

Received: December 2023 Accepted: January 2024

DOI: <https://doi.org/10.58262/ks.v12i2.259>

## The Effect of Using Learning Methods according to the Exercise Schedule (Distributed and Intensive) on Learning and Retaining Some Basic Skills on the Floor Movements in Gymnastics

Maysaloun Kamel Alshadideh<sup>1\*</sup>, Salamah Ahmed Al-Majali<sup>2</sup>, Abdel rhman Ahmad Alkbraireet<sup>3</sup>, Karam Khalaf Naser Abo A'Aqoulah<sup>4</sup>

### Abstract

*The study aimed to identify the effect of using learning methods according to the exercise schedule (distributed and intensive) in learning and retaining some basic skills on the floor movements in gymnastics. The students were drawn were distributed into two equal groups (the distributed method group and the intensive method group) with (7) female students for each group. Study found that both methods have a positive impact on learning some basic skills on the floor movements mat, with a clear, statistically significant advantage for the distributed learning method in learning and retaining some basic skills on the floor movements mat.*

**Keywords:** Exercise Scheduling, Distributed Learning Method, Intensive Learning Method, Retention.

### Introduction

Gymnastics constitutes an important aspect of general sporting activity, as gymnastics includes many skills that the player must master and train on, due to the possibility of installing the motor system on equipment according to the required standards (Abuwarda, Mansy & Megahed, 2024). Gymnastics is one of the basic sports that contribute to preparing players and developing their performance through exercises and ground movements because it helps in the development and development of the individual from the physical and intellectual aspects because it relies on scientific principles that help to reach the highest levels (Alshadideh, 2018). When learning these skills, the player needs a large number of repetitions, in addition to having appropriate motor abilities for these skills (Mohsen, Shehab & Sakran, 2024).

The basic skills of floor movements in gymnastics are the backbone and basic foundation upon which the rest of the skills in other apparatuses are based. By mastering the basic skills of the floor movements mat, there is a transfer of learning to the rest of the apparatus skills, due to the similarity of the basic skills between the different gymnastics apparatuses. (Zidane, Hamza, & Ahmad, 2024) and this agrees. With what (Al-Bakri & Yasir, 2024) mentioned, mastering basic ground movement skills gives the player great compatibility that helps him perform difficult movements, as well as movements on the rest of the equipment, as they are all closely

<sup>1</sup> Assistant Professor, Department of Physical Education, Al al-Bayt University, Jordan, Email: [maysloon2777@aabu.edu.jo](mailto:maysloon2777@aabu.edu.jo)

\*Corresponding Author: Orcid: <https://orcid.org/0000-0002-3216-745X>

<sup>2</sup> Ministry of Education, Educational supervisor, Jordan, Email: [salameh87majali@gmail.com](mailto:salameh87majali@gmail.com)

<sup>3</sup> Ministry of Education, Head of the school sports department, Jordan, Email: [shteweabed@yahoo.com](mailto:shteweabed@yahoo.com)

<sup>4</sup> Assistant Professor, Department of Physical Education, Al al-Bayt University, Jordan, Email: [kaboaqouleh@aabu.edu.jo](mailto:kaboaqouleh@aabu.edu.jo)

linked to each other.

Motor learning as a series of variables that occur during acquired experience to modify human behavior, which is the process of acquiring, developing and consolidating motor skills as well as the ability to use and retain them (Al-Ali & Abdulzahra, 2024). Learning and practicing motor skills for different sports depends mainly on the use of memory and mental processes, which are represented in the steps of receiving information from the senses and then processing it, remembering it, and then removing it motorically in accordance with the individual's ability (Gibson, Wagner & Heyward, 2024). Memory and learning each require the presence of the other. Without accumulating experience, processing it, and retaining it, there is no learning, and if learning refers to modifications occurring in behavior as a result of the influence of previous experience, then memory is the process of consolidating these modifications, preserving them, and keeping them ready for use (Engle, 2010). The factors that influence... In achievement and acquisition, they are the same as those that affect remembering, retention, and retrieval. The conditions that facilitate learning are the same as those that facilitate retention, and the levels of recollection and retrieval are the same as the levels of learning (Gibson, Wagner & Heyward, 2024). Memory is a main condition for learning, and that learning is rooted in the concept of memory. Learning does not occur if the individual does not have the ability to have a memory for that thing (Cabrejas, et al, 2023).

