

# Effect of educational curriculum on coordination and learning of forward and backward rolls on floor mats in female artistic gymnastics

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## ABSTRACT

The primary aim of the present study was to prepare an educational curriculum to improve coordination and learning of forward and backward rolls on floor mats in female artistic gymnastics. The present study had an experimental design. Students of the second stage of the College of Physical Education and Sports Sciences of the University of Kerbala (academic year 2020-2021) constituted the research community for the present study. A total of 54 students, present in the research community, were recruited as the participants of the study. Participants were allocated into two groups, experimental group and control group, by simple random allocation method. Based on the findings of the present study, the researchers concluded that the educational curriculum improved the coordination and learning of forward and backward rolls on floor mats.

## KEYWORDS

Educational curriculum; Female; Artistic gymnastics

## 1. INTRODUCTION

The comprehensive advancement in various countries has also expanded the horizons of the field of the sports and the level of performance of the players in various games. This progress is due to the close interaction of sports sciences among themselves, which led to the continuous change in the methods used in education (Abdulhadi & Abdulhamza, 2022; Yatsenko et al, 2022). Out of the pool of the sports, the game of the artistic gymnastics has attracted great interest of the players, experts in artistic gymnastics, and the audience through the dissemination of the gymnastics game and due to significant development in the level of skill performance. The artistic gymnastics helps in

building physical characteristics that directly affect the vital organs, which leads to improved level of performance in the game.

The learning stage is considered one of the most important stages in the life of the students in which they acquire the basic components of an exemplary skill performance. This facilitates the process of passing through the special stages of the sports (Farhan Hameed, 2022). The movements performed by the female gymnastics is completely different from the movements performed by the female students in other activities and games. The game of artistic gymnastics requires movements to be in great coordination in an organized manner to reach the integrated skill performance. It can be achieved through the use of auxiliary factors that go with the education process. The main goal of the educational process is to increase the ability of the nervous system to control and control the work of the muscles involved in skillful performance for female gymnastics students. Hence the key concern of the researcher was to find the set of exercises that include several stations and factors that accompany the learning process by improving compatibility, and then this can be reflected positively in learning some skills for female gymnastics students (Abd & Nahida, 2008).

Through the researchers' follow-up to the subject of gymnastics, they noticed that most of those who teach gymnastics skills rely on skill-specific mechanisms, without giving key consideration to the compatibility of the training with the physical characteristics of the players along with the lack of preparation of special exercises that help in the educational process for students. Hence the researcher conducted this to find a solution to this problem, to improve the performance of students at the beginning of learning through suggested exercises in improving compatibility and learning front and back roll on the floor movement mat in artistic gymnastics.

The primary aim of the present study was to prepare an educational curriculum to improve coordination and learning of forward and backward rolls on floor mats in female artistic gymnastics. The hypothesis was that the educational curriculum would improve coordination and learning of forward and backward rolls on floor mats in female artistic gymnastics.

## **2. METHODS**

### **2.1. Participants and design**

The present study was conducted on second stage students of the Faculty of Physical Education and Sports Sciences of the University of Kerbala, from November 2020 to May 2021, in the indoor gymnasium of the faculty. A total of 54 students were recruited as the participants of the study. Participants were allocated into two groups, experimental group and control group, by simple

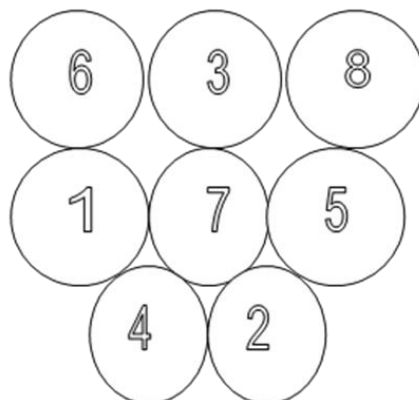
random allocation method. Parity between the two groups was confirmed in the variables affecting the study.

## 2.2. Instruments

In the present study, many tools and devices were used for the purpose of data collection with the aim to achieve the objectives of the research. Tools used in the present study included: measuring tape to determine the height of the students, Sony video camera, camera holder, wooden tables (length 33 cm, height 30 cm, width 10 cm), plastic hoops with a diameter of 40 cm, display device and a calculator.

Extensive review of the technical gymnastics literature was done by the researchers to identify the skills under study in line with the students' education of those skills, which included: coordination, the skill of back-rolling on the floor mat, and the skill of forward rolling on the floor mat.

