. The results highlighted significant differences in the experimental group regarding the learning of the skill.

It is essential to explore educational models that enhance the learning process and give greater importance to learning effectiveness. Consider individual differences in understanding the material presented in the form of concept maps for all participants. It is preferable to use educational exercises with the Karen Model to achieve better results, as demonstrated in this study, by employing educational tools that capture the learner's attention to the educational material.

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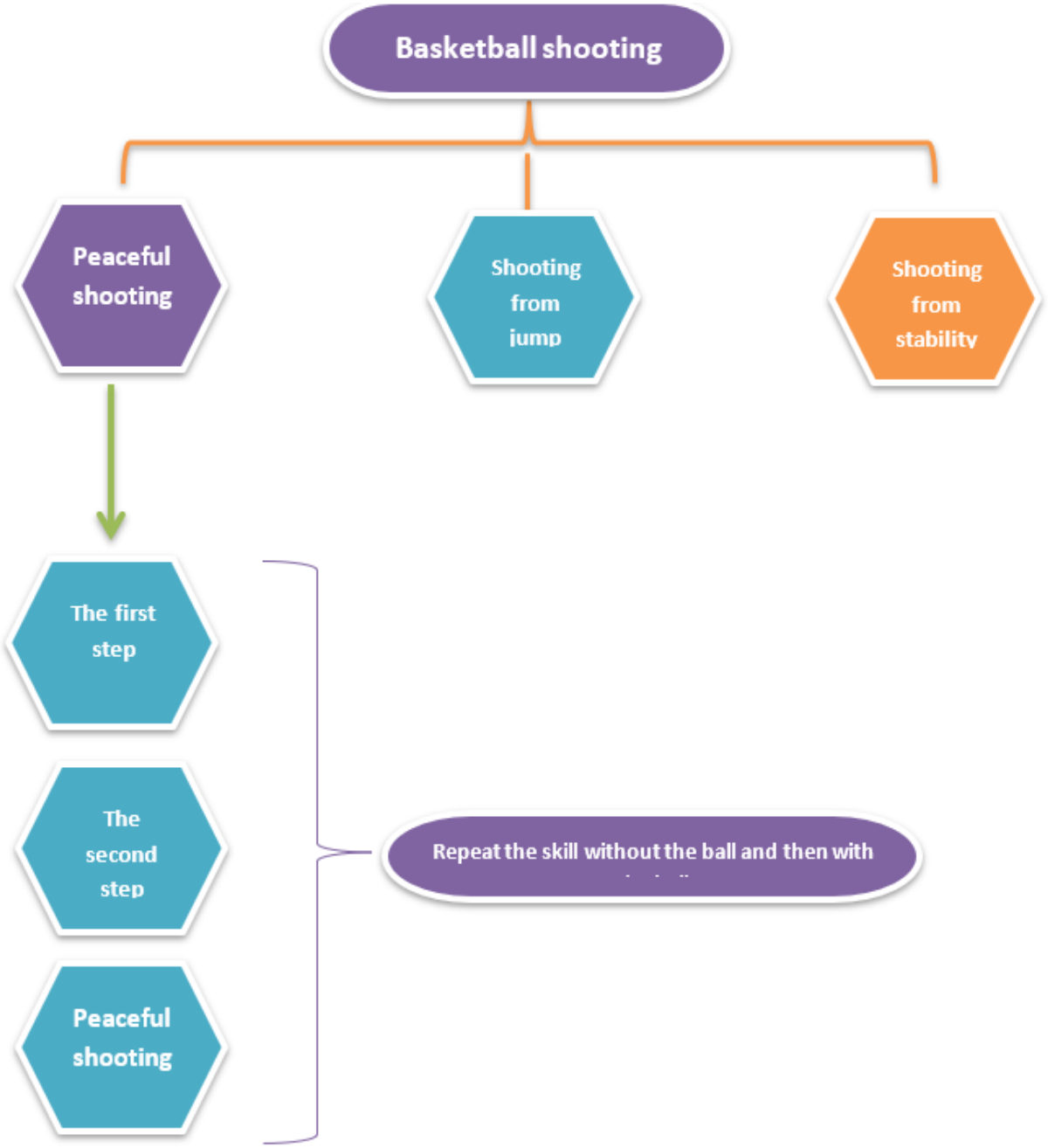
Appendix

Illustrates the Concept Maps for the Skill of Basketball Shooting (Appendix 1).



Appendix (2)

The educational unit for a basketball lesson using Karen's model for the skill of peaceful basketball scoring

(The first educational unit)

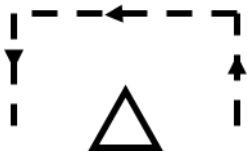
Experimental group / Karen's model. Educational goal: Learn the skill of scoring peacefully in basketball

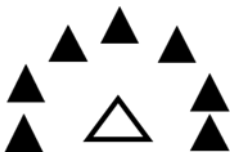
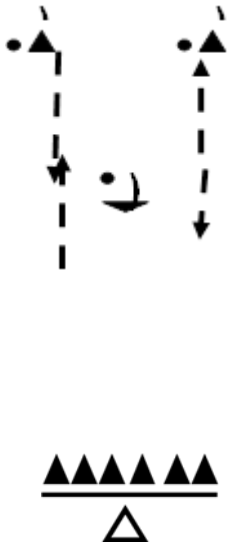
The first week/educational objective/learning commitment and cooperation

Number of students (15): Tools/basketballs, educational poster, signs

Time/90minutes

day and date/( )

Sections of the educational unit	**Time**	**Model steps**	**Activities and skills**	**Formation and organization**	**Notes**
1- Preparatory section a. the introduction B. General warm-up C- Special warm-up	20 D 2 d 8 d 10 D		Preparing tools and taking attendance A general warm-up for all body muscles and preparation of all body systems	XXXXXXXX X XXXXXXXXXX	Ensure that students stand in a regular manner Emphasizing on students performing the exercises correctly
2-Main section A-The educational part	65 D 25 D	1- Review the previous information -Review - Boot 2- The overall view - Concept maps - Advanced organizer - Progressive excellence 3- Strengthening the cognitive structure - Integrative compatibility - Survey 4- Registration 5- Dialogue and discussion 6- Cognitive supply	Educational skill (peaceful scoring with basketball) - The teacher reviews previous information about the scoring skill that was learned in previous lectures - Demonstrating the correct performance of the skill - Presenting the skill using an educational and illustrative poster for the skill that shows the importance and usefulness of the skill The teacher divides the students into		

Sections of the educational unit	Time	Model steps	Activities and skills	Formation and organization	Notes
			small groups consisting of (5) students and asks some questions, for example: - What is scoring and when is it used? - What are the types of scoring? - What is the benefit of performing this skill? Urging students to research and investigate the skill		
B- The applied part 3- Concluding section	40 D 5	7- Application A small game and the end of the lesson	The teacher divides the class into three groups, and each three players form a straight line with a basketball board in front of them. The teacher sets up markers for performing the tap, then the three steps of the peaceful scoring after reaching the last marker and performing the peaceful shot, and so on until the performance is completed for all students in the group.		Emphasis on providing feedback and correcting errors while performing the exercise for the application