

The Effectiveness Of Using The Programmed Learning Strategy In The Light Of The Sustainable Development Of The Educational Process

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Abstract

This study aimed at identifying the effectiveness of the use of the programmed learning strategy in the light of the sustainable educational process. The researcher applied the experimental method; the study population consisted of (60) male students of the Faculty of Physical Education and Sports Science, at the Hashemite University; and the sample comprised (48) male students enlisted in the physical education teaching methods course. The sample was randomly divided into two equal groups: control group students who were taught using the traditional learning strategy, and the experimental group students who were taught using the programmed learning strategy. The instrument consisted of the programmed learning program, and SPSS was applied. The reliability coefficient of the educational program amounted (0.86).

The results indicated statistically significant differences between the results of the post-test of the experimental and control groups in the performance of the front rolling, rear rolling, human acceleration and standing on the head skills, in favor of the experimental group. The researcher set out a number of recommendations, most important of which underscored the need to encourage teaching the floor movements in gymnastics by programmed learning for both sexes and different ages. This is due to the speed of learning, saving time and effort, taking into account individual differences, and providing the factor of excitement and suspense for the learner.

Keywords: Educational program, programmed learning, floor movement in gymnastics.

Introduction

The world witnessed a rapid technological progress and great development in all the life walks. Such development led to reconsidering the educational system in physical education, as the use of the modern techniques in education led to opening new horizons in the different educational and sports practical aspects (Al-Mabrook, 2006). Education is no longer restricted to the traditional method; rather it developed rapidly and took advanced steps for using the available means in education, to prepare an advanced generation in all the scientific, economic and social areas in the light of the knowledge and globalization age (Maneesi, 2022).

Sport proved to be a cost-effective and flexible tool to enhance the peace and development objectives. Since the very beginnings of the developmental objectives of the millennium in 2000, sports performed a vital role in the multiple resolutions issued by the General Assembly. For instance, in the resolution 1/70 titled "Transforming Our World: The 2030 Agenda for Sustainable Development", which was adopted in 2015, the acknowledgment of the sport role in enhancing the social development continued. Sport also is an important enabler of the sustainable development. And we recognize the growing contribution of sport to achieve development and peace, in view of its role in promoting tolerance and respect; and its contribution to the empowerment of women, youth, individuals and societies; and to achieve the desired goals in the areas of health, education and social integration.

Physical education works to achieve its goals through kinetic, cognitive and emotional goals, using methods and ways of education, which need a successful teacher in his profession, familiar with how to build educational situations in ways that suit the needs and characteristics of learners. In addition, the teaching process plays an important role in the educational system. In this concern, several and innovative teaching methods appeared due to the difficulty in using a one single method in the educational process, as there are many influential variables, such as: modern teaching technology, type of the practiced activity, available abilities, and nature of the educational situation (Abdul Aziz, 2016).

Methods followed by the teachers are among the most important aspects of the educational process, as each method

has a specific role in preparing learners in terms of physical, cognitive, emotional and skill aspects. Therefore, teachers relied on multiple learning methods to provide suitable and diverse educational situations, and not to rely on a single teaching method in education, in order to teach all the learners at the same level (Enad, 2020; Shehata, 2002).

The programmed teaching is nowadays, in the shade of the sustainable development of the educational process, one of the most recent contemporary teaching methods, which rely on the educational experience in which the programmed units take the place of teaching. As a result, they lead the individual through a certain pool of planned, organized and followed-up behavior styles, so that the individual will possess a desired method. This means that the student will learn what he intended to learn through the programmed units (Smith, 2004). It is a teaching method by which the individual, solely, interacts with the educational program, or the educational material, whether audio or visual, or both. Then he will move by himself and at his own pace in learning from one stage to another, after he verifies mastering the previous stage before beginning in the next stage, and so on, until he fully masters the program as a whole (Al-Sa'ie and Al-Ne'aimi, 2001).

The floor movements in gymnastics are one of the artistic gymnastics tools, in which the player performs kinetic sentences that contain many somersaults and windings governed by the international law of gymnastics on a 12x12m floor area (Aziz, 2015). Through the researcher's work in university education, he noticed some difficulties faced by learners in learning some different skills, especially in the recent times, due to the spread of some epidemics and diseases, which negatively affected educational systems all over the world, and also led into closing the schools and universities. Therefore, it is inevitable to look for new educational methods and styles, generate educational programs, and follow-up updated ways in order to overcome these difficulties using an educational program based on the programmed learning. The significance of this study is in using advanced teaching programs to assist the students in the educational process, and in acquiring interactive learning skills. This study is in line with the study of Hussein and Al-Hayani (2019) in that the use of a programmed learning strategy lessens the difficulties that face learning the floor skills in gymnastics.

