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The influence of the project learning strategy on cognitive achievement and the performance of some basic skills in rhythmic gymnastics for female students

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Abstract

The research aimed to: identify the influence of the project's learning strategy on cognitive achievement and the performance of some basic skills in rhythmic gymnastics, and construct a cognitive achievement test for second-year female students in the colleges of physical education and sports sciences. The researcher assumed: There are statistically significant differences between the results of the pre-, post-tests for the experimental, and control groups in cognitive achievement and the performance of some basic skills in rhythmic gymnastics for female students. There are statistically significant differences between the results of the control and experimental research groups in the post-tests in cognitive achievement and the performance of some basic skills in rhythmic gymnastics for female students. The researcher used the experimental method to suit it with the nature of the problem, and the research population was determined intentionally, represented by female students of the second stage - colleges of physical education and sports sciences (Kut University / University of Baghdad) for the academic year (2023-2024), who numbered (144) as a sample. As for the main experiment sample: The main experiment sample consisted of (36) female students from Kut University College, Department of Physical Education and Sports Sciences, from the research community. The sample was divided into two groups, with (18) female students for the experimental group and (18) female students for the control group, and they were chosen. In a random way. The researcher used statistical methods by using the statistical package (SPSS) to extract and transcribe the research results.

Keywords: Cognitive achievement, rhythmic gymnastics, female students

Introduction

The teacher's job is now to design a plan for unit strategies, which includes instructional strategies, means, and learning methods to achieve specific goals, rather than just explaining concepts and imparting knowledge to students. This is because scientific advancements have led to the development of numerous new methods that the teacher can use to help students become highly competent in their chosen fields. A teacher can prepare students in areas of expertise so they are prepared with a high degree of competence by using a variety of new educational tactics.

Modern teaching techniques have evolved, such as the project learning strategy, which depends on the teacher and student's intellectual and practical interaction. The student is given a significant role in the teaching and learning process, and this increases the student's benefit in learning the fundamentals of rhythmic gymnastics, as it forces female teachers to spend the majority of their time learning how to perform. To acquire basic motor abilities, study these skills correctly and give them more of a place in the curriculum. As a result, teaching strategies and strategies in general require attention, particularly those that offer the student a "prominent" role in figuring out the strategies he needs. Learning can be accelerated through a variety of techniques and approaches. The development of motor abilities. Every sports game is unique from the others due to its unique motor performance. It covers the theoretical aspects of cognitive achievement and the corresponding achievement of cognitive goals, as well as representing the physical aspects associated with the movements and skills that achieve the skill aspects. Mental processes, including intelligence, perception, and imagination, are among the fundamental aspects that the learner must possess in order to achieve a balance between the aspects of human formation in general.

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Rhythmic gymnastics is considered one of the movement activities for women, whether they are students, employees, or European workers, because it is in harmony with the natural characteristics of women. This type of sport contributes to the development of movement and physical qualities that directly affect the internal organs. Rhythmic gymnastics also constitutes the basic rule. For all other types of sports, their importance comes because they work to build the entire body and prepare it in the correct preparation for practicing most types of sports, and through repeated learning of some rhythmic gymnastics skills, we can develop muscular strength, muscular and nervous coordination, flexibility, balance, agility, and agility, in addition to improving the figure, in addition to the fact that this activity works to strengthen general health, prolong the life of voluntary exercise, develop the aesthetic sense, and cultivate the desired musical taste. Hence the importance of the research as it is a scientific attempt that the researcher wishes to try by studying the possibility of benefiting from using the project's learning strategy to identify its effect on cognitive achievement and learning some basic skills in gymnastics. Rhythm for female students.

Research problem

Through the researcher's acquaintance, meeting with many female teachers with experience and specialization, and her observation of some rhythmic gymnastics lessons, the reliance in teaching rhythmic gymnastics on the traditional method specific to each teaching method of explaining and learning rhythmic gymnastics skills is not due to poor performance of gymnastics skills necessarily due to the time and effort expended during the course. Education may be due to the strategy used in understanding and teaching the skills of rhythmic gymnastics and their lack of knowledge of retrieving information well during artistic performance, and it may be a reason for not achieving the required learning. From all of this, the idea of the current study was born, which supports those in charge of the teaching process to diversify the use of strategies. And modern methods and methods in the process of teaching modern trends in general and teaching subjects in which teaching activities are transferred from the teacher to the learner and in which the learner is the focus of the educational process, and the role of the teacher is also to guide, advise and organize, in order to fit and be in line with modern trends and the development taking place in the educational process, so it decided The researcher decided to use the learning strategy in the project in an effort to contribute to supporting the teaching process with these effective strategies that support the learning

process of some basic skills in rhythmic gymnastics for female students and develop their cognitive achievement.

