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## Educational exercises for cognitive overlap and their impact on learning some hoop skills for rhythmic gymnastics

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### Abstract

The aim of the research is to prepare educational exercises for the cognitive overlap to learn some of the hoop skills in rhythmic gymnastics, and the researcher used the experimental approach by designing the two control and experimental groups on the students of the College of Physical Education and Sports Sciences at the University of Baghdad and Al-Mustansiriya, numbering 18 students. Rhythmic at the rate of one educational unit per week for 12 educational units. The exercises are implemented for the experimental group in the main section of the educational unit, and its time is 45 minutes. The results showed the superiority of the experimental group over the control group in the skills studied and recommended the use of cognitive overlapping exercises, especially in rhythmic gymnastics skills.

**Keywords:** Cognitive interference, hoop skills in rhythmic gymnastics

### Introduction

University education is one of the main pillars on which the progress and growth of society is based, because it is the scientific and academic institution that works to develop human resources in society (Abu Hadou and Nofal, 2007: 41) <sup>[1]</sup>. Those involved in the field of learning indicate that the information processing process represents an organized and harmonious series of mental activities start from sensation, passing through perception, attention, and other mental activities. The researchers believe that man is a system that searches for information and organizes it, meaning that he does not waste his time on information that he has previously learned, because the stability of information constitutes a cognitive obstacle.

Hence, it can be emphasized that mental processes are linked and interact with each other until it becomes impossible to imagine a skill in this process in the absence of the other, and these processes in their entirety form the basics of cognitive representation of the world around us. In this regard, we mention the importance of cognitive overlapping exercises for rhythmic gymnastics as one of the activities for women. Since the nature of the rhythmic gymnastics skills are compound skills from the technical and general side of the skill, and the hoop skills are complex skills that need all mental operations to perform their skills in a proper and aesthetic manner, and the student must be attentive and focused on performance and keep away any side thinking that leads to confusion of her learning and performance process. That its educational paths be clear and specific.

The problem of the research lies in the fact that the performance of some students for complex skills when the tools are different, although the skill is fixed and the difference is slight in performance with the change of the tool, and interference occurs due to the nature of the tool. Cognitive as a result of preconceived ideas and judgments about performance by reducing the amount of attention that can be allocated to skillful performance, and some students present skillful performance that is not commensurate with their interactions and responses, and this affects the learning process.

Cognitive effect on the skillful performance of the hoop tool? Hence, the study aimed at building a measure of cognitive interference for rhythmic gymnastics skills, and preparing cognitive interference exercises to learn hoop skills, as well as identifying the impact of cognitive overlapping educational exercises on learning some skills, and identifying the impact of cognitive overlapping educational exercises on learning some gymnastic skills with the hoop tool.

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**Method and Tools**

The researcher used the experimental approach by designing the experimental and control groups with a pre and post-test for third-stage female students in the College of Physical Education and Sports Sciences, Al-Mustansiriya University and the College of Physical Education and Sports Sciences, Baghdad University for Girls / Al-Waziriya. And the sample of the research experiment chose the students of the third stage of the morning study in the College of Physical Education and Sports Sciences, Al-Mustansiriya University, and their number was (25) students. Table (1) that all the values of the torsion coefficient are within (+1 limits), which indicates the homogeneity of the sample As for the research sample for the cognitive interference scale, the third-stage female students at the College of Physical Education and Sports Sciences, University of Baghdad (Al-Waziriya), numbered (90) students distributed over four divisions.

**Table 1:** (++1) Sample homogeneity

Torsion modulus	Standard deviation	Arithmetic mean	Variables
0.107	5.085	158.722	Length
0.244-	4.396	54.833	Mass
0.075	1.263	22.778	Age

**Study tool:** The researcher relied on building a cognitive interference scale, as she formulated a number of paragraphs amounting to (36) paragraphs. 19-36) in a row (Appendix / 1), for the purpose of presenting it to the arbitrators to express their opinions and suggestions about the validity of the scale, and after collecting the forms, the results resulted in an agreement of experts by (85)% on the validity of the scale (Appendix 2). The researcher developed five alternatives to answer in front of each paragraph, namely (It always applies to me, often applies to me, sometimes applies to me, rarely applies to me, never applies to me), and I gave these alternatives grades (5, 4, 3, 2, 1), and thus the highest degree of the scale is (180) degrees, and the lowest Degree (36) with a theoretical average of (108) marks.