Study Objective

Identifying the effectiveness of using the programmed learning strategy in the light of the sustainable development of the educational process.

Study Questions

- 1- Are there statistically significant differences at ($\alpha \leq 0.05$) level among the participants of both the control and experimental groups in the pre-measurement?
- 2- Are there statistically significant differences at ($\alpha \leq 0.05$) level in the effectiveness of the use of the traditional learning strategy, in the shade of the sustainable development of the educational process, between the pre-post measurements of the control group participants?
- 3- Are there statistically significant differences at ($\alpha \leq 0.05$) level in the effectiveness of the use of the programmed learning strategy, in the shade of the sustainable development of the educational process, between the pre-post measurements of the experimental group participants?
- 4- Are there statistically significant differences at ($\alpha \leq 0.05$) level between the participants of both the control and experimental groups in the post hoc measurement?

Study Limitations

- **Spatial limits:** Faculty of Physical Education and Sports Sciences, the Hashemite University.
- **Time limits:** First Semester of the University academic year 2021/2022.
- **Human limits:** Students of the physical education teaching methods course, Faculty of Physical Education and Sports Sciences, the Hashemite University.

Methodology and Procedures

Methodology

The researcher applied the experimental method due to its suitability to the nature of this study. The study population consisted of (48) male students who are enrolled in the course of physical education teaching methods in the first semester of the academic year 2021/2022. They were distributed over two equal groups: control group using the traditional learning strategy, and experimental group who were taught using the programmed learning strategy, as shown in Table (1).

Table (1). Characterization of the study sample in the anthropometric variables of the control and experimental groups

| Variables | Experimental Group | | Control Group | | T | P |
|-----------|--------------------|------|---------------|------|-------|------|
| | SD | M | SD | M | | |
| Height | 172.9 | 5.17 | 172.43 | 4.86 | 0.186 | 5.27 |
| Age | 19.40 | 0.60 | 19.51 | 0.55 | 0.24 | 4.36 |
| Weight | 69.7 | 4.36 | 70.30 | 5.01 | 0.36 | 1.09 |

Table (1) did not show statistically significant differences at ($\alpha \leq 0.05$) level between the control and experimental groups in the anthropometric variables, which indicate the equivalence of the two groups.

Study Instrument

The researcher constructed a teaching program using the programmed learning strategy in teaching certain floor movements in gymnastics. The program was presented to (8) specialists in the physical education, computer and software teaching, and gymnastic teaching areas, to ensure possibility of applying it on the students. Many scientific research and references, such as Hasan (2007), which used some of these tests, indicate that they are characterized by high reliability coefficients. They were further applied to an exploratory sample consisted of (5) male students from outside the study sample, to ensure the validity and reliability. In this regard, the researcher applied the retest as shown in Table (2).

Table (2). Reliability coefficients of all the skills

| No. | Test | Reliability Coefficient |
|-----|----------------------|-------------------------|
| 1 | Front Rolling | 0.75 |
| 2 | Rear Rolling | 0.91 |
| 3 | Human Acceleration | 0.71 |
| 4 | Standing on the Head | 0.71 |

The Educational Program

The educational program included teaching units that included explaining the technical points of every skill, in addition to illustrations and explanation of the common mistakes that may take place, as well as learning videos pertinent to the program. The program further included the basic skills of the floor movements in gymnastics, namely: (front, balled rolling movement skill, rear, balled rolling movement skill, human acceleration skill, and standing on the hand movement skill).

Certain video clips were chosen for some players who have experience in practicing the gymnastic skills. These skills were divided into teaching slides and illustrative parts that explain the teaching steps of every skill. Gradations from the easy to the difficult and from the simple to the complex were taken into account. Each skill has been divided into a number of parts through slides, some of which are fixed: (parts and clips of images), others are mobile, the movement of which is controlled by the user of the software. The skill was entirely performed in the beginning and end of the show, and the software was prepared in a manner that allows the student to enter to it easily, so that the student can follow the teaching instructions that illustrate how to use it.