Research objectives

- Identify the influence of the project's learning strategy on cognitive achievement and the performance of some basic skills in rhythmic gymnastics.
- Constructing a cognitive achievement test for second-year female students in colleges of physical education and sports sciences.

Research hypotheses

- There are statistically significant differences between the results of the pre- and post-tests for the experimental and control groups in cognitive achievement and the performance of some basic skills in rhythmic gymnastics for female students.
- There are statistically significant differences between the results of the control and experimental research groups in the post-tests in cognitive achievement and the performance of some basic skills in rhythmic gymnastics for female students.

Research methodology

The researcher used the experimental method to suit it with the nature of the problem. The experimental method is defined as "the method that is based on direct and realistic dealing with various phenomena, and is based on two basic pillars: observation and experience of all kinds" (Yasser Dabour and Mohamed Mersal, 1995) ^[1].

Research community and sample

The research population was identified in a deliberate manner, represented by female students of the second stage - colleges of physical education and sports sciences (Kut University / University of Baghdad) for the academic year (2023-2024), who numbered (144). The sample for constructing the achievement test: - The sample for constructing the achievement test consisted of (140) female students from the research population consisted of (35) female students from each university, and Table (1) shows this. The main experiment sample: - The main experiment sample consisted of (36) female students from Kut University College, Department of Physical Education and Sports Sciences, from the research population, and the sample was divided into two groups. There were (18) female students for the experimental group and (18) female students for the control group, and they were chosen randomly (by lottery method), and Table (1) shows this.

Table 1: Shows the research community and sample

No.	University	Total number of sample	Sample exploratory experiments	Percentage %	Sample construction of the achievement test	Percentage %	Main sample
1.	Kut	33	10	2.02	35	7.29	36
2.	Baghdad	111	-	-	35	7.29	-

Methods, devices and tools used in the research

Means, tools and equipment used in the research

Methods used in the research

- Personal interviews
- Arabic and foreign sources and references
- Observation
- The assistant work team

- The questionnaire
- Data dump forms

Tools and devices used in research

- Two (2) electronic stopwatches
- Office tools (Papers, pens)
- Dell personal calculator (1)

- Sony camera
- Camera stand (1)
- CDs

Steps to prepare a cognitive achievement test for some basic skills in rhythmic gymnastics for female students

Determine the objective and scientific material of the test

The goal is to build a cognitive achievement test for some basic skills in rhythmic gymnastics. Then, the scientific material for the research topics of rhythmic gymnastics was determined from the vocabulary of the methodological book (Rhythmic Gymnastics) for second-year female students in the departments and colleges of physical education and sports sciences, which was written by (Amira Abdel Wahed, Shaima Abdel Matar) and the modern gymnastics book, which was written by (Wajih Mahjoub, Asiya Kazem), which was identified by the faculty at Kut University College/Department of Physical Education and Sports Sciences.

Determine the test areas

The test areas were determined by adopting the skills under research that are implicitly within the curriculum prescribed for the second stage of rhythmic gymnastics, which are represented by the skills under current study (Jumps, rotations, walking, rhythmic walking, and waves).

Formulas for paragraphs of the cognitive achievement test

In order to determine the validity of the cognitive test items, the researcher presented the test items in their initial form, which numbered (22) question items in appendix (1), and each item consisted of three alternatives, and the key to the answer was to give one score for the correct answers for each item, and the questions were divided into three axes (The axis Historical - Legal Axis - Skills Axis) where it was agreed with the specialists on all the test items as they are experts and teachers of the subject, as well as in the field of testing and measurement, psychology, teaching methods and rhythmic gymnastics. It was also presented to a group of experts, in order to determine the extent of its suitability in measuring the goal that it was developed for him and a (zero) was given for each incorrect item. The highest score for the test was (22) and the lowest was (Zero).