Retention as the ability to remember and retrieve information. It reflects learning and is the most reliable means of measuring motor learning after giving the learner a period of days after which he returns to measure his performance. The closer the performance measurement is to the other measurement, the closer the retention is and the more effective learning (Zaggelidou, et al, 2023). Motor skills are learned through attention and repetition many times and for a long time, and the longer the training and learning time increases, the greater the ability to retain those motor skills. Therefore, emphasis must be placed on the process of repetition and repetition for the learner and diversification in the use of educational techniques and strategies that help retain and test Retention provides us with the results of how much memory is retained or lost (Ata, 2021).

There are large differences in motor skills, many different educational methods and methods have been found, and therefore the choice of the method or educational method must be proportional to the skill to be learned and the capabilities of the learners (Schmidt & Lee, 2014). To indicate that there must be diversification in The method of implementing the exercise when teaching motor skills in order to suit the individual differences of the learners, which leads to retaining the skill and retrieving it in the required manner (Finteel, et al, 2022). Scheduling the exercise is one of the methods that contributes positively to achieving diversity in the exercises used and the methods of implementing them, as well as facilitating the practice process. New educational methods have emerged that are applied within training for the purpose of developing and improving performance (Kareem, et al, 2022).

Learning exercises can be organized and scheduled according to the type of skill and its requirements, as well as the level and capabilities of the learners and their degree of experience (Simonek, 2012). In order to achieve learning and make the exercise effective, proper, gradual, directed planning and consistent organization of the various exercises must be followed, and mistakes must be avoided (Apidogo, et al, 2023). Process of organizing and scheduling exercise is an important matter in the educational process because it contributes to achieving diversity in the exercises used and the methods of implementing them, as well as facilitating the process of learning the skill, taking into account the difficulty or ease of the skill to be learned. Through

gradation and following organization in exercise methods when performing skills. Also, the process of scheduling and organizing exercises and how to build them is an essential essence in the learning process (Zaggelidou, et al, 2023). There are different types and forms of scheduling exercise to achieve goals during the educational unit, and among these methods are The distributed method gives a longer rest rate in the case of sequential exercise. The rest may be as long as the time of performing the exercise or more, depending on the skill that is given during the educational unit. As for the intensive method, it is the one in which the learner practices the skill continuously and without rest periods between repetitions, or with few rest periods between them. Total repetitions while performing the exercise (Abdel Amir, et al, 2015).

Therefore, this study attempted to identify The Effect of Using Learning Methods According to the Exercise Schedule (Distributed and Intensive) on Learning and Retaining Some Basic Skills on the Floor Movements in Gymnastics, by preparing study tools and referring to previous studies, as explained in part methodology and then draw conclusions and provide appropriate recommendations.

## **Method**

The researchers used the experimental approach due to its suitability to the nature of the study requirements by designing two experimental groups and applying pre and post-measurement to each group. The study sample consisted of (14) female students from the gymnastics course (1) in the Department of Physical Education-Al-Bayt University. They were chosen Non-Probability Sample from Population after obtaining their consent to represent the study sample. The weights of the study sample members ranged between (52-71kg), where the mean of the weight variable reached ( $61.64 \pm 4.29$ ), the value of Skewed (0.02), and the value of Kurtosis (1.05) kg. These are acceptable values that indicate the homogeneity of the sample members. The lengths of the study sample members ranged between (152-172) cm. The mean for the length variable was ( $164.29 \pm 4.55$ ), the value of Skewed was (0.04), and the value of Kurtosis was (-0.22). These are acceptable values that indicate the homogeneity of the sample members in the variables (height and weight).

