The Effect of (GYMNASTIC DYNAMORINGS) Device on Some Bio-Kinematic Variables and on Learning the Skill of the Cross on the Ring Device in Gymnastics for Students

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Abstract: the importance of this study by entering into a topic that has an effective role in the use of an assistive device in the field of sports, as this study invented (gymnastic dynamorings device) and trying to reach the ideal mechanical performance in the educational process, as finding this device will help to solve the problem of the mechanics of performing the cross skill speeds up the learning process as well as this study provides all of the elements of suspense, excitement, safety and recovery in effort and time in learning the skill of the cross.

Research objectives

1. Gymnastics Dynamo Ring Device Design for Developing Gymnastics Crossover Abilities for Second Year Students in the School of Physical Education and Exercise Science

2. Understanding the impact of the use of gymnastics ring equipment on the technical performance of gymnastics-movement cross-skills among second-year students in the School of Sport and Exercise Science

Research methodology and field procedures. The researchers used a one-set (experimental) approach and an experimental approach with two measurements (before and after). The researcher adopts the experimental design of a group (experimental) group with two tests (pre-post), because it is suitable for the type of research, selects a branch as the research sample, and uses a simple random method (drawing) method), C represents the experimental group, Of these (23) were students, as the research sample of the study population (25%), which is a standard percentage, the learners were all male, from the same level of Class A and all beginners who had never played gymnastics, except one Because gymnastics is excluded, the total sample (22) is college students. , and use Statistical SPSS pocket to view its statistical data and display research results:

➢ The aid device for the proposed cross skill has a positive effect in improving some bio kinematic variables for the cross skill.

➢ The use of the proposed device saved effort and time for both the teacher and the student in teaching and learning the skill of the cross and had a positive effect on the students' interaction with the lecture.

1 - Definition of research

1-1 Research introduction and its importance:

At present, various fields and aspects of the world are developing extensively, including the field of sports, and a qualitative leap has been made in research and research. In addition to the speed of the learning process, this saves time and effort, as the main and fundamental goal of the skill learning process is to achieve the correct technical performance with as little time and effort as possible, which requires knowledge of the performance variables and mechanics of each activity. aspect to match on-device performance. With the rapid development of games in general and gymnastics in particular, it is necessary to focus on the study of biomechanical variables and find solutions to achieve desired performance, because biomechanics can develop technical performance (skill) levels.

Gymnastic is considered as the corner stone for all other kinds of sports. Because it works to build and setup the players body, through training on gymnastics activities we can develop muscular strength, nervousness, flexibility, balance, agility of the player

Therefore, the importance of this study is to try to achieve the ideal mechanical performance process in education by addressing the topic of effective role in the use of equipment in the field of sports, such as the one invented in this study (gymnastic generator wrestling equipment), because the search The device will help resolve the mechanics of performing cross skills, speed up the learning process, and this study provides all the elements of excitement, excitement, safety, and recovery in terms of effort and time to learn the skills of crossing.

1-2 Research problem

Gymnastics games have many machines, and ring machines have many basic positions from which players start their movements or move through them first to perform other movements. The reason for the multiple positions of this device is due to the type of movement (strength, stability and momentum) contained on it. This creates some problems for the player, the player has to consider enough calculations to calculate the movement of this device, especially (cross-skills).

Therefore, the researchers found through the training process, as they are two specialized players, that there is a difficulty for students in learning the skill of the cross represented by insufficient time and the difficulty of performance because it depends directly on the shoulders and the lack of aids to learn this skill, so the design of a gymnastic dynamorings device was proposed to learn This skill and facilitating its performance for students with high mechanics are suit the ideal performance of the skill.

1-3 Research objectives

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1-4 Research Hypothesis

1. The aid was statistically significant for some biokinetic variables and cross-skill learning in student rhythmic gymnastics.

2. Significant differences between pretest and posttest on some biokinetic variables and students' learning of cross-ability in technical sense.

1-5 Research Areas

➢ Field of Humanities: 2nd degree student at the Faculty of Physical Education and Exercise Sciences, University of Karbala, 2018-2019 academic year

➢ Data field: from 1 | 10 | 2018 to 4 | 1 | 2019

➢ Spatial Area, High School, College of Physical Education and Sports Sciences - Karbala University

2- Research Methods and Field Procedures:

2-1- Research Methodology: -

The researchers used an experimental approach with one set of methods (experiments) and two measurements (before and after)..