Preparing test instructions

In order to complete the initial picture of the test and then survey it on a group of 10 students from the evening study in the second stage at Kut University College/Department of Physical Education and Sports Sciences, the researcher developed several instructions showing them the method of answering and the time allotted for her cognitive achievement test. It is as follows

- Write your name, branch, and university on the answer sheet.
- You have (Four) choices for each question. You are required to choose the correct answer.
- Answer all questions, but do not seek help from a colleague.
- The time to answer questions is (15) minutes.
- Do not leave any question unanswered.

An exploratory experiment to test cognitive achievement

It is known that the items of the scale are clear to the test designer, but they may not be clear to the testers. On this basis, an exploratory experiment must be conducted by the

test designer in order to avoid falling into error by the expert. Accordingly, the researcher, after completing the selection of the final items for the test, applied the achievement test. The cognitive study, which consists of (22) items in its initial form, was conducted on a survey sample of (10) female students on Tuesday 9/1/2024 AD. After completing the experiment, the researcher collected data for the sample members and implemented them with tables in preparation for statistical analysis.

The second exploratory experiment

The researcher conducted a second exploratory experiment on Wednesday, January 11, 2024, in the gymnasium hall with a group of (10) female students within the research community outside the (experimental and control) sample. Its purpose was to find out:

- Validity of devices and tools.
- Identify the obstacles and difficulties that the work team may face when conducting tests.
- Identify the ability of the assisting work team and their understanding of the method of work.
- Knowing the time required to implement the tests.
- Determine the height and distance of the camera.
- Knowing the appropriate time to answer the cognitive achievement test items.

Main experiment procedures

Pre-test

Tests and pre-imaging were conducted for the two research groups (Experimental and control), which numbered (36) students, on Monday, February 5, 2024, in the closed gymnasium hall. The researcher carried out the following procedures (a test of cognitive achievement: she distributed cognitive achievement forms to the female students and gave a time (20) minutes. Then I received the questionnaires after the sample answered them. (Filming the performance of the basic skills with a tape tool: An attempt was given for each skill that the student performs, and the attempt was filmed. The student comes, remembers the number (Sequence) and the group (Control, experimental) and performs. Skills in sequence. The student filmed the technical performance evaluations for the best attempt at performing the skills by the nationalists, and their number is 5 evaluators.

The main experience (Implementing the project's learning strategy components)

After conducting pre-tests of the research skills for the two groups, the researcher implemented the prepared educational units on the members of the experimental group, while the members of the control group kept the teaching method followed by the subject teacher. The researcher adopted the steps of the learning strategy in the project, and they are presented in the applied part of the main section of the lesson because of its role in providing continuous feedback to the students. The students were also divided into two groups as an organization and not as a method when applying the steps of the strategy. It included:

- **Project selection:** Special projects have been identified to teach some of the basic skills in rhythmic gymnastics for female students, which are (Jumps with their sides / rotations /walking and rhythmic steps /waves) according to the capabilities that are provided to teach the skills, the booklet, smart devices, and posters

through which the work will be organized. In it according to the correct sequence to learn the skills

- **The project preparation stage:** In which the objectives and competencies expected from the project are determined, in addition to determining the sufficient time period to complete the project, distributing tasks, and determining the necessary requirements.
- **Technical performance completion stage:** In this stage, the skills under research were learned according to the correct sequence of these skills using the means, devices, and tools that were identified in the first step. Continuous feedback will be given while learning the skills under research, with an emphasis on taking into account individual differences and encouraging students to Accomplishing tasks on their own by developing self-reliance in learning and encouraging them to develop knowledge and information for each skill, as well as focusing on continuous repetition of skills in order to avoid mistakes during the teaching and learning process.
- **Evaluation stage:** In this stage, the nature of the results and the extent of achieving the goals set by these educational units will be judged, along with identifying the areas of benefit from them.

After implementing the steps of the above strategy, the researcher prepared (16) educational units, which can be seen in the appendix after which the advice of a number of experts and specialists in the field of rhythmic gymnastics, teaching methods and motor learning was sought. The curriculum items included the following:

- Number of units per week (2) educational units on (Saturday and Wednesday) of each week.
- The duration of implementing the curriculum items is (8) weeks.
- The total number of units is (16).
- The time of the educational unit is (90) minutes.

- The duration of the main section is (70) minutes.
- Applied section time (45 minutes).

