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The effect of the random and sequential exercise method on learning and accquiring the performance of the tennis forehand

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Abstract
The methods of modern scientific development have included various fields of life and scientific applications have begun to take a wide space to create a developed and renewable world, investing all scientific methods and means in all areas of life, including the field of physical education, to reach the advanced scientific achievement. Hence the importance of the research to put practical steps in front of those interested in the educational process in general and tennis in particular to be a guide for teachers by recognizing the preference of any of the random and sequential exercise methods in learning and acquiring the performance of the forehand and knowing which of the methods are more influential in the learning process, which helps to facilitate In the process of learning and economy in effort, and the research problem lies, the researcher chooses some methods of scheduling the exercise and uses them to teach the skills of the game of tennis.
Keywords*: random exercise, sequential exercise, acquisition, tennis*

Introduction

"Learning any skill through the practice of various exercises must be done through the correct practice of the skill in conditions similar to the competition and focus on the accuracy of performance with the optimal use of practice time and with high efficiency." And the selection of exercises for any method of learning has a great place in various sports and sports activities, including tennis, because it is the basis for reaching the peak of art in the performance and mastery of the skill from the learners. and influential. The selection process is a somewhat complicated task. Only the teacher can determine the method that suits his educational unit and his students. Each method has its own curriculum, and there is no specific method that suits all learners or suits all circumstances. By following the method of random exercise, the performance of the skill from a position of stability ensures its performance with good accuracy and this is related to the balance that occurs when performing that skill. Performing it in unbalanced positions and with different movements" (Mohammed Sahbi, 1988, p. 365), in addition to the fact that the stability of the positions that the learner performs in the opponent's court and training on them will undoubtedly raise the level of accuracy. And the change in the places where the ball is hit, whether by sending or the forehand or the backhand, and the change in the places of directing to the opponent's court are suitable conditions for the random exercise method (which is the best method in the later stages of learning, for what it achieves in creating programs and kinetic laws that the learner can benefit from). And it helps him to perform that skill under the conditions of the game or the match, as the performance must take place from different places, angles and directions (Amer Rashid, 1998, p. 78). The function of random exercise is to develop the performance plan and the development of the motor program, and that the individual acquires a motor plan through exercise, but the random exercise increases the development of this plan, in addition to the fact that the learner performs new types of duty more efficiently than the fixed exercise, and increases flexibility in performing the

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skill. And the sequential exercise can provide a good opportunity for the student to examine and self-review, and over time, it creates an incentive for the student to provide feedback as well as conscious use of external feedback, and the tennis skills in question require the involvement of large muscle groups due to the"motor transfer" What the student performs from the instep to the wrist of the hand, and this requires neuromuscular coordination, control and control over the way the skill is performed. Therefore, the learner needs relative rest periods during the performance, and this is in line with the nature of the distributed exercise method, and this is consistent with what came (Wajeeh) Mahgoub 2002) indicates that"whenever performance requires many muscle groups, this consumes high energy, and requires great muscle strength, and thus it is advisable to give a sufficient rest period for the purpose of recovery."

Research problem: A new experimental attempt to find out the most appropriate educational methods for training in learning some basic skills in tennis to take the teachers' hand, relying on the results of this study when starting to teach students on it and achieving diversification in the educational process and increasing repetitive attempts to dispel the state of boredom and invest time and effort to achieve Effective and effective learning.

objectives of the research: 1- To identify the effect of the random and sequential exercise method in learning and acquiring the performance of the forehand in the game of tennis. 3- Recognizing the best practice method for learning the forehand in tennis.

Research hypotheses: 1- There are statistically significant differences between the tribal and remote tests among the research groups in learning the forehand in tennis in favor of the post tests.

Research areas:

1-5-1 The human field: Third-year students in the College of Physical Education - University of Diyala for the academic year 2021-2022.

1-5-2 The time range: The period from 01/10/2021 to 3/20/2021

1-5-3 Spatial domain: Tennis courts, Faculty of Physical Education, University of Diyala.

2- Research methodology and field procedures:

2-1 Research Methodology:

I used the experimental method for its relevance to the nature of the research problem.