2-1-1 Experimental design used in the research

The researchers used an experimental design of one (experimental) group and two tests (before-after) as it suited the type of study, as shown in Figure (1)..

Figure (1).

No.	Group name	Pre-test	Independent variable	Post-test
1	Experimental group	Test the skill of the cross on the rings And measuring bio-cinematic variables	Proposed device	Cross skill test on ring device& var.maesurement

2-2 Research Communities and Samples

1. The researchers identified the research community, which consisted of second-year students of the Faculty of Sport and Exercise Science at the University of Karbala (88) students, divided into four research branches, as shown in Table (1).:

Table.1

The division	A	B	C	D
number	22	21	23	22

Select a branch as a research sample, using simple random method (drawing lots), that is, C, representing the experimental group, of which (23) are students, compared with the research sample of the research community (25%), which is a standard percentage, learners are are male, from the same level and class and all but one are beginners who have never played gymnastics, the total sample is (22) students.

2-2-1 Sample homogeneity and equivalence of study groups: -

Before starting the implementation, the researchers checked the homogeneity of the study sample in terms of biokinematic variables (trunk-arm angle) and measured the ringside crossability performance, as shown in Table (2).

Table (2)

Statistical parameters variables	Measuring unit	Arithmetic mean	median	Standard deviation	Coif. Of variation c.v.
Artistic performance	degree	3.864	4	0.71	18.375
Arm to torso angle	degree	64.772	66	3.531	5.451
Table (2) shows that values of c.v. less than (30).which indicates that the members of research sample are homogeneous in research variables .that means the moderation of normal distribution					

It shows the homogeneity of the study sample in terms of technical performance and anthropometric

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2-3 Approaches, equipment and tools used in the study

2-3-1 Method of collecting information:

1. Observe and experiment.

2. Personal interview.

3. Test of cross skill performance.

4. Technical performance evaluation form.

2-3-2 Equipment and tools used in the study:

1. recommended equipment.

2. Computer type (msi), count (1).

3. Two cameras (NIKON3200) and (EXILIM) speed (720 FPS) for video camera (NIKON) and speed (1000 (FPS) for video camera (EXILIM))

4. Camera Tripod Stand

5. Gym.

6. Two whistles.

7. Length measuring tape (leather), (meters and its parts).

8. Two CDs.

9. Medical weight scale type seca

10. One adhesive tape

11. Chairs and tables, three sets

12. Number of Sportswear (22) no.

2-4 Field Study Program:

2-4-1 Equipment scheme (design ideas and equipment components)

2-4-1-1 Design of the proposed device

After the researchers had the idea of the proposed device, the proposed device was designed in a stereoscopic image and the correct measurements were made in proportion to the lengths of students and arms, and the realistic design of the device was chosen using the 4D Program) and accordingly the device was designed as in Figures (2) and (3).

Figure. (2)(3)

2-4-1-2 components of the device

The device designed by the researchers consists of the following parts:

1. The base: The base consists of four centers ,its dimensions is 2m * 2m in a square from. a square tube that measures 4cm x 4cm with length of 2metrsis used to from the front and the back . but from the sides there is chain of 2m long for each side to install the base

2. The structure of the device: made of a square iron pipe , it consists of two front and back sides in the form of a slanted rectangle with dimensions 3 m x 2 m) connected from the upper side with 4 angles from the top so that it can be closed after completion and opened during work (ease of installation).

3. The player's tie belt consists of synthetic fiber ropes, as shown in figure (4) below

Figure (4)

2-4-2 How to perform it on the device:

The performance on the proposed device is: the player wears the fastening belt tightly and weights are placed in the weight bearing in proportion to the player's ability who holds the ring to reach a support position and then begins by extending the arms to the side to apply the cross skill and can be repeated for several times because the weight carried here is less than the body weight because the weights included in the weight carrier reduce the body weight effect during performance , as shown in Figure (5) below.

Figure (5)

2-4-3 Characterization of the Cross Skill Test:

➢ Test name: Performing the cross skill on the ring apparatus

➢ Purpose of the test: To understand the student's skill level and torso and arm angles.