**Collar skills:** The researcher relied on four special collar skills for third-stage female students, which are:

1. The skill of rotating the hoop in front of the body above the head in the form (8)
2. The skill of rolling the hoop forward with scissor movement.
3. The skill of inserting the collar with one leg and removing it with the other.
4. The skill of throwing and receiving the hoop with the performance of the step dart

The researcher conducted the exploratory experiment of the cognitive interference scale and the evaluation of the skills under study for the sample of the exploratory experiment, which consisted of 7 female students from outside the research sample, for the purpose of the subsequent research procedures. Then, the pre-tests were carried out on Sunday 10-23-2022 at 10:00 am. The pre-test of the cognitive interferometer was also conducted with the help of the assistant work team. 9:00 a.m. on Sunday, 10-30-2022 to 1-15-2023.

- The duration of the educational exercises is 8 weeks, at the rate of one educational unit per week (Annex 3).

The experimental group carried out the educational exercises prepared by the researcher, while the control group followed the method used by the subject teacher.

The time for educational exercises is 45 minutes in the main section of the educational unit.

The educational exercises of the cognitive overlap were applied in the main section of the educational unit, amounting to (45) minutes in the main section of the educational unit.

The educational exercises for the cognitive overlap were applied in the main section of the educational unit for a period of (45) minutes, and it includes the educational part to explain the skill and the practical application of the exercises with the collar.

After that, the researcher conducted the post-tests at exactly ten o'clock in the morning on Sunday 25-12-2022 in the closed gymnasium for girls, and after completing the skill test, the researcher started testing for the cognitive interferometer.

**Research results**

**Table 2:** It shows the results of the (t-test) test for the correlated samples of the two research groups in the pre and post tests to learn some skills

Statistical significance	Sig	Value (t) calculate calculated	ع ف	ت ف	Post-test		Pretest		groups	Variants
					ع	س	ع	س		
معنوي	0.000	10.176	0.524	5.333	1.236	7.56	0.972	2.22	Experimental	The skill of rotating the hoop in front of the body above the head in the form of (8)
معنوي	0.000	8.018	0.416	3.333	0.928	6.11	0.833	2.78	female officer	
moral	0.000	15.532	0.401	6.222	0.972	8.22	0.707	2.00	Experimental	The skill of rolling the hoop forward with the scissor movement
moral	0.000	7.410	0.465	3.444	0.833	5.78	1.118	2.33	female officer	
Moral	0.000	10.933	0.539	5.889	1.323	8.00	0.928	2.11	Experimental	The skill of inserting the collar with one leg and taking it out with another leg
Moral	0.000	9.141	0.377	3.444	0.707	6.00	0.882	2.56	female officer	
Moral	0.000	15.629	0.377	5.889	0.707	8.33	0.882	2.44	Experimental	The skill of throwing and receiving the hoop with the performance of the step dart
Moral	0.000	8.165	0.408	3.333	0.707	5.67	1.000	2.33	female officer	
Moral	0.000	9.701	10.159	98.556	26.883	149.78	14.359	51.22	Experimental	Cognitive interference test
Moral	0.000	8.418	7.880	66.333	21.751	113.11	9.257	46.78	female officer	

4-1-2 Shows the results of the (t-test) test for the correlated samples of the two research groups in the post-post-tests to

learn some rhythmic gymnastics skills with the hoop tool. Cognitive interference test

**Table 3:** It shows the results of the (t-test) test for the correlated samples of the two research groups in the post-post tests to learn some rhythmic gymnastics skills with the hoop tool. Cognitive interference test

Statistical significance	(Sig)	Value (t) calculate calculated	female officer		Experimental		Variants
			ع	س	ع	س	
Moral	0.013	2.804	0.928	6.11	1.236	7.56	The skill of rotating the hoop in front of the body above the head in the form of (8)
Moral	0.000	5.728	0.833	5.78	0.972	8.22	The skill of rolling the hoop forward with the scissor movement
Moral	0.001	4.000	0.707	6.00	1.323	8.00	The skill of inserting the collar with one leg and taking it out with another leg
Moral	0.000	8.000	0.707	5.67	0.707	8.33	The skill of throwing and receiving the hoop with the performance of the step dart
Moral	0.006	3.181	21.751	113.11	26.883	149.78	Cognitive interference test

Discussing the results: In order to prove the first hypothesis, which states that there are statistically significant differences between the pre and post-tests of the experimental and control groups in the rhythmic gymnastics skills using the hoop tool and the cognitive achievement test, the researcher used the mean difference, the standard error, the standard error ratio, the value of the T-test and the score of six, including It is less than 0.05, then the results are significant, and the researcher attributes that the control group used an appropriate approach to learn the skills with the hoop tool, but the complex skills of the hoop tool with rhythmic gymnastics under discussion need more than that, so we note that the experimental group developed more than the control as a result The exercises used for cognitive overlap that emphasize the interest in the skill itself and the repetition of performance isolating all the influences that may affect the performance, whether they are related to the student from a personal point of view or related to performance. The process of processing information related to processing, retention and retrieval by making cognitive representations and symbols that help the individual leave a mental space Jorkinnd. & Harnish Feger.1996:178) B0.

