Vol 2 Issue 4 Thi Qar University Journal of Physical Education

مجلة جامعة ذي قار لعلوم التربية البدنية

مجلة علمية محكمة تصدرها كلية التربية البدنية وعلوم الرياضة

The Effect of a Proposed STEAM Instructional Design on Learning Some Basic Skills in Artistic Gymnastics Preparation

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Published online:
20/ 12/2025

Keywords:
Tutorial Design, STEAM Orientation, Basic Skills. Artistic gymnastics

ABSTRACT

The present research aimed to propose an educational design according to the STEAM approach in learning some basic skills in artistic gymnastics and to show the importance of the effect of the proposed educational program.The research problem was addressed by the researchers, through their field experience, that learners suffer from weakness in learning artistic gymnastics skills because they need special requirements and do not have enough experience, as well as the differences in the age of learners, they need to diversify their teaching methods, find educational alternatives, use modern technologies, as well as pay attention to the factor of individual differences. The research sample included the players of the junior gymnastics team aged (11-13) years, who numbered (14) players. They were divided into two experimental groups and a control group of (7) players, and the experimental method was used, and the researchers applied the proposed instructional design according to the STEAM approach in learning some basic skills in artistic gymnastics on the experimental group, and through the results, the researchers concluded that the proposed instructional design has a positive effect with statistical significance In learning some basic skills in artistic gymnastics, the researchers recommended the need to emphasize the dissemination of the results of the current research in order to benefit from it in the preparation of educational programs and other events.

Importance of the research:

STEM-oriented education requires developing the abilities of players on the skills of integrating different skills while creating modern learning environments to support learners and enjoy them during their work in teams to reach meaningful and useful results, and to realize and understand the connection between different skills smoothly and easily to prepare them for requirements and challenges similar to the conditions of competitions, as gymnastics events differ from other types of sports in their physical and mental requirements for what they need in a distinctive preparation during learning skills, as well as requiring compatibility. Mental and motor as well as the stages that these movements go through in terms of their sequence and the difficulty of the growing movement in them in the various stages of their learning, which are described as closed skills, hence the importance of the current research in preparing a proposed instructional design according to the STEAM approach in learning some basic skills in artistic gymnastics.

Research Problem:

. The researchers have noticed through their field experience that learners suffer from weakness in learning artistic gymnastics skills as they need special requirements and do not have enough experience, as well as the differences in the ages of learners, they need to diversify their teaching methods, find educational alternatives, and use modern technologies, as well as pay attention to the factor of individual differences, so we as researchers must reach attractive strategies that achieve the required comprehensiveness and integration that we seek to achieve through the diversity of methods and strategies, their development and integrative integration in a simplified way. And comprehensive.

Research Objectives:

1. A proposed STEAM instructional design in learning some basic skills in artistic gymnastics.
2. Knowing the effect of the proposed STEAM educational program on learning some basic skills in artistic gymnastics.

Research Hypotheses:

- There are statistically significant differences between the results of the pre- and post-tests of the two groups and in favor of the post-tests.
- There are statistically significant differences between the results of the post-tests of the experimental and control groups and in favor of the experimental group.

Research Areas:

- **Human field:** Junior gymnastics team players aged (11-13) years.
- **Temporal Domain** : Period from 10/2/2024 to 22/5/2024.
- **Spatial Field** : The hall of the Training Center of the Gymnastics Federation.

2- From the research and its field procedures:

2-1 Research Methodology: The experimental method was used in the method of two equal groups to suit the nature of the research problem.

2-2 Research Sample: The sample was selected from the players of the junior gymnastics team aged (11-13) years, and they were selected by the deliberate method as the vocabulary of the stages of basic skills in artistic gymnastics is given according to the program of the technical committee of the International Gymnastics Federation in the sequence of giving skills, and the players who are under these ages and qualified to perform these skills were selected and the number of (14) players was selected. After that, the test values were arranged from the lowest to the highest for the purpose of dividing them into two groups by means of odd numbers in a group and even In another group, each group contained (7) players. For the purpose of avoiding factors that affect the results of the experiment, the research sample was equalized

Table (1) shows the homogeneity and parity of the members of the research sample

Testing the Differences	Torsion coefficient	Experimental Group		Torsion coefficient	Control Group		Unit of Measurement	Measurements	t
		on	Going to		on	Going to			
0.05	0.015	0.314	147	0.331	0.658	141	Poison	Length	1
0.07	0.045	0.556	42	0.425	0.691	39	kg	Weight	2
0.27	0.090	0.881	149	0.697	0.938	154	month	Age	3
0.001	0.091	0.561	7.123	0.087	0.653	6.887	Degree	Motor sentence	4

* At a degree of freedom (12) and a significance level of (0.05).

2.3 **Means of data collection:**

2.3.1Devices and instruments: throat device, projector, camera camera.

2.4 **Field research procedures**

3.4.1 Skill tests and motor sentences under discussion:

Test Name: Attachment (Inverted and then Suppressed)

Purpose of the test: To measure the player's ability to perform two skills (inverted and then repressed).

Tools Used: Shaving Device/Magnesium

Performance Specifications : The player takes the standby mode and then performs the skill (inverted and then repressed).

Registration: My skills (upside down and then cap) have been evaluated by a committee of judges, and it was agreed that the final grade will be (10) grades.

Test Name: Landing Roller Backflip.

Purpose of the test: To measure the player's ability to perform the backflip somersault for landing.

Tools Used: Shaving Device/Magnesium

Performance Specifications : The player takes the standby mode and then performs the skill of the backflip somersault for landing.

