

Research Paper



Impact of Triple Interference Exercises Between Scheduling Methods (Random, Variable and Intensive) in Skill Development and Scoring Accuracy for Futsal Players

Sadiq Jafar Sadiq¹ , Mohammed Ghani Hussein¹ , Mayyadah Khalid Jasim¹

1. Department of Physical Education and Sports Sciences, Al-Mustansiriya College of Basic Education, Baghdad, Iraq.



Citation Sadiq SJ, Hussein MG, Jasim MK. Impact of Triple Interference Exercises Between Scheduling Methods (Random, Variable and Intensive) in Skill Development and Scoring Accuracy for Futsal Players. *Iranian Rehabilitation Journal*. 2023; 20(2):185-194. <http://dx.doi.org/10.32598/irj.20.1.1715.1>

doi <http://dx.doi.org/10.32598/irj.20.1.1715.1>

**Article info:**

Received: 20 Feb 2022

Accepted: 14 May 2022

Available Online: 01 Mar 2023

Keywords:

Futsal players, Exercise scheduling, Scoring accuracy

ABSTRACT

Objectives: This study aimed to prepare an educational program based on the overlap and the integration of the random exercise, the variable exercise, and the intensive exercise methods adapted to the capabilities of the research sample. We intended to recognize the effect of this educational program on developing the skill performance and scoring accuracy of the research sample in the futsal game.

Methods: This study was conducted on 20 futsal players during the 2016-2017 sports season. The study setting was Balad Sports Club in Salah El-Din Governorate, Iraq, and the research sample was divided into two groups: experimental and control (each group with 10 players). Data collection tools were tests of skill performance and scoring accuracy. The obtained data were analyzed by t test for paired samples.

Results: After 8 weeks of implementation of the educational program, scores in both skill performance and scoring accuracy tests were significantly improved.

Discussion: Based on these results, the researchers concluded that the triple overlap exercises positively affect the skill performance and accuracy of scoring for futsal players.

*** Corresponding Author:**

Sadiq Jafar Sadiq, PhD

Address: Department of Physical Education and Sports Sciences, Al-Mustansiriya College of Basic Education, Baghdad, Iraq.

Tel: +96 (479) 01854542

E-mail: alsadiqjafar1975@gmail.com

Highlights

- This study aims to prepare triple overlap exercises for better performance of futsal players.
- Compared to each random, variable, and intense exercise alone, triple overlap exercises may significantly improve skill performance and improve scoring accuracy for futsal players.
- This study is one of the few studies that relied on the interaction of three exercise methods.
- Most studies have relied on one or more methods without overlapping each other.
- Other studies relied on the bilateral interaction between two different methods of scheduling exercise.

Plain Language Summary

Few studies relied on the triple overlap between methods of scheduling exercises as a training method for futsal players. However, we find many studies that dealt with one or more scheduling methods separately to learn five soccer skills. Also, many studies relied on bilateral intervention to develop the skill performance of futsal players. We aimed to prepare an educational program based on interaction and integration between the random exercise, the variable exercise, and the intensive exercise methods matched with the capabilities of the research sample. We identified the impact of the educational program on the development of performance skills and accuracy of registration for the research sample in the futsal game. The research sample represented Al-Balad club futsal players (20). The players were divided into two groups: one experimental and one control group, each with 10 players. The educational program was applied to the experimental group for 8 weeks, 3 educational training sessions per week. After processing the results with SPSS version 17.0, the researchers concluded that the proposed