For equality between the study groups (distributed learning, intensive learning), the Independent Samples T-Test was applied to the variables of the study sample members (height, weight) according to the group variable, and it was found that the means, standard deviations, and (I) calculated between the two groups in weight and height variables. By reviewing the calculated (I) values, we find that it was less than the tabulated value at the level of ( $\alpha \leq 0.05$ ), which indicates that there are no statistically significant differences between the two groups, which indicates their equality in weight and height variables.

The researchers also applied the Independent Samples T-Test to the performance of the study sample members in the skill performance tests for floor movements in gymnastics (front balance, front roll, handstand) in the pre-measurement according to the group variable, and it was found that the means and standard deviations, calculated (I) value between the two groups in the variables of gymnastics skills (front balance, forward roll, and handstand). By reviewing the calculated (I) values, we find that it was less than the tabulated value at the level of ( $\alpha \leq 0.05$ ), which indicates that there are no significant differences. Statistical significance between the two groups, which indicates their equality in gymnastics skill variables (front balance, front roll, handstand).

The researchers conducted a semi-experiment study on a sample of (4) female students outside

the original study sample. The aim of the experiment was to identify the suitability of the procedures taken to implement the study, as well as to ensure the safety of the tools used in the research and the suitability of the tests used to evaluate the level of skill performance of gymnastics, in addition to know the obstacles and problems that they may face while conducting the study, and to know the suitability of the educational units, and the appropriate time to implement them, as well as the tests, in addition to conducting the reliability coefficient for the skill tests with a time interval of 7 days between applying the test and re-applying it, the highest of which was for the skill (handstand) and amounted to (0.89). The lowest level was for the skill (front balance) (0.83). These values are considered stable and indicate the stability of the skill tests used in the study.

The steps for designing the educational units for the two educational programs were developed according to the methods of distributed training and intensive training, after referring to theoretical literature and previous studies, such as the study of (Abdul Karim & Al-Banna ,2021; Al-Majali, 2019; Al-Jubouri; 2013), and presenting them to a number of Experts and specialists in the field of sports and the field of teaching methods, motor learning and gymnastics (7) arbitrators to express an opinion on the suitability of the educational program and tests with the aim of the study and the study sample and to make any amendment they deem appropriate to the program in terms of the number of educational units for each skill, the time of the educational unit, the number of repetitions and rest periods. between the repetitions and the content of each educational unit, in addition to the suitability of the tests used and their number with the research sample. Some minor modifications were made to the program, and they indicated the validity of the content of the program and the tests, meaning that the tests measure what they were designed for, so two educational programs were built, prepared by the researchers, for a period (8) weeks, and each of the two programs may consist of (16) educational units, with two educational units per week. Each educational unit has specific goals and a specific time that accurately reflects the setting of goals. The two programs include learning methods (distributed and intensive) in teaching floor movements in Gymnastics. Taking into account that the educational units are appropriate to the level of the sample and at a rate of (45) minutes per unit, the units were divided into three parts: the introductory part, which was given a time of (10) minutes, the main part, which was given a time of (30) minutes, and the concluding part (5). minutes.

Both methods (distributed and intensive) agreed in the introductory part and the closing part and differed in the main part and were as follows: Distributed learning method The researchers scheduled the exercise within the educational unit by giving sufficient rest periods between repetitions of the exercise, and the percentage of rest periods may be equal to the time of performing the exercise or more. For example, if the duration of practice is (30 seconds), the player is given a rest time of (30 seconds), or it may be a little more than that. In the intensive learning method, the researchers scheduled the exercise within the educational unit by giving relatively few rest periods between the exercise attempts. For example, if the duration of the exercise requires (30 seconds), the student is given a rest time of (5 seconds), and perhaps without rest time between repetitions.