➢ Performance: The learner performs the skill three times ,the best performance through time and the angle of the torso to the arm ,are chosen

- ➢ Conditions: Return to the main position, leaning on the ring, and then repeat the performance again
- ➢ Registration: It is recorded by three evaluators, the first evaluate the shoulder angle, and the second records the time and the third evaluator checks back to the initial position and ending at the end of the specified angle and the performance score is from (10)

2-4-4 Safety and security of the proposed device:

The researchers demonstrated the device and explained its operation to a group of specialists and specialists (gymnastics and mechanics), who confirmed the possibility of using the proposed device without compromising the safety of students while learning cross-skills, which confirmed research experience.

2-4-5 Advantages of the designed device:

- ➢ light Weight
- ➢ Easy to install and close
- ➢ Facilitates the performance of the skill despite its super difficult
- ➢ Safe for the learner
- ➢ It provides the element of suspense and excitement
- ➢ Control the weights of resistance used by the player, each according to his abilities
- ➢ Prevents injuries

2-4-6 Exploratory Experience:

"Exploratory experiments are one of the most important procedures that researchers perform before starting basic experiments. Thus, the researcher takes responsibility for the negative and positive experiences he may encounter during the test, in order to avoid them in the future, which is considered practical training" (Al-Mandalawi et al., 1989, 107). Researchers in 2017 An exploratory experiment was carried out on a sample out of the study sample at 10.30am on Tuesday 24 January 2009 in the playground of the School of Sport and Exercise Science, an "analogous to the main experiment being a (basic) experiment." (Mahjoub, 2002, p. 42) identified several main objectives:

1. Identify the suitability of the measurements of the proposed device with the physical measurements of students.
2. Ensure the readiness of the tools and the validity of the proposed device.
3. Determine how long each exam will take and how long the exam as a whole will take.
4. Knowing the validity of the proposed device.
5. Determine the effectiveness of the support team(*) in implementing the correct testing methodology.
6. Research sample (level of ease and difficulty of tests).
7. Ensure safety and security measures for the device.
8. Identify errors that may arise from the use of the proposed device.
9. Know the time required to install the proposed device

Results of the pilot experiment

1. The readiness of the device and the tools used have been verified
2. The time taken for each student to perform and the total time for performance were determined
3. The assist staff got acquainted with the duties assigned to them
4. Comprehensive knowledge of the surrounding conditions and the nature of the floor and lighting

2-4-7 pre measurements:

Tuesday 31 January 2017 at 10:30 am After the introductory unit, the researcher took initial measurements on the study sample (22 students) and explained and demonstrated cross-skills and their application to the group.

2-4-8 Exercises

After completing the preliminary measurements, the researcher entered the exercises associated with the proposed equipment, and the researcher added the equipment to the educational program of the experimental study sample in the main part of the educational unit as the researcher became proficient in performing the exercises, thus becoming the following calculate**:**

1. The date of starting the exercises was on (Tuesday) 21/2/2017.

2. Exercises were applied in the main part.

3. The duration of the experiment was (8) weeks, divided into one session per week, the exercises were fixed (repeated) for three sessions, and then the researchers varied the exercises used in subsequent sessions.

4. The researchers performed special exercises designed for them in the main part of the Gymnasium/Faculty of Sports and Exercise Sciences/University of Karbala to control for external factors affecting the functionality of the equipment used, and the samples were not exposed to any different procedures or additional training method.

5. As the time for the educational units was every Tuesday at 10:30 in the morning.

6. The same exercise was used by researchers in the experimental group as part of a course, except that the device exists as a teaching tool.

7. The time for carrying out the exercises was about (200) minutes.

8. The end of the experiment was on (Tuesday) 4/11/2017

2-4-9 the main experiment:

After completing the procedure that qualifies the researchers for the main experiments, the researchers apply the proposed device to the experimental groups.

1. The experimental group spent 8 weeks implementing the device and working on it at a rate of one unit per week.

2. The implementation of the first unit has started on Tuesday 21/2/2017.

3. The last unit was on Tuesday, 11/4/2017.

2-4-10 post measurements:

After the implementation (8 units), the device was applied and edited by the experimental group. The post-measurement of the experimental group was carried out in the gymnasium of the Faculty of Sport and Exercise Science, University of Karbala, under the same conditions as the pre-measurement on April 18, 2017, in the presence of supervisors and evaluators and assistant working groups.