2-2 The research community and its sample:

The research community included students of the third stage in the College of Physical Education - University of Diyala for the academic year 2021-2022, numbering (90) students and they are divided into three divisions only. (A, B, C), and the researcher excluded the students who failed, and those who had their restrictions, and the teaching teachers, and the practicing students (players of clubs and teams) who numbered (37) students. As mentioned in Table (1).

Table (1)

It shows the distribution of the research sample to the research groups

the people	groups	the number	The independent variable using exercise
Division (A)	The first experimental group	students 20	random
Division (B)	The second experimental group	students 20	serial
Division (C)	third experimental group The	students 20	followed

2-3 Means of collecting information

The researcher collected the information by using the following means:

1- Arabic and foreign sources and references.

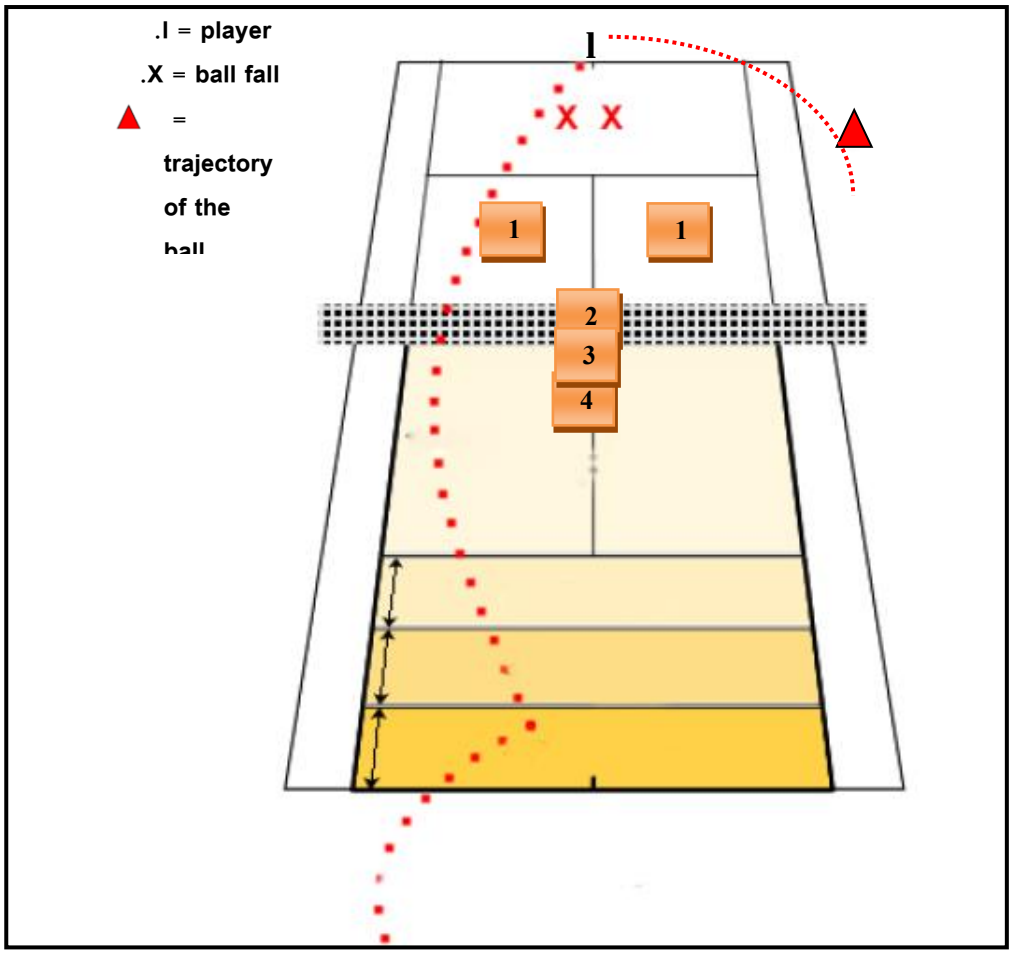
2- A questionnaire form for the opinions of experts and specialists to determine the most important basic skills in the game of tennis.
3- A questionnaire form for the opinions of experts and specialists to determine the paragraphs of the tests related to the game of tennis.
4 - Personal interviews and a survey of the opinions of experts and specialists about field research procedures.