The researcher used a method of multiple methods and tools that work to help the students achieve the objectives of the educational unit and make it more interesting and diverse, by using a modern television screen equipped with the Internet, a data show device, and educational means to help increase the students' level of understanding. The main section also included some sudden movements to break Boredom and monotony among students.

Post-tests

On Wednesday, April 1, 2024, at the same time and location as the pre-test steps and measurement of the performance tests for the basic skills of the tape, the post-tests were conducted for the two research groups (control and experimental) following the completion of the implementation of the educational units in accordance with the project's learning strategy. The conditions pertaining to the experiments were established by the researchers. In order to try as much as possible to adopt the same conditions for performing the post-tests, such as the location, time, and manner of implementation, as well as the members of the supporting work team and their roles.

Statistical methods: The search data was processed through the Statistical Package for the Social Sciences (SPSS).

Results and discussion

Presenting and analyzing the results of the cognitive achievement test and some artistic gymnastics skills for the control and experimental research groups.

Presenting and analyzing the results of the pre- and post-tests on cognitive achievement and some artistic gymnastics skills for the control group

Table 2: Shows the arithmetic means, standard deviations, calculated (t) values, and (sig) values in the pre- and post-tests to test cognitive achievement and the performance of some basic skills in rhythmic gymnastics for female students in the control group

Variables	Measuring unit	Pre-test		Post-test		Calculated t value	Sig value	Type of sig
		Mean	Standard deviation	Mean	Standard deviation			
Cognitive achievement	Degree	8.72	0.57	17.27	1.01	34.84	0.000	sig
Some basic skills	Degree	2.88	0.83	5.38	0.60	11.48	0.000	sig

In addition to differences and discrepancies in the standard deviations for these tests, Table (2) displays differences and discrepancies in the arithmetic means between the pre-and post-tests of the cognitive achievement test and some fundamental skills in rhythmic gymnastics for the control group. The researcher used a test (t test) for symmetrical samples to determine the significance of the differences. Based on the test results, it was determined that all test (Sig)

values were smaller than the significance level (0.05), at a degree of freedom (17), indicating the presence of significant differences between the pre- and post-tests and in favor of the post-test.

Presenting and evaluating the experimental group's pre- and post-test findings for the cognitive achievement test as well as some artistic gymnastics skills

Table 3: Displays the arithmetic means, standard deviations, computed (t) values, and (sig) values for the pre- and post-tests on cognitive attainment and the execution of some fundamental abilities in rhythmic gymnastics.

Variables	Measuring unit	Pre-test		Post-test		Calculated t value	Sig value	Type of sig
		Mean	Standard deviation	Mean	Standard deviation			
cognitive achievement	Degree	11.66	1.18	22.66	0.76	30.95	0.000	sig
Some basic skills	degree	2.50	0.51	6.83	0.61	21.88	0.000	sig

Table (3) shows differences and discrepancies in the values of the arithmetic means between the pre- and post-tests of the cognitive achievement test and some basic skills in rhythmic gymnastics for the experimental group, in addition to the presence of differences and discrepancies in the values of the standard deviations for these tests. In order to identify the significance of the differences, the researcher resorted to using a test (t. test) for symmetrical samples, and from its results it was shown that the calculated (Sig) values

for all tests were smaller than the significance level (0.05), at a degree of freedom (17), which indicates the presence of significant differences between the pre- and post-tests and in favor of the post-test.

Presenting the results of the post-tests on achievement and performance of some basic skills in rhythmic gymnastics between the experimental and control groups and analyzing them

Table 4: Shows the arithmetic means, standard deviations, calculated (t) values, and (sig) values in the post-tests on cognitive achievement and the performance of some basic skills in rhythmic gymnastics between the control and experimental groups.