2-5 statistical methods

The researchers selected statistical methods related to the comparison of the before and after measurements of the experimental groups and used the Statistical Processing Program (SPSS), which reads as follows:

➢ Arithmetic mean.

➢ standard deviation.

➢ Coefficient of variation.

➢ (T) Testing of cross-linked samples.

3 - Presentation, analysis and discussion of results:-

3-1 Presentation and analysis of skill performance measurements of the cross-skill ring device for experimental research groups and discussions.

3-1-1 Presentation and analysis of the difference in measurement results before and after the cross-skill performance of the ring instrument conducted and discussed by the experimental group: -

In order to determine the significance of the difference between the before and after measures of the cross-skill skill performance levels of the members of the experimental group on the ring instrument, the researchers used the (t) test as the statistical method for this purpose and the study variables were presented in the before and after measures and in Table (3) authenticity of the difference.

Table (3)

Shown are the arithmetic mean, standard deviation, value of the test (t) and its statistical significance for (before and after) the cross-skill performance of the experimental group on the ring instrument

test	pre		post		T Calculated value	Indication level	Indication type
	x	y	x	y	9.514	0.00	moral
Skilful performance	3.864	0.71	6.136	0.71			

Because the results show that the arithmetic mean of the posttest is greater than that of the pretest, there is a significant change between the two measurements in favor of the posttest because they show a level less than (0.05) as shown in Table No. (3). By using (t) for related samples, this level of significance indicates that there is a significant difference between before and after measurements.

Discussion:

By looking at Table (3), we can clearly see that there is a clear difference in the results of the two measurements (before and after the measurement) when proficiently performing the cross-skill on the ring device, which favors the post-measurement of the experimental group because The researchers attribute this development of dexterous performance in the experimental group to the dexterous performance of the proposed device, as well as the educational program they constructed for the device based on scientific principles, which facilitated the development of dexterity through practice and clear kinematic processes. Occurs due to the flexibility of the proposed equipment and its important role in providing support and a sense of security to the experimental group, which is what many experts say, that reaching the advanced level of sporting events involves a comprehensive set of procedures, based on scientific foundations and rules , educating and preparing students saves time and effort and reduces mistakes and injuries, as he agrees (Al-Bashtawi and Khawaja, 2005, p. 212).k (8 weeks). There are several appropriate scientific approaches to learning kinesiology skills in order to achieve higher athletic levels, and there are many aspects of science that PE students should be individually familiar with. Include assistive equipment, as the researchers designed the equipment to match the form and nature of the performance, to prepare what is necessary to learn the skill during training, as the specific travel limits of the arm during the learning process. Help students improve performance and eliminate fear of performance, increase excitement and control movements with assistive weights as it saves time for easy repetitions.

Therefore, by using this proposed device, we can save the energy of the learners based on their anthropometric measurements, and the researchers also see that the proposed device saves time, leading to high iterative performance, with great impact on learning motor skills process had a large effect, and the sample consisted of students who had never practiced gymnastics, this improvement occurred due to the need for repetition in the education process to acquire motor form and ability to think, which is consistent with (Youssef and Salah , 2014, p. 82) agree: "Training and practice in response to stimuli leads to an increase in the number of repetitions leading to an acceleration of appropriate decision-making and a decrease in reaction time. for the desired movement."

3-1-2 Presentation and analysis and discussion of before and after measurements of biokinetic variables of skill performance of experimental group members cross dexterity on the ring system:-

In order to determine the significance of the difference in the level of cross-skill performance on the ring system of members of the experimental group by the before and after measurements of the biokinetic variable, the researchers used the (t) test as a statistical method for this purpose to find out the before and after measurements of the study variable The truth of the difference is shown in Table (4).