After reviewing many sources, practical references and previous relevant studies in the field of motor learning and gymnastics in general and floor movements in particular, the researchers found many models of tests that measure the skill performance of floor movements in gymnastics, which reflect the level of learning, and models were chosen from them. And consulting specialists, while making some modifications to it in a way

that is compatible with the research sample and the abilities of the female students. (Forward balance skill test, front rolling skill test, and handstand skill test). Grades were calculated to measure the level of skill performance by calculating grades according to the teacher's registration form approved and prepared by the Jordanian Gymnastics Federation.

The researchers also used the following tools to achieve the objectives of the study (tests to evaluate gymnastics skills, a registration and evaluation form for tests approved by the Jordanian Gymnastics Federation, the gymnastics hall / Department of Physical Education / Al Al-Bayt University, gymnastics mats (8), Swedish chairs (4), watch timer (3), a whistle, a medical scale to measure weight in kilograms, and a device (restameter) to measure height.

After the end of the educational program, through the use of the distributed and intensive training scheduling methods, the researchers conducted the post-tests for members of the two groups (Distributed method, Intensive method). After completing the measurement of the post-tests, and after giving the study sample and the two groups a rest period of (14) days, and after the end of the rest period, the researchers conducted Retention test for both groups in the same way as was followed in the pre- and post-tests.

## Result

Results related to the first hypothesis: There are statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) for using the two learning methods according to the exercise schedule (distributed and intensive) in learning some basic skills on the floor movements in gymnastics between the pre- and post-measurements and in favor of the post-measurement.

To verify the hypothesis, the Paired Samples T-Test was applied to the performance of members of the sample of the two groups (distributed and intensive) to learn some basic skills on the floor movements in gymnastics in the two measurements (pre-post), and Tables No. (1) and (2) They explain that.

**Table 1:** Applying the Paired Samples T-Test to the Performance of Members of a Sample Group (Distributed Learning Method) to Learn Some Basic Skills in Gymnastics in the Two Measurements (Pre and Post).

<b>Distributed Method Learning</b>					
Skills	Pre-Test	Post-Test	Percent	T	Sig
Front Balance	2.32 ± 0.77	4.35 ± 1.76	43.5%	9.88	0.005
Front Roll	2.44 ± 0.88	4.55 ± 1.75	45.7%	8.31	0.007
Handstand	2.05 ± 0.36	4.60 ± 0.95	48.5%	10.30	0.000

Table 1. Show that the (T) values for the performance of the members of the (distributed method) group for learning some basic skills on the floor movements in gymnastics in the two measurements (pre and post- test) are statistically significant at the significance level ( $0.05 \geq \alpha$ ), in favor of the measurement. dimensional; When comparing the pre- and post-test means, it was found that there was an improvement in the performance of the members of the (distributed method) group, which indicates the presence of a statistically significant effect at the significance level ( $0.05 \geq \alpha$ ), for using the distributed learning method in learning some basic skills on the floor movements in gymnastics.

**Table 2:** Applying the Paired Samples T-Test to the Performance of Members of a Sample Group (Intensive Learning Method) to Learn Some Basic Skills in Gymnastics in the Two Measurements (Pre and Post).

<b>Intensive Method Learning</b>					
Skills	Pre-Test	Post-Test	Percent	T	Sig
Front Balance	2.22 ± 0.85	3.33 ± 1.73	22.0%	11.05	0.000
Front Roll	2.44 ± 0.88	3.45 ± 1.33	24.3%	10.31	0.005
Handstand	2.10 ± 0.66	3.50 ± 0.88	30.8%	9.30	0.006

Table 2. Show that the (T) values for the performance of the members of the (Intensive Method) group for learning some basic skills on the floor movements in gymnastics in the two measurements (pre and post- test) are statistically significant at the significance level ( $0.05 \geq \alpha$ ), in favor of the posttest; When comparing the pre- and post-test means, it was found that there was an improvement in the performance of the members of the (Intensive Method) group, which indicates the presence of a statistically significant effect at the significance level ( $0.05 \geq \alpha$ ), for using the Intensive Method in learning some basic skills on the floor movements in gymnastics.