2-4 Tools and devices used in the research:
1- Tennis court (2).
2- Tennis rackets (20).
3- Tennis balls (40).
4- colored ribbon
5- tape measure.
6- Erexon stopwatch, number (3).
7- Figures (15).
8- Tennis court net number (2).
One (1) SONY camera to document the experiment.
10- (5) DVD discs to document the experience.

2-5 Determining the most important tests of basic skills in tennis and the specifications of the tests in question:
After the researcher reviewed some of the sources and research related to tennis skills tests,"Loay Ghanem Al-Sumaidaie and others" (2010) (Loay, 2010) (Loay, 2021, p. 218) After taking into account the level of the sample as beginners, he chose the 2010 International Tennis Federation tests (serving, forehand, and backhand). \ The following is the procedure for carrying out these tests:-
Adequate warm-up and players are ready to start the tests.
The player has the right to play (4 balls) not counted for each test.
The player has the right to reject the ball sent in a way that does not suit him, by not returning it or touching it, but in the case of touching the ball, an attempt is counted for him.
If the ball falls on a line separating two zones, the higher zone score is calculated.
Points are recorded in the registration form after each attempt, and the test taker is the person responsible for the final decision in calculating the points.

2-6 Specifications of the Forehand Kick Test:
The International Tennis Federation relied on the tests prepared in 2010 to measure tennis skills, which were distributed to all federations of the member countries of the International Tennis Federation, which bears the name ITN On Court Assessment. The Federation indicates that these tests are very easy to suit all players in different countries of the world, regardless of their level, especially Beginners and players who do not participate in tournaments and competitions periodically to be an effective tool in evaluating the level of performance of players (2) (itftennis.com).
the test:
Ground Strike Skill Test (Forehand).
The purpose of the test: Measurement and control of ground strokes (forward).
Tools used: 1 tennis racket, 10 tennis balls.

the shape (1)
performance method: stands behind the base line in the middle, ready to hit the balls.



The thrower stands at the center service line on the side of the laboratory and, after instructing, throws the ball into the area between the service area line and the base line.
The recorder observes the performance and scores points.
The tester (10 balls) hits one front and the other back, alternately.
Registration:
Balls that fall outside the individual court will be awarded a score of zero.
For balls that fall within Zone No. 1, one point is awarded.
Two points are awarded for balls that fall within area No. (2).
Three points are counted for balls that fall within Zone No. (3).
Four points are counted for balls that fall within area No. (4).

7-2 Determining the exercises for each of the skills in question:
After reviewing the Arab and foreign sources related to tennis, the researcher chose a set of exercises for each skill (*), then presented them to experts and specialists for the purpose of exploring their opinions, observations and suggestions about modifying, adding or deleting these exercises to determine their validity within the prepared curriculum. The researcher used the Chi-square To indicate its validity, as shown in Table (2).

Table (2)
It shows the identification of some exercises for the proposed forehand for the research

the exercise	Number of approved experts	chi square	validity
1	10	10	✓
2	10	10	✓
3	10	10	✓
4	10	10	✓
5	10	10	✓
6	10	10	✓
7	10	10	✓
8	10	10	✓
9	10	10	✓
10	10	10	✓
11	10	10	✓
12	10	10	✓
13	10	10	✓
14	10	10	✓
th15	10	10	✓

8 - 2Experimental Experiment-:
The researcher conducted the exploratory experiment for a sample of students who are not the research sample, numbering (10) students, for the purpose of knowing the difficulties and problems facing the researcher during the implementation of the tests, and knowing the time that the tests take, as well as the efficiency of the assistant work team, on Sunday 16 /1/ 2021.

9 - 2tribal tests- :
The researcher conducted the tribal tests on the research groups on February 15, 2021: the two experimental groups were tested, and on February 8, 2012 a test was conducted on the control group.

10 - 2The application of educational exercises for exercise methods and with each skill-:
After selecting the special exercises for each skill, Ashraf the researcher applied the special educational exercises for each experimental group of the research groups, while the control group used the method adopted by the teacher and it was implemented for the period from 16 /2/ 2021 to 12 / 3 / 2021 as follows-:
A - The first experimental group: studied according to a random exercise.
B - The second experimental group: studied according to the sequential exercise.
C - The control group: It was studied by the used method.