Test	Measuring unit	Control group		Experimental group		Calculated t value	Sig value	Type of sig
		Mean	Standard deviation	Mean	Standard deviation			
Cognitive achievement	Degree	17.27	1.01	22.66	0.76	21.26	0.000	Sig
Some basic skills	Degree	5.38	0.60	6.83	0.61	7.06	0.001	Sig

Table (4) shows differences and discrepancies in the values of the arithmetic means in the post-tests to test cognitive achievement and the performance of some basic skills in rhythmic gymnastics between the control and experimental groups, in addition to the presence of differences and discrepancies in the values of the standard deviations for these tests. In order to identify the significance of the differences, the researcher resorted to use the (t. test) for asymmetric (Independent) samples, and through its results it was found that the (Sig) values are smaller than the

significance level (0.05), at a degree of freedom (34), which indicates the presence of significant differences between in all posttests Between the experimental and control groups and in favor of the experimental group

Presenting and analyzing the results of the percentage of improvement in the post-tests in cognitive achievement and the performance of some basic skills in rhythmic gymnastics for the experimental and control groups

Table 5: Shows the arithmetic means, standard deviations, and percentage of development in the post-tests to test cognitive achievement and the performance of some basic skills in rhythmic gymnastics for the control and experimental groups.

Variables	Measuring unit	Experimental group			Development rate
		Mean	Standard deviation	Mean	
Cognitive achievement	Degree	17.27	1.01	22.66	5,39
Some basic skills	Degree	5.38	0.60	6.83	1,45

Table (5) shows differences and discrepancies in the values of the arithmetic means in the post-tests to test cognitive achievement and the performance of some basic skills in rhythmic gymnastics for the control and experimental groups for the experimental and control groups, in addition to the presence of differences and discrepancies in the values of the standard deviations for these tests, and in order to identify the group that has the most Develop and learn

Discussion of the results

Based on the data displayed in Tables (2-5) for the cognitive achievement test and certain foundational skills in rhythmic gymnastics, Table (2)'s results demonstrated a significant difference between the pre- and post-tests, favoring the post-tests for the control group. The researcher also mentioned Since Schmidt believes that repeated attempts are the important key to performance-converting unexpected movements into predictable and timely movements-the reason for the emergence of these differences is that the teacher's strategy and the number of repetitions it contains have an influence on how the students develop in the variables under study. The sources emphasize that "the many repetitions that the learner practices during practical application help in acquiring learning" (Adel Fadel Ali, 2000) [2].

The researcher credits this growth to the subject teacher's involvement in the repetitions that went along with the

instructional units, as well as to the deliberate selection of simple skills and the use of illustrative methods during the instructional units, as well as to the gradation in the degree of ease and difficulty of the skills and movements that guarantee student performance. "A person who has motor learned a skill has increased motor ability to perform and train this skill because they have mastered it." Al-Hashemi and Al-Dulaimi, Abdul Rahman (2008) [3].

The number of educational units specified in the curriculum, the appropriate repetitions for each educational unit, and the way in which the curriculum is organized to increase skill learning and apply exercises appropriate to the degree of difficulty in the skills while taking into account the students' abilities and avoiding assigning difficult exercises as much as possible are all factors that the researcher attributes to the development of the control group. It considers the individual differences among students, builds the student's confidence by highlighting and supporting some of his well-executed movements, and makes use of feedback-one of the cornerstones of learning, which is necessary to raise the learner's bar-to name a few. "Feedback appears to be the most powerful variable," according to Yarub Khayoun. It has become evident that without it, performance cannot develop since it regulates both learning and performance (Talaat Hassan Abdel Rahim, 1981) [4].

As for the experimental group, the results in Table (3) showed that there were significant differences between the

pre- and post-tests in the variables under research. The researcher attributes these differences in the experimental group to following the new strategy, the effect of which appeared clear in developing the variables under research. The researcher attributes this development to The exercises and repetitions for the selected skills were developed by the researcher in accordance with the strategy, as this included exercises of a gradual nature from easy to difficult and appropriate, as the skill of the front hands jump on the mat, ground movements, requires performing the skill with continuous repetition because the technical errors committed by the learner will be stored in Memory is short-term and needs immediate treatment through repeated performance. Jumping skills need to be graduated with exercises through progression in the motor path of the skill and giving the student an opportunity to think and reach a solution to problems, i.e. transforming the educational process from indoctrination to giving the student an opportunity to expand the horizons of the learner's thinking through questioning while Lesson and comparison in performance, generation of ideas through linking previous and new ideas, prediction, evaluation, and acquisition of skills, in addition to the role of the learning strategy in the project, which focused on the learners' projects through the teacher's question about the skill technique, and the student's answer is in the form of performance, and through comparison between modern and old ideas leads to Predicting the skill technique from the learner and thus giving the student solutions to the problem through performance, after which the decision is made, i.e. performing the skill technique completely. All of this enables them to understand and correct their mistakes in attempts. Although thinking is an internal process, its effects appear in the learner's outward behavior and whenever the learner thinks about the skill. This thinking led to solving problems related to performance, and thus the first hypothesis was fulfilled, which states that there are statistically significant differences between the pre- and post-tests, in the level of learning the basic skills of rhythmic gymnastics among the research sample, and with regard to cognitive achievement as well. The development in it came through the use of This strategy is characterized by an emphasis on the cognitive aspects related to mental processes that have an influence on the development and development of the cognitive and theoretical aspects related to the game under study.