Program Application

The program was applied as of the first semester of the academic year 2021/2022 over (8) weeks. The pre-measurements of both the control and experimental groups were taken in the beginning of the academic semester. Thereafter, the program was applied over (8) weeks at the rate of two educational units weekly. The program was sent through Microsoft Team Program and included video link that contained movement clips of the entire skill and fixed images, in addition to the educational explanation of the teaching steps and common errors that may exist in the performance, so that the students can view them. The post hoc measurements were taken directly after the application of the program.

Statistical Processing

Data analysis was made using the (SPSS) Program, and the means (M's), standard deviations (SD's) and T-Test were calculated to identify the differences between the means.

Results and Discussion

Q1: "Are there statistically significant differences at ($\alpha \leq 0.05$) level among the participants of both the control and experimental groups in the pre-measurement?" To answer this question, the means, standard deviations, and T value were calculated for each gymnastics skill, as shown in Table (3).

Table (3). Means, standard deviations, and T value of the pre-measurement between the control and experimental groups

| Skills | Group | M | SD | T | P |
|---------------|--------------|------|------|-------|-------|
| Front Rolling | Control | 1.40 | 0.77 | 0.108 | 0.854 |
| | Experimental | 1.36 | 0.99 | | |

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|----------------------|--------------|------|------|-------|-------|
| Rear Rolling | Control | 1.40 | 0.86 | 2.205 | 0.052 |
| | Experimental | 0.93 | 0.77 | | |
| Human Acceleration | Control | 0.73 | 0.78 | 0.100 | 0.921 |
| | Experimental | 0.71 | 0.66 | | |
| Standing on the Head | Control | 1.37 | 0.76 | 0.726 | 0.471 |
| | Experimental | 1.21 | 0.83 | | |

Table (3) shows that there are no statistically significant differences at ($\alpha \leq 0.05$) level between the control and experimental groups in the pre-measurement for all the skills, which include: front rolling, rear rolling, human acceleration, and standing on the head. This result indicates the equivalence of the two groups in the performance of all the skills.

Q2: "Are there statistically significant differences at ($\alpha \leq 0.05$) level in the effectiveness of the use of the traditional learning strategy, in the shade of the sustainable development of the educational process, between the pre-post measurements of the control group participants?" To answer this question, the means, standard deviations, and T value were calculated for each gymnastics skill, as shown in Table (4).

Table (4). Means, standard deviations, and T value between the pre-post measurements of the control group

| Skills | Measurement | M | SD | T | P |
|----------------------|------------------|------|------|--------|-------|
| Front Rolling | Pre-measurement | 1.40 | 0.77 | -23.78 | 0.000 |
| | Post-measurement | 6.43 | 1.10 | | |
| Rear Rolling | Pre-measurement | 1.40 | 0.86 | -18.62 | 0.000 |
| | Post-measurement | 6.27 | 1.11 | | |
| Human Acceleration | Pre-measurement | 0.73 | 0.78 | -15.58 | 0.000 |
| | Post-measurement | 5.20 | 1.40 | | |
| Standing on the Head | Pre-measurement | 1.37 | 0.76 | -15.44 | 0.000 |
| | Post-measurement | 5.97 | 1.47 | | |

Table (4) shows statistically significant differences at ($\alpha \leq 0.05$) level between the pre-measurement and post-measurement of the control group participants, who used the traditional learning strategy, in all the skills, in favor of the post-measurement. The researcher ascribes this result to that the traditional learning program is basically applied to the university students along with the role of the effective teacher, in providing the skills and applying them properly, in spite of the challenges that face both the teacher and student due to the use of this method.

Q3: "Are there statistically significant differences at ($\alpha \leq 0.05$) level in the effectiveness of the use of the traditional learning strategy, in the shade of the sustainable development of the educational process, between the pre-post measurements of the experimental group participants?" To answer this question, the means, standard deviations, and T value were calculated for each gymnastics skill, as shown in Table (5).