Table (4) shows the arithmetic mean, standard deviation, value of the test (t) and its statistical significance of the two measurements (before and after) of the cross-skill biokinematic variables of the experimental group Kinematic on the ring device

	measuring unit	pre		post		T calculated	Indication level	Indication type
		x	y	x	y			
The angle of the torso with the arm	degree	64.772	3.531	76.682	1.673	13.886	0.000	moral

At the significance level (0.05) and degrees of freedom 21

Table (4) shows the statistical indicators of the before and after measurement results of the biokinetic variables of the performance of cross dexterity skills on the ring machine performed by members of the experimental group, because the results show that: the difference between the post-test value and the arithmetic mean is greater than the pre-test value, and the two Significant variation between sub-measurements favors post-measurement values. Therefore, this is the significance level indicated by using (t) for the relevant samples, since they are less than the significance level (0.05), indicating a significant difference between the two measures.

Discussion:

By looking at Table (4), it can be clearly seen that there is a statistically significant difference between the two measurements of the kinematic variables (before and after) of the lateral skill performance of the experimental group on the ring device. As the researchers attribute this development to the skill of the equipment used, it is constructed according to scientific principles, and the exercises prepared by the researchers for the equipment serve their purpose, gradually from easy to difficult, And explain and use Demonstrate the skills to students in a simple way, and then demonstrate the movements of the skills on the equipment to emphasize the straightening of the arms and the inward rotation of the ring during execution, and also create spatial feedback for students to correct mistakes and practice synchronously given, because the researcher quickly proves and corrects errors by the presence (corresponding to the type and shape of the equipment of the movement, through the presence of several factors, namely the weight as an aid, the excitement, the tension element performance, the shape of the equipment, corresponding to The physical measurements and weight of the study samples are characterized by the diversity of learning tasks according to age groups and ease of learning when using equipment. This has been emphasized (Faraj, 2007, p. 223).

"((The process of perfect training must be an important factor for the success of any sport. The coach or teacher must consider not only speed, elevation and distance, direction, but also the period of performance and his adaptability to age. His or her level of performance, and an accurate description.

Each skill exposes the learner to the \u200b\u200bprinciple of movement)). Researchers believe repetition has a strong influence on the ability to learn kinematic movements. while the study sample never engaged in this type of physical activity.

This improvement, therefore, is due to repetition leading to the acquisition of motor form and thinking skills during the educational process, which is confirmed (Shalash and Sobhi, 2000, p. 129): "Practice and effort in training and constant repetition are necessary During the training process, training is a necessary and supporting factor in the process by which the individual interacts with the skill, controls movement and coordinates movement, resulting in the performance of skills in the correct sequence at the right time.Only continuous training can improve skills and mastery.

Conclusions and recommendations

4.1 Conclusions

Given the findings of the study and the statistical processing of the data obtained in the skill performance assessment and kinematic analysis of the ring device, the researchers concluded the following: -

1. Perfect execution of skills according to biokinematic variables, accelerating the process of skill mastery and allowing no technical errors in execution.

2. The proposal device provided a percentage increase in repetitions for each student.

3. The proposed cross skill aid device has effectively contributed to learning the cross skill.

4. It is clear that a development in the values of some kinematic variables during the preparation phase of the research sample (post-test) when compared to the values of the pre-test

5. The aid device for the proposed cross skill has a positive effect in improving some bio kinematic variables for the cross skill.

6. That the auxiliary device for cross skill gave students self-confidence and the desire to perform by overcoming the fear factor of incorrect performance in learning to perform the cross skill.

7. The use of the proposed device saved effort and time for both the teacher and the student in teaching and learning the skill of the cross and had a positive effect on the students' interaction with the lecture.

4.2 Recommendations

The researchers recommend the following:

1. Using the aid device for the cross skill in the process of teaching beginners in that skill.

2. Conduct a similar study to find out the impact of assistive devices on learning other fundamental skills in gymnastics and other physical activities.

3. Design and manufacture of suggested assistive devices from simple materials available in the local markets to teach various sports skills.

4. Disseminate the proposed equipment first to the Faculty of Physical Education and Exercise Science and then to the Sports Institute. Used when teaching cross-skills in Iraq and abroad

5. Taking into account the psychological state of the student that accompanies the use of assistive devices in the educational process.

6. Emphasizing on the correct construction of students in the stages of teaching them basic skills for various sporting events.

7. Emphasis on making methods of teaching aligned with the requirements of the learner and his abilities, and that some means may be sufficient to facilitate the learning process.

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