11 - 2Statistical means
performed statistical treatments for the data obtained by using the statistical bag (Ayed, 2009, p. 211) SPSS, Which:-
Arithmetic mean.
Mediator.
skew modulus.

standard deviation.
Ka2.
(T) for correlated samples.
(T) for independent samples.

-3Presentation, analysis and discussion of the results
1-3Presenting and analyzing the results of the pre and post tests for tennis skills:
Below is a presentation of the results of the tribal and post tests of the technical performance of the forehand skills b Tennis for each of the research groups after performing the appropriate statistical treatments, as shown below.

Table (3)
It shows the arithmetic means and standard deviations of the pre and post forehand tests of the research groups.

T	Statistical parameters / groups	Measurement units	tribal arithmetic mean	Tribal standard deviation	The arithmetic mean dimensional	standard deviation dimensional
1	The first experimental group (randomly)	Degree	2.000	1.622	3.400	0.598
2	The second experimental (group (series	Degree	1.500	1.504	3.200	0.768
3	control group	Degree	1.300	1.380	3.150	0.813

Table (3) shows the arithmetic means and standard deviations of the pre and post tests of the forehand for the research groups. The arithmetic mean and standard deviation of the pretest for the first experimental group (random) were (2,000, 1.622). And for the post-test (3.400, 0.598). For the second experimental group (sequential), the arithmetic mean and standard deviation for the pre-test reached (1.500, 1.504), and for the post-test (3,200, 0.768). For the control group, the arithmetic mean and standard deviation for the pre-test were (1.300, 1.380), and for the post-test (3.150, 0.813). Through this presentation, we note that there are different differences in both the pre and post tests.. that is, there is a change and differences obtained from the researcher's application of the exercise methods as well as the method followed by the subject teachers of the control group.. These differences are apparent in a descriptive form as shown in the previous table, as we note The difference is between the arithmetic mean values of each of the three groups.

Table (4)
It shows the values of the arithmetic mean differences, standard deviations, and the significance of the differences between the pre and post tests in the t -test and the effect size for measuring the forehand

T	Statistical parameters groups	Average rencediffe s in arithmeti c mean	standard deviation of difference s	valu e(t)	Tabula r value (t)	Indicatio n level	Statistical significanc e	Impact size learning) (
1	The first experiment al group ((Constant	1.850	1.725	4.79 6	2.093	0.05	D	%74
2	The second experiment al group the) (variable	1.700	1.593	4.77 3			D	%74
3	control group	1.400	1.698	3.68 7			D	%65

Table (4) shows the calculated (t) value and the effect size (learning) between the pre and post tests of the forehand strike test, as the first experimental group (random) reached (4.796), and the effect (learning) was (74%). And for the second experimental group (sequential) (4,773), and the effect size (learning) was (70%). And for the control group (3.687), the effect size (learning) was (65%). It is higher than the tabular t (2.093) with a level of significance (0.05) and a degree of freedom (19), and it is statistically significant. Through this presentation, we notice that there are different differences in both the pre and post tests.. that is, there is a change and differences that occurred from the researcher's application of the exercise methods as well as the method used by the subject teachers of the control group.. These differences are apparent in a descriptive form as shown in the previous table, as we note The difference is between the calculated (t) values and the effect size (learning) for each of the three groups.

3-2 Discussing the results of the value of (t) and the size of the effect between the tribal and remote tests of the tennis skills of the research groups

Through Tables (3), (4) The results showed that there were significant differences in the value of (t) calculated between the tribal and post tests of the basic skills in tennis (the front kick), and these differences were in favor of the post tests, and from what was mentioned above, it appeared that all methods had a positive impact on learning the technical performance of tennis skills subject. Research, and to find out which of the methods is more effective and has preference in this effect, we shed light on what was mentioned in the previously mentioned tables, as those tables show us the significant differences between the two methods and the method used and used in each of the variables included in the research, as it appeared that there are significant differences The reason for this effect is that the extent of the effect of these methods led to a state of interaction between the teacher and the student, which increased the student's contribution to the positive participation in the lesson and increased the student's eagerness to learn. It led to an increase in the students' practice of the vocabulary of the curriculum prescribed in the college, which led to an improvement in the learning process, and (Shamt 1982) indicates that"for the purpose of obtaining learning, there must be attempts to practice Exercise, and the most important variable in kinesthetic learning is kinetic practice and the exercise itself" (Schmatt 1982). The researcher attributes the reason for this