Registration: The skill of the backflip somersault for landing has been evaluated by a committee of judges, and it was agreed that the final score should be (10) marks.

Test Name: Grounding Hip Test, Lowering Body Forward of Anchor Angle

Purpose of the test: Measuring the player's ability to lower the body forward from the angular pivot and then the squeeze to the pivot.

Tools Used: Shaving Device/Magnesium

Performance Specifications : The player takes a standby position, then lowers the body forward from the corner pivot and then the repression to the center.

Registration: The performance has been evaluated by a committee of judges, and it has been agreed that the final score will be (10) marks.

2-5 Pre-Test:

The pre-test for the experimental and control research groups was conducted at twelve o'clock on Wednesday, 17/2/2024, in the hall of the training center of the Gymnastics Federation.

Implementation of the proposed educational program:

The proposed educational program included (12) educational units and (90) minutes per week for the experimental group, and the steps of preparing the

educationalmodules prepared by the researchers for the experimental group consisted of the following:

- Identify the learner's level and mental preparations
- Determine the type of skill and performance required of the learner.
- Identify the steps needed to perform in order to achieve the end goal.
- Breaking down each skill into small steps that make up it so that the learner can perform it
- Immediate knowledge of the result of the skill performance of motor sentences by the learner.
- Walk in learning according to the learner's personal ability.
- Relying on the learner's self-assessment.
- Evaluate the player's performance directly from time to time. The proposed educational program prepared by the researchers and the curriculum followed by the coach has been applied.

2-6 Post-Test:

The post-test was conducted on 22/5/2024 at ten o'clock, as the researchers were keen to create the conditions for the choice in terms of time and place, the same assistant work team in the pre- and post-tests, tools and devices in order to stabilize the variables as much as possible.

2-7 Performance Evaluation :

A group of assessors specialized in artistic gymnastics was relied on to evaluate the skill performance of the motor sentences of each player from the research sample when performing the motor sentences on the throat device in artistic gymnastics, for the purpose of extracting the final evaluation score.

2-8 Statistical Methods :

The researchers used the SPSS statistical package to extract and discuss the research results

4. Present, analyze and discuss the results:

Table (2)

Shows the results of the pre- and post-tests of the experimental group

Significance Level	T calculated	Average spreads	Post-testing		Pre-test		Unit of Measurement	Motor sentence
			on	Going to	on	Going to		
D	3.22	2.102	0.543	9.225	0.561	7.123	Degree	Weighted, Inverted Suspension, Depression Suspension, Angular Pivot Depression, Angled Pivot Body Lowering, Pellicular Rear Somersault for Landing

The grandfather T-test value was 2.09 under the significance level of 0.05 and a degree of freedom of 6.

Table (3)

Shows the results of the pre- and post-tests of the control group

Significance Level	T calculated	Average spreads	Post-testing		Pre-test		Unit of Measurement	Motor sentence
			on	Going to	on	Going to		
D	2.88	0.682	0.687	7.569	0.653	6.887	Degree	Weighted, Inverted Suspension, Depression Suspension, Angular Pivot Depression, Angled Pivot Body Lowering,

								Pellicular Rear Somersaul t for Landing

The grandfather T-test value was 2.09 under the significance level of 0.05 and a degree of freedom of 6

Table (4)

Shows the results of the post-test of the two research groups

Significanc e Level	T calculate d	Averag e spreads	Control Group		Experimental Group		Unit of Measuremen t	Motor sentence
			on	Goin g to	on	Goin g to		
D	**3.56**	**1.656**	**0.68 7**	**7.569**	**0.54 3**	**9.225**	**Degree**	**Weighted, Inverted Suspension , Depression Suspension , Angular Pivot Depression , Angled Pivot Body Lowering, Pellicular Rear Somersault for Landing**

* Grandfather T = 2.09 under the significance level of 0.05 and with a degree of freedom of 12

Discussing the results of the post-tests of the two research groups:

Through the presentation and analysis of the results of the two groups, the research showed that there are significant differences in favor of the experimental group in the skill level of motor sentences on the throat system, and the researchers attribute the reason to the proposed educational design according to the STEAM approach in learning some basic skills in artistic gymnastics has greatly affected and this is confirmed by (Hassan: 2009) and (Ahmed and Khattab: 2009) that reaching the required level for the performance of motor sentences depends to a greater extent on physical qualities and organized exercises, which are one of the most important The main components and elements in learning and acquiring motor skills and the success of their performance well. The results showed an

improvement in the degree of motor sentences on the throat system, as these results were consistent with the results of a study (Al-Issa: 2013), the results of which showed that the proposed educational design led to the improvement of the selected motor sentence on the throat system among the members of the experimental group. The researchers were also careful not to gather too much information to avoid making mistakes, and this is consistent with a study (Shehata: 2010). Also, the use of appropriate and balanced repetitions in terms of the level of difficulty of the motor sentence had the effect of reaching a state of satisfaction with the correct performance, even if it is at a low level, and then gradually develops as the difficulty increases and the success in the performance increases, and takes into account their individual differences.

3. Conclusions and Recommendations:

3.1 Conclusions:

Through the results, the researchers reached several conclusions, which are:

- The proposed STEAM instructional design in learning some basic skills in artistic gymnastics has a statistically significant positive effect to improve the degree of motor sentences on the throat system.
- There are significant differences between the two research groups and in favor of the experimental group.

3.2 Recommendations:

- Circulating the results of the current research to benefit from it in the preparation of educational programs.

- The necessity of conducting research on the design of the educational program in learning other sports activities.

- The necessity of conducting research on the design of the educational program for other age stages.

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