The coordination test of moving between numbered circles was used to measure the coordination of the legs and eyes. The tools required for the measurement of this test included: Stopwatch, indices, rope to draw circles, draw on the ground of eight circles, each with a diameter of 60 centimeters. The circles are numbered as shown in Figure 1. The tester was asked to stand inside the first circle. After hearing the start signal, the participant was asked to jump with both feet to the second circle, third and fourth circle, one by one, until the participant reached the eighth circle as fast as possible. The total time taken by the participant to complete the whole task was documented (Shalash, 2010).



**Figure 1.** Test of moving between numbered circles

All the basic skills of technical gymnastics for the female participants of the study were determined by the researcher. The researchers used video photography for the purpose of evaluating

the skill performance of the forward and backward rolls. The evaluation degrees were determined for each skill given a maximum of 10 degrees and a minimum of 0 degrees.

### **2.3. Procedures**

The researchers conducted a preliminary experiment to test in the month of January 2021. The preliminary experiment was conducted with the aim to determine the dimensions of the location of the camera (height + distance from the student) when performing video shooting of the basic skills of artistic gymnastics, to verify the validity of the tools used in terms of positive assistance, to verify the fitness of the tests for the tester members and the ease of their application, to know the time required to conduct the tests, to verify the understanding and efficiency of the assistant work team in conducting measurements and tests and recording the results, to know the difficulties that the researcher may encounter during the course of the study and providing appropriate solutions to them.

The research team conducted the pre-tests on the research community, selected as the participants for the study for the study variables. The initial testing was done in the month of February 2021.

The proposed educational curriculum was applied to the participants of the experimental group. A total of 50 participants were allocated in the experimental group. The educational curriculum was applied in two educational units per week for a period of 90 minutes. All the skills were explained to the participants based on their educational field. The explanation was also given regarding the use of educational devices and tools, educational books and learning technology. The curriculum lasted for 8 educational units, as the educational program began on 11 March, 2021, on Sunday, and finished on 20 April, 2021.

Followed by the extensive review of literature regarding kinetic education and learning, a survey was conducted by the researcher to know the opinions of the experts specialized in the field of kinetic learning and artistic gymnastics. The proposed educational curriculum was prepared for teaching third-year students. The general principles of the curriculum included certain key points of consideration. The main objective of preparing the educational field according to creative thinking was to develop the basic skills under study. The scientific hierarchy was taken into account in the priority of teaching the basic skills under study after the experts identified them. The field management system depends on the (stations system), meaning that the student finishes the educational station with all its details and then moves to the other station. The researchers took into account the gradation from easy to difficult, in addition to using the feedback for each station of the proposed educational field. In displaying the skill, the researchers relied on the use of the model as

well as multimedia (video films) to help learners in the process of understanding the details regarding the skills to be performed under the study. The researchers intended that the organization of the stations within the educational field be different from one educational unit to another in terms of sequence, with the stability of the goal to be achieved in order to avoid the boredom that afflicts the learners as a result of the continuous repetition of the routine of the field. The proposed educational field included exercises related to coordination and agility.

In the present study, the curriculum was prepared. Each educational curriculum included 6-8 stations. The period of applying the educational field was 8 educational units at the rate of 2 units per week, and each unit lasted for 90 minutes, including the three sections (preparatory, main and final). The number of repetitions in each station was based on the number of repetitions of the exercise at one time and on the basis of the application time at other times, according to the nature and type of the exercise. In each educational curriculum, 1-2 additional stations were allocated in order to apply the learned skill. With regard to the application of the skill, the performance in the first educational unit is singular, and then the application of the skill is collectively, and feedback is used that I continue, as well as after the completion of the exercise.

After successful accomplishment of teaching all the skills, videography was conducted for the process of evaluation by the panel of experts. The post-test measurement was conducted in the month of May 2021.

## **2.4. Statistical analyses**

In the present study, the statistical analyses were carried out using the Statistical Package for the Social Sciences (SPSS). The following statistical analyses were conducted: arithmetic means, standard deviations and t tests.

## **3. RESULTS**

Table 1 presents a comparison of the pre- and post-tests of the experimental group, Table 2 presents a comparison of the pre- and post-tests of the control group, and Table 3 presents a comparison of the post-tests of the control and experimental groups. The findings presented in these three tables show that the educational curriculum improved the coordination and learning of forward and backward rolls on floor mats.