to the effectiveness of the exercises used in different methods (exercise scheduling), as each method has its own advantages that distinguish it from other methods, and this was evident in the varying ratios of the effect size for learning, that is, the methods used require regulating the kinetic rhythms of the skill, which leads To regulate the neuromuscular compatibility, as well as isolating the non-working muscles, and not dispersing the movement, and this will work to match the plan with the educational curriculum prepared by the teacher using a variety of exercises according to the methods used, as the accuracy of performance is an"important requirement" on which victory depends, it is The desired goal in performance is to score points, if the final outcome is measured for fast and strong performance and there is no benefit from it if it lacks accuracy) (Mohammed Sobhi, 1997, p. 21) and this corresponds to what came from the results shown in the previously mentioned tables. This agrees with (Abbas Al-Samarrai, 2000), as"every systematic learning aims at rapid progress in both the physical and mental aspects, and the increase in the motor learning (technical) of the human being." One of the things that the teacher seeks when teaching any skill is to reach the learner to a high level of skill performance and implementation by following the appropriate method that would raise the learner (the student) to the required level through the use of multiple methods in which the exercises are organized and scheduled in proportion to the type of skill requirements, as well as learners' abilities and capabilities. And (Osama Kamel Ratib, 1997) stresses that"learning any skill through practicing various exercises must be done through the correct practice of the skill in conditions similar to the competition and focus on the accuracy of performance using the optimal use of practice time and with high efficiency." And the selection of exercises for any method of learning has a great place in various sports and sports activities, including tennis, because it is the basis for reaching the peak of art in the performance and mastery of the skill from the learners. and influential. The selection process is a somewhat complicated task. Only the teacher can determine the method that suits his educational unit and his students. Each method has its own curriculum, and there is no specific method that suits all learners or suits all circumstances. By following the method of random exercise, the performance of the skill from a position of stability ensures its performance with good accuracy and this is related to the balance that occurs when performing that skill. Performing it in unbalanced positions and with different movements" (Mohammed Sahbi, 1988, p. 365), in addition to the fact that the stability of the positions that the learner performs in the opponent's court and training on them will undoubtedly raise the level of accuracy. And the change in the places where the ball is hit, whether by sending or the forehand or the backhand, and the change in the places of directing to the opponent's court are suitable conditions for the random exercise method (which is the best method in the later stages of learning, for what it achieves in creating programs and kinetic laws that the learner can benefit from). And it helps him to perform that skill under the conditions of the game or the match, as the performance must take place from different places, angles and directions (Amer Rashid, 1998, p. 78). The function of random exercise is to develop the performance plan and the development of the motor program, and that the individual acquires a motor plan through exercise, but the random exercise increases the development of this plan, in addition to the fact that the learner performs new types of duty more efficiently than the fixed exercise, and increases flexibility in performing the skill. And the sequential exercise can provide a good opportunity for the student to examine and self-review, and over time, it creates an incentive for the student to provide feedback as well as conscious use of external feedback, and the tennis skills in question require the involvement of large muscle groups due to the"motor transfer" What the student performs from the instep to the wrist of the hand, and this requires neuromuscular coordination, control and control over the way the skill is performed. Therefore, the learner needs relative rest periods during the performance, and this is in line with the nature of the distributed exercise method, and this is consistent with what came (Wajeeh) Mahgoub 2002) indicates that"whenever performance requires many muscle groups, this consumes high energy, and requires great muscle strength, and thus it is advisable to give a sufficient rest period for the purpose of recovery." And (Magill, 1998) indicates that"the benefit of exercise is The variable is to increase the learner's experience, improve performance, and increase