The ability of students to disengage between stimuli or stimuli that are not related to tasks and stimuli related to tasks and to engage again in related tasks requires the ability to transfer (switch) between these stimuli Monsell, 1996:33<sup>[11]</sup> as well as requires the ability of the learner to implement new tasks despite the presence of proactive This is what the researcher emphasized in her exercises, where she focused on the educational and applied aspect of the skill, repeating the correct performance, and reaching the student to the exact compatibility. Performance and body of the student in terms of skill requirements.

As for the second hypothesis, which states that there are statistically significant differences between the post-post tests of the experimental and control groups in cognitive overlap exercises to learn hoop skills in rhythmic gymnastics, the researcher used the results to show the results, the arithmetic mean, standard deviation, and the calculated t-value. Experimental to the used cognitive overlapping exercises based on the modern view of cognitive psychology is how students employ self-regulation skills and information processing skills represented by thinking and verbal reflection on information before proceeding to retrieve it from a list of information stored in long-term memory (Miller, 2005: 419-421)<sup>[2]</sup>, by helping students develop their abilities and organize their cognitive activities in the teaching and learning processes, in addition to self-awareness, which is a prerequisite for self-regulation, and this in turn makes them more aware of

learning processes and outcomes and their way of thinking as a result of their awareness (Hocky & Geffen, 2004: 591-605)<sup>[12]</sup> and their potential Cognitive, and thus reduce the psychological disorders and pressures that they may be exposed to Which consequently affects the performance of the gymnastic skills that need to be focused on performance. The skill of rotating the hoop in front of the body above the head in the form of an 8 must focus when performing it on the transitions in the skill in terms of performing it in front of the body first and control of the hoop and consistency in raising the hoop above the head and rotation and these details must The student has to know it educationally in the theoretical aspect, then move on to perform it practically, and the student is aware of the details of the skill and its axes, and for this the student needs cognitive overlap exercises, not only for this skill, but for all the skills under discussion, so it is based on the exchange processing of information from top to bottom, and from bottom to top in the impact of concepts and memory on current cognitive processes, expectations, and goals, The frontal system of attention proposed by (Matgorzata & Douglas, 2010: 106-206)<sup>[10]</sup>, and it is located in the frontal lobe, and it is also called the goal-directed system (Corbetta & Shulman, 2002: 201-215)<sup>[14]</sup>. Sensitive to a specific stimulus and is called the stimulus system, and is located in the temporal wall of the brain and is similar to the attention system proposed by Posner & Peterson (1990:25-42)<sup>[13]</sup>, also called the stimulus-directed system and forms the two attentional systems (goal-directed attention system and Attention directed towards moving stimuli) is essential in performing the central executive function, and attention is controlled by balancing these two systems using equal cognitive resources Corbetta & Shulman, 2002: 201-215<sup>[14]</sup>, and that any imbalance between these two systems shifts cognitive resources From the goal-oriented system, and our goal here is to perform the skill well, and this is what the research results achieved.

In conclusion, and through the results of the research, the researcher distinguished between female students who have cognitive overlap in performance and personal cognitive overlap in public life and its impact on performance through the scale. This overlap was addressed through cognitive overlap exercises and showed a positive difference in performance and the validity of the exercises, and through the results the researcher concluded that the cognitive overlapping exercises took into account the individual differences in movement among the students, according to the two pre-posttests and posttests. The results showed that the cognitive overlapping exercises used to teach some collar skills proved to be effective and positive.

**This is why the researcher recommended**

By adopting educational exercises for cognitive overlapping of rhythmic gymnastics skills with other tools and other skills, and adopting cognitive overlapping exercises and doing similar exercises for other games and other age groups, and work with exercises in games that can lead to serious injuries, such as artistic gymnastics and swimming.

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**Appendix (1)**

**Cognitive interference measure**

In the name of God, the most gracious, the most merciful  
Cognitive interference scale in its final form

Dear student. Greetings.

We put in your hands a set of paragraphs that reflect some of the opinions and beliefs that target the researcher through your answer about them to find out your real positions, and because of their great importance to scientific research in particular and to the development of society in general, as you represent an important social segment and an advanced level of science and knowledge.

In view of what we are familiar with in you of objectivity and frankness in expressing your opinions, the researcher hopes for your cooperation with her in answering the collection of these paragraphs in a way that reflects your true opinions towards them, by placing a sign (√) on one of the five alternatives for each of the paragraphs of this scale, noting that there is no There is a right and wrong answer as far as it expresses your true opinions towards it, and there is no need to mention the name. With my sincere thanks and appreciation for your cooperation with us.