Results related to the second hypothesis: There are statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) for using the two learning methods according to (Distributed and Intensive) in the post-test of learning some basic skills on the floor movements in gymnastics, in favor of the distributed learning method group.

To verify this hypothesis, the Independent Samples T-Test was applied to the study sample members in the post-test according to the group, and Table 3 shows this.

**Table 3:** Applying the Independent Samples T-Test to the Performance of Members of a Sample Group (Intensive Learning Method) to Learn Some Basic Skills in Gymnastics in Post Test.

Skills	Intensive Method Learning	Distributed Method Learning	T	D.f	Sig
Front Balance	3.33 ± 1.73	4.22 ± 0.85	11.05	22	0.03
Front Roll	3.45 ± 1.33	4.44 ± 0.88	10.31	22	0.01
Handstand	3.50 ± 0.88	4.10 ± 0.66	9.30	22	0.01

Table 3. shows that there are statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) in the post-measurement between the two groups (distributed learning method and intensive learning method) for all gymnastics skills under study (front balance, front roll, handstand). The differences were in favor of the distributed learning method group, as all measurements were better than those in the intensive learning method group.

Results related to the third hypothesis: There are statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) for using the two learning methods according to the exercise scheduling (distributed and intensive) in retaining some basic skills on the floor movements in gymnastics, in favor of the distributed learning method group.

To verify the hypothesis, the Independent Samples T-Test was applied to the performance of members of the sample of the two groups (distributed and intensive) to retain some basic skills in gymnastics in the two measurements (post and retention), Table 4 show this.

**Table 4:** Applying the Independent Samples T-Test to the Performance of Members of the Sample of the Two Groups (Distributed and Intensive) to Retain Some Skills in Gymnastics in the Two Measurements (Post and Retention).

Skills	Intensive Method Learning		Distributed Method Learning		T	D.f	Sig
	Post-Test	Retention	Post-Test	Retention			
Front Balance	3.33 ± 0.45	3.00 ± 0.22	4.22 ± 0.66	4.01 ± 0.56	3.25	22	0.05
Front Roll	3.45 ± 0.78	3.02 ± 0.56	4.44 ± 0.77	4.10 ± 0.65	2.19	22	0.01
Handstand	3.50 ± 0.44	3.09 ± 0.37	4.10 ± 0.54	3.95 ± 0.33	2.33	22	0.00

Table 4. show that there are statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) in retention between the two groups (distributed learning method and intensive learning method) for all gymnastics skills under study (front balance, front roll, handstand). The differences were in favor of the distributed learning method group, as all measurements were better than those in the intensive learning method group.

## Discussion

Results show that there are statistically significant differences between the pre- and post-test for the distributed learning method group, and in favor of the post-test, as the means in the post-test were better for all tests of gymnastics skills (front balance, front roll, handstand), which indicates the effect of using distributed learning in learning some basic skills in gymnastics.

The results also showed that there were statistically significant differences between the pre- and post-test for the intensive learning method group, and in favor of the post-test, as the mean in the post-test were better for all gymnastics skills tests (front balance, front roll, handstand), which indicates the effect of using learning. Intensive in learning some basic skills in gymnastics.

Researchers attribute the reason for this to the effectiveness of scheduling distributed and intensive training in the applied part of the educational unit, as the two methods, distributed and intensive, and their philosophy is based on the principle of repeating skill performance, and repetition is an effective process in acquiring and developing learning. (Gibson, Wagner & Heyward, 2024) indicates that the individual's correct repetition of the motor paths helps the individual learn, and the repetition and auxiliary exercises led to this progress in learning these skills. In addition, the two methods used are modern methods that female students must use in their learning of motor skills. Which, in turn, removed the boredom factor, added an element of suspense, instilled in them the spirit of actual participation, and increased their enthusiasm and motivation to learn. (Magill, 2007) confirm the necessity of diversifying by using training scheduling methods to speed up the learning process and add an element of suspense and enthusiasm.