the ability to perform the skill in the future, in different locations on the playing field. And gain more experience in performance and can adapt to the new conditions in which the backward sites are characterized. One of the teacher's priorities in scheduling and organizing the exercise through the weekly educational units is to determine the amount of practice and the amount of rest, and this is done through two types of exercises, namely, the random exercise method, which gives a relatively low rest rate between attempts, for example, if the amount of practice for an attempt is (30) Then you can give a rest time of (5) seconds. Or maybe even less. As for the sequential exercise, the rest ratio between attempts is equal to or greater than the amount of exercise, for example, if the amount of exercise is (30) seconds, then a rest of (30) seconds or a little more is given, and there are no red lines separating the random exercise and Sequential, but the difference is that in the random exercise, the rest period is reduced between attempts, while in the exercise and sequential, greater rest is granted between attempts. (Schmatt 2004), and giving the appropriate opportunity for optimal performance significantly, and this helped to control the movements of the tennis skills in all its parts close From the actual performance, as"the use of various applied organizational exercises and in different educational modes helped the learner to control and control the performance requirements...and choose the appropriate effectiveness of the method and increase repetitive attempts, which are among the basic requirements for learning." (Dhafer Hashem, 2002, p. 104)

Conclusion

Among the most important conclusions reached by the researcher:

1- The scheduling of the random and sequential exercise and the method followed had a"positive" effect on learning the forehand in tennis.
2- There is a preference between the pre and post tests of the research groups in learning the forehand in tennis. It is in favor of dimensional tests.
3- There is a preference for the method group (sequential) in learning the technical performance of the skill of the forehand over the rest of the methods.

Among the most important recommendations recommended by the researcher:

1- The necessity of scheduling the exercise with the methods (the subject of the research) in learning tennis skills and the extent of their effectiveness in achieving the best learning for these skills.
2- Focusing on the use of the (sequential) method in learning the skill of the forehand strike because of its effective impact on learning these skills for this group of learners.
3- Experimenting with other methods of exercise in learning the skills (the subject of the research) or other skills for individual or group games.
4- The use of pictures and illustrations in the physical education lesson because of its great importance in linking the sense of hearing with sight, which leads to the acceleration of learning the motor skill.

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Supplements

The educational exercises for the forehand_

T	exercise name	Relative importance				
		1	2	3	4	5
1	the purpose of which is to develop ball ,Ball dribbling and hitting exercise control.					
2	The exercise of hitting the ball depending on the number and its purpose is to go towards the falling ball. The players who throw the ball stand on and (6-5-4-3-2-the side line of the field and according to their numbers (1 and the player with the ,(6-gher than (1the player throws the ball to hi racket must go to the location of the ball and hit it over the net and return to thebaseline.					
3	Group exercise Hitting the ball from the individual transmission area, ect distance in the competitionpracticing hitting the ball from the corr.					
4	Simple volleyball exercise. It is intended to apply the feel of volleyball.					
5	The swing exercise, its purpose is to encourage the swing when hitting the meters from the 3-ball to the ground, as the players stand at a distance of 2 wall and the player hits the ball very hard against the wall for the purpose .rrectlyco of performing the swing					
6	team exercise to throw the ball by hand, and hit it with the racket, to practice hitting the ball with the forehand ground kick.					
7	An accurate long ball hitting exercise intended to encourage accurate, strokes deep long.					
8	Continuity and sequence building exercise, the purpose of which is to In the beginning, the ball is hit .develop consistency and increase its time twice, then four, then six, then eight, then ten To reach the desired for other players number, and then complete the exercise					
9	Continuity and running exercise: Its purpose is a game of entertainment and stability in repelling the ground strike with movement.					
10	Maintenance exercise of 10 strokes. The purpose of it is simple, and movement to the marked points on the ,sustainable development ground.					
11	Numbered goals exercise: Its purpose is to develop the player's accuracy. The coach throws the ball to the player, and calls out the goal number on .(are predetermined the opposite side (the coach's side and the goals					
12	The goal exercise to develop the shooting at the site of the hit and on a .specific point and to go to the other side of the playing field					
13	Depth perseverance exercise to develop a frontal strike, which reaches the .depth, and the play is on a certain number of points					
14	doubles exercise in the box, to develop the principle of stability by -Cross continuity-cross.					

th15	Volleyball throwing and hitting exercise, with 5 blows from the player holding the racket, and all the players perform backwards and who is not forwards when performing.					