Table (5). Means, standard deviations, and T value between the pre-post measurements of the experimental group

| Skills | Measurement | M | SD | T | P |
|----------------------|------------------|------|------|--------|-------|
| Front Rolling | Pre-measurement | 1.36 | 0.99 | -42.77 | 0.000 |
| | Post-measurement | 8.21 | 0.69 | | |
| Rear Rolling | Pre-measurement | 0.93 | 0.77 | -31.22 | 0.000 |
| | Post-measurement | 7.93 | 0.81 | | |
| Human Acceleration | Pre-measurement | 0.71 | 0.66 | -23.81 | 0.000 |
| | Post-measurement | 6.71 | 1.21 | | |
| Standing on the Head | Pre-measurement | 1.21 | 0.83 | -25.29 | 0.000 |
| | Post-measurement | 7.64 | 1.06 | | |

Table (5) shows statistically significant differences at ($\alpha \leq 0.05$) level between the pre-measurement and post-measurement of the experimental group participants, who used the programmed learning strategy in all the skills, in favor of the post-measurement. The researcher ascribes this result to the effectiveness of the designed learning program. In this concern, the researcher emphasizes the comprehensiveness of this program on the physical and skill aspects, which contributes to improving the performance of the skills of front and rear rolling, human acceleration, and standing on the head. It is also due to that this strategy increases the interactivity, raises the accomplishment motivation and its ability to remove the obstacles, get rid of fear, and create a spirit of challenge while increasing the element of suspense and providing individual feedback provided by the program. This result is in agreement with those of Prothero (2020) and Ibrahim (2012) in that the educational program using the programmed learning strategy provides an opportunity to view the optimal performance and the ideal model of the movements to be learned, which reduces errors and provides the opportunity to watch the parts of the skill more than once, and focus on the difficult parts of the skill.

Q4: "Are there statistically significant differences at ($\alpha \leq 0.05$) level between the participants of both the control and experimental groups in the post hoc measurement?" To answer this question, the means, standard deviations, and T value were calculated for each gymnastics skill, as shown in Table (6).

Table (6). Means, standard deviations, and T value of the post-measurements between the control and experimental groups

| Skills | Group | M | SD | T | P |
|----------------------|--------------|------|------|-------|-------|
| Front Rolling | Control | 6.43 | 1.10 | -7.43 | 0.854 |
| | Experimental | 8.21 | 0.69 | | |
| Rear Rolling | Control | 6.27 | 1.11 | -6.46 | 0.052 |
| | Experimental | 7.93 | 0.81 | | |
| Human Acceleration | Control | 5.20 | 1.40 | -4.39 | 0.921 |
| | Experimental | 6.71 | 1.21 | | |
| Standing on the Head | Control | 5.97 | 1.47 | -4.94 | 0.471 |
| | Experimental | 7.64 | 1.06 | | |

Table (6) shows that there are no statistically significant differences at ($\alpha \leq 0.05$) level between the control and experimental groups in the post-measurement for all the skills, with preference to the experimental group. The researcher attributes this result to the positive effect of the educational program, which was designed using the programmed learning strategy. Furthermore, there was an effect of the method of presenting the program, and the accompanying factors of excitement and suspense, involving students in the educational process, saving time and effort, taking into account individual differences between students, and providing feedback to them. It also provided an opportunity to view the optimal performance of the movements, which increased their motivation toward learning the skills and creating the spirit of challenge and competition among the students.

Finally, the researcher believes that while the traditional learning strategy is still working in making a statistically significant difference in teaching some floor movements in gymnastics (front rolling, rear rolling, human acceleration and standing on the head), teaching these movements using the programmed learning strategy seems more effective. This is because the difference in the post-measurement between the control and experimental groups was in favor of the experimental group who used the educational program

through the programmed learning strategy. This result is in agreement with Hassoun (2018), Al-Qawaqzeh (2018) and Antoniou, et al (2003), which showed that the programmed learning has a positive effect in students' learning of the floor skills of gymnastics. In addition, teaching the stand on arms skill using the programmed learning strategy is more effective than the traditional learning strategy. The results of our study were also in line with Al-Soub (2002) and Mckethan, et al (2000) in that the programmed learning strategy helps in the development and improvement of the human acceleration skill. Furthermore, this study is in line with Al-Dsouqi, et al (2021), Khataybeh, et al (2021), and Vrndakis, et al (2018) in that teaching using the computerized programs and multiple educational aids in learning certain skills and different sports events is better as compared with the traditional strategy.

Conclusions

- 1- The programmed learning has a positive effect in students' learning of the floor skills of gymnastics.
- 2- Teaching the gymnastics skills using the programmed learning strategy is more effective than the traditional learning strategy.
- 3- Programmed learning strategy helps in the development and improvement of learning the floor skills of the gymnastics.

Recommendations

- 1- Using the programmed learning strategy in learning the floor movements of the gymnastics for both genders and different ages.
- 2- Conducting similar studies using the programmed learning strategy on other sports, such as basketball, handball, fencing, swimming, and others.

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