The results also showed that there were statistically significant differences in the post-test between the distributed learning method group and the intensive learning method for all the gymnastics skills under study, (front balance, front roll, and handstand), where the differences in favor of the distributed learning method group, as all post-test is better than that of the intensive learning method group. The researchers attribute the reason for this to the distributed learning method and scheduling of the exercise within the educational unit mainly focuses on the principle of having sufficient rest periods between one repetition and another, which helps

learners focus and pay attention and obtain different types of feedback in addition to this method and gives learners a greater opportunity to recover and return the body to a normal state. Since this method provides sufficient rest periods for the learner to return to his normal state, which makes the learning process go better, as for the intensive method, this method does not provide sufficient rest periods for the commanding learner, which leads to rapid fatigue, and thus learner loses his concentration when performing skill. Or constantly moving. Also, continuous repetition of motor skills generates fatigue for learner in addition to loss of focus and motivation towards learning.

Regarding retention, the results showed that there were statistically significant differences in the retention test between the distributed learning method group and the intensive learning method group for all the gymnastics skills under study (front balance, front roll, and handstand), as all measurements of retention and retention percentage were better in the group. The distributed method is from the group of intensive learning methods. Researchers attribute the reason for this to the fact that the distributed learning method allows the learner to mentally review the motor skill through rest periods between repetitions. Rest periods help learners consolidate motor skills, which leads to easy remembering and retrieval and reduces the value of forgetting. The distributed method reduces negative interference, and the interference theory is one of the theories that explained the cause of forgetting. The long rest period between repetitions gives an opportunity to get rid of or avoid these negative interferences, and this is consistent with what was indicated by (Carballeira, et al, 2023) the reason for losing information stored in short-term memory and forgetting it until it is replaced. With other new information (theory of interference or substitution) or due to neglect and failure to practice information and experiences for a long period of time (theory of decay or damage). The ability of this memory to retain information and increase its processing capacity can be enhanced through the use of some strategies such as (collecting or packaging, recitation). Or practice and repetition). The effectiveness and ability of short-term memory to retain can be increased through correct repetition of motor paths and giving short-term rest periods between applying the motor skill and repeating it (Janssen, 1995). The rest periods Short-term effect on accurately maintaining motor stability on a stationary bicycle device (Batayneh, et al. 2013).

As for the intensive method, repeating the application of the skill without taking rest periods increases the negative effects between repetitions, which leads to an increase in the level of loss of parts of the motor skill. Also, repeating the application of the skill without taking rest periods leads to fatigue, which negatively affects the levels of higher mental processes. (Attention, perception, memory...etc.). Gymnastics skills are complex and complicated skills that require students to take rest periods between repetitions to remember the movement, something that the intensive method does not provide. Performing relatively complex sports movements depends on the learners remembering the movements with their subtleties and details (Abuwarda, Mansy, & Megahed, 2024).

## **Conclusion**

In view of the limitations of this study, the results provide useful information regarding the use of learning methods according to the scheduling of distributed and intensive training, as it is necessary to search for the best and most successful ways and methods to teach and train the basic skills of floor movements to reach the stage of mastery and mechanism in performance and to establish the motor skill correctly, as Gymnastics skills are complex and difficult skills that require specialists to use modern learning strategies, schedule the exercise within the educational unit, and strategies for consolidating motor information and retaining it in memory. Calculating the value of the absolute retention error of the motor skill (the amount of motor



skill lost) is considered a way to determine Learning level. Attention must be paid to using distributed and intensive exercise scheduling within the educational unit when teaching gymnastics skills in general and floor movement skills in particular, while giving sufficient rest periods between repetitions because of their role in increasing the level of learning and retaining motor skills, and paying attention to conducting studies and research on other exercise scheduling methods. Various gymnastics equipment.

### **Conflict of Interest**

There is no conflict of interest exists. Or any financial support received by researchers

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