Researcher Dr. Elham Ali Hassoun

Never Applies to Me	Applies to Sometimes	apply to Mostly	apply to	Paragraphs always	The sequence	
					I think my preparation for performing the skill was not in the required way	1
					The technical stages of the skill were not understood by me	2
					I get the idea that I can't do the skill	3
					I think that my poor level of performance will affect the level of performance in the exam.	4
					I am not satisfied with my skills	5
					I am concerned about the disappointment I will face when the results of the practical exam are announced	6
					I guess I can't understand the general form of the skill	7
					The idea of repeating the exam bothers me if I fail the subject	8
					I get confused as soon as I feel that the time available to me to perform the skills is not enough to learn the skill	9
					I expect the general form of the skill to be sloppy	10
					I expect the general form of the skill to be sloppy	11
					/Think of my failure on the combined skills test	12
					I am thinking of dropping out of college due to the difficulty of its curriculum	13
					I don't expect to get high marks on the gymnastics exam	14
					I have negative thoughts about what will happen if I fail to do the skill well	15
					I think my ability to understand skills is weak	16
					I am thinking of leaving the tasks assigned to me by the professor in terms of (performing skills and chains).	17



					I get confused when my classmate fails to perform during the lesson	18
					I am worried if the professor's impression of me is negative	19
					Thoughts revolve around my personal problems	20
					Make a lot of effort with motor activities during the lecture	21
					During the practical exam, I have negative thoughts that affect my skills performance	22
					I get preoccupied during the exam with my ability to perform correctly	23
					Controlling overlapping thoughts is a skill technique	24
					I'm busy thinking about the final score for the exam	25
					I get annoyed when someone criticizes me about my ideas in performing the kinetic series	26
					I'm concerned about the way I transfer my motor potential to skills	27
					What I learned earlier about skills comes to mind during the lecture	28
					I expect failure in technical skill	
					I think about the problems that I encountered during the initial stage of learning the skills	30
					I am preoccupied with what makes me sad if I cannot satisfy the teacher in the exam	31
					I often think of failed experiences when linking skills together	32
					Thinking about the exam worries me	33
					Busy thinking about my future after graduation	34
					Preoccupied with thinking about performance more than learning the skill	35
					I expect my teammates to do better than me	36

**Appendix (2)**

Cognitive interaction exercises

Cognitive interaction exercises

A model of cognitive interaction exercises

The academic stage: the second stage, the number of female students: 9 female students, the date: 12/18/2022, the educational unit time: 45 minutes

The educational objective is to teach the students: Rotating the hoop in front of the body above the head in the form of a number 8

The behavioral goal is for the students to perform the skill well

Unit divisions Time Procedures Formations Observations

Preparatory section 20 d

Organizational side

(The introduction)

Warm up

The main department

(Educational part)

15 d At the beginning, explaining the skill from the theoretical side and everything related to it in terms of definitions, how to perform and its mistakes, correcting the mistakes, presenting special pictures of the skill and explaining them in detail, knowing everything related to the skill from the educational side, and trying to separate the performance of the skill by performing the hoop from what the student previously learned with the ball tool and clarifying the performance by different tool x xx x

1- Pay attention to explaining the skill, answering the students' questions, and interacting through questions and answers

(Applied part) 45d - Teaching female students to hold the hoop

▪ Focusing on the right grip for the skill  
Differentiate between holding the hoop and the ball

Focus on toolless performance first

- Performance with the collar II
- Teaching the students to deal with the hard tool, although they learned the skill with a soft tool like a ball previously

- Teaching the students to rotate with the hoop from standing still in front of the body only
- Repeating the skill until it is able to perform it correctly
- Changing direction by performing from right to left and vice versa
- Controlling the performance, emphasizing the correct performance, and trying to reach the performance to the mechanism or the closest to the mechanism, by increasing the repetitions for the correct performance.
- Teaching female students to hold the hoop tool
- Focusing on the right grip for the skill
- Differentiate between holding the hoop and the ball
- Focus on tool less performance first
- Performance with the collar II
- Teaching the students to deal with the hard tool, although they learned the skill with a soft tool like a ball previously
- Teaching the students to rotate with the hoop from standing still in front of the body only
- Repeating the skill until it is able to perform it correctly
- Changing direction by performing from right to left and vice versa
- Controlling the performance, emphasizing the correct performance, and trying to reach the performance to the mechanism or the closest to the mechanism, by increasing the repetitions for the correct performance.
- Moving the performance to the weighted over the head by controlling the performance when moving from the front to the top and the tool does not fall.

**Repetition of the skill until mastery**

- Performing the skill without dividing it in front of the body above the head
- Repetition of the skill without fragmentation until the correct performance is set
- The work of the skill of stability and rotation in place and movement
- Repetition of the performance until we reach the performance the correct
- The closing part is 10 minutes