According to the results of Table (4), it was found that there were significant differences in the post-tests between the control and experimental groups in the cognitive achievement test and some rhythmic gymnastics skills, in favor of the experimental group. The researcher attributes the main reason to the effectiveness of the project's learning strategy, which worked to increase information about the skills selected in research, as well as increasing their cognitive achievement, which gives them the desire and excitement to learn more about the things and topics they are interested in, which prompts them to try to consolidate the most important foundations of self-learning. In addition, processing information works to reduce the burden on the different types of memory by The information that the student obtains has a similar meaning because its connection becomes easier and its collection is also easier, and all of this leads to the need for female students at all educational levels to know the methods of processing and mastering

information because this helps them to be creative in the university stage.

Regarding the findings shown in Table (5), which displays the evolution of the post-test scores for the experimental and control groups, it can be observed that the experimental group exhibited greater development and responsiveness than the control group across all research variables. The influence and efficacy of the technique, as well as its appropriateness for the participants in the experimental group, are credited by the researcher as the cause of this. The project's learning strategy, which primarily relied on the idea of motor learning gradation from easy to difficult, was implemented with the help of the curriculum, which helped to develop cognitive achievement and some rhythmic gymnastics skills. This improved learning and developed all research variables. This aligns with the measures put in place with the intention of Because "students do not respond to the learning process in one way and that New and different educational methods must be used to build and develop their abilities and knowledge," the introduction of the new strategy and its diversity led to a positive response from the students in the group. Learning outcomes require attempts to practice exercises, and the most important variable in motor learning is motor practice and the exercise itself (Ali Al-Diri and Ahmed Baniyeh, 1987) [5].

"The learning technique employed in this research makes a significant contribution to centering the educational process around the needs and goals of the learner. Because it is based on higher-order thinking skills, it offers a way to eliminate the negative role that students play in learning how to make decisions and master information (Abdul Rahman Al-Hashemi and Taha Ali Al-Dulaimi, 2008) [3].

Additionally, the questions helped the students understand each component of the skill, which increased their activity level, improved their learning, and ultimately produced positive outcomes for the experimental group. Additionally, it provided the student a part because he could determine the right performance steps based on his responses. Strategies that force the learner to use a variety of mental skills to solve problems and come up with suitable solutions force the student to constantly challenge his thinking abilities and create patterns of thinking, which helps the student learn the skill. When the intellect gives instructions to carry them out, applied talent is the outcome, and anytime they are. The better the applied performance of the skill, the more accurate commands that come from right learning and educational methodologies that are consistent with learning the skill.

Conclusions and recommendations

Conclusions

According to the results that appeared, the researcher reached the following conclusions

- There is an effective influence of the project's learning strategy and the method used on cognitive achievement and the performance of some basic skills in rhythmic gymnastics for female students.
- The use of the project's learning strategy has an effective influence on developing the cognitive achievement and performance of some basic skills in rhythmic gymnastics for female students.
- The project's learning strategy developed the level of cognitive achievement among the students, and it had a

positive influence of using this strategy on the level of the students' cognitive imagination.

- The learner's positivity in acquiring knowledge while learning to employ the learning strategy in the project.

Recommendations

Every research must have a set of recommendations that serve workers, and they are directions for similar research or for conducting other studies, and within the limits of the research results and conclusions drawn up by the researcher, she recommends several recommendations, including:

- Introducing the project learning strategy in teaching male and female students in order to shorten time as well as economize on the tools used.
- Design and build tests for rhythmic gymnastics for female students.
- Paying attention to students' cognitive and mental tests.
- Conducting studies similar to the project's learning strategy on other team and individual games for all educational levels.

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