**Table 1.** Comparison of pre- and post-tests of the experimental group

Variables	Tests	Mean	SD	T value	p
Back rolling skill on the floor mat	Pre	4.32	0.24	7.31	0.000
	Post	5.723	0.42		
Forward rolling skill on the floor mat	Pre	3.62	0.75	10.25	
	Post	7.24	0.65		
Coordination	Pre	8.21	0.645	5.292	0.002
	Post	6.53	0.359		

**Table 2.** Comparison of pre- and post-tests of the control group

Variables	Tests	Mean	SD	T value	p
Back rolling skill on the floor mat	Pre	4.21	0.224	7.11	0.000
	Post	5.71	0.317		
Forward rolling skill on the floor mat	Pre	3.54	0.411	6.51	
	Post	5.61	0.641		
Coordination	Pre	8.13	0.53	3.769	0.013
	Post	7.25	0.435		

**Table 3.** Comparison of post-tests of the control and experimental groups

Variables	Tests	Mean	SD	T value	p
Back rolling skill on the floor mat	Experimental	5.71	0.317	7.40	0.000
	Control	5.722	0.41		
Forward rolling skill on the floor mat	Experimental	5.61	0.641	8.15	
	Control	7.23	0.64		
Coordination	Experimental	6.53	0.359	1.827	0.015

#### 4. DISCUSSION

The researchers attributed many reasons behind the effective learning of front and back roll skills on the floor mats in artistic gymnastics for female students, which included increased frequency and duration of the implementation of the educational curriculum. One of the most important principles of learning is repetition and practice. Accordingly, the female learners (students) were exposed to many exercises in addition to the explanation and clarification of the performance of the skills to be learned. The increased frequency of the exercises and training through several attempts and successive iterations in each educational unit along with the multiple explanation and clarification lead to the formation of motor programs stored in the memory of learners. Quick development of self-interest and motivation occurs when the exercise sessions are associated with encouragement and guidance by the teacher or coach and with his direct supervision (Hamid, 2013).

Significant difference was found in the post test between the experimental and control groups in favor of the experimental group in the special tests in the basic skills under study. Researcher attributed this difference due to the nature of the educational vocabulary, the students were exposed to during the educational units. It was represented by the educational field adopted by the participants of the experimental group. The nature of the field prepared by the researcher included many things that were consistent in achieving the objectives to be taught. The goal of different stations during one educational unit were aimed to teach the skill of that unit by organizing work vocabulary and motor abilities (coordination).

In addition to the educational work, the researcher has also taken into account an increase in motor control and nervous control by identifying the stations of compatibility and agility, when performing the required skills, provided that the nature of the compatibility and agility exercises included in the educational field was related to the skill performance of the desired skill.

It was also observed that the diversity in removing the educational unit from the traditional situation added few important elements to the learning, which included increased suspense, excitement and motives. All of these are the factors and elements must accompany the new learning process in order to increase the individual's willingness to learn. Out of all the field stations, one of the stations was application of the skill with video viewing of that skill. This is extremely important in the formation of detailed kinetic images of the skill performance that are stored in the learner's memory. It contributes to the speed of recalling those images during the application of the skill.

In the control group, the skill performance was found to be developed. The use of the educational field was found to be better in the process of creating motor programs for the participants of the experimental group. It became an integral part of basic components in educational and sports training. Different methods of educational training make the process of kinetic learning or sports training more effective and positive by building the learner's motor perception and development, helping them to attain greatest possible of educational and training adequacy.

A significant difference was found in the post test between the experimental and control groups in favor of the experimental group. The improvement in the motor abilities under study occurred in a balanced and proportional way. The vocabulary of the educational work and the nature of performing exercises for the basic skills that have been learned contributed to the increase of those abilities. The development and improvement in the motor abilities must be balanced both physically and mentally. The nature of the vocabulary of the educational field focused on the actual aspects of the learners through the motor abilities under present study. It was found that the level of development of the members of the experimental group and control group was similar, but the

tangible development in the skill performance of the experimental group can be attributed to many factors, including the use of exercises specific to the motor abilities to serve the skill to be taught.

## 5. CONCLUSIONS

Based on the findings of the present study, the researchers concluded that the educational curriculum improved the coordination and learning of forward and backward rolls on floor mats. The tests showed that the students who used the proposed educational curriculum achieved positive results in the required learning process. According to the set of conclusions adopted and formulated by the researchers from the results obtained in this experiment, it is recommendable that trainers and workers in the field of technical gymnastics increase their interest in developing the educational curricula because of its impact on achieving a high level of learning and skill.

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### **AUTHOR CONTRIBUTIONS**

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

### **CONFLICTS OF INTEREST**

The authors declare no conflict of interest.

### **FUNDING**

This research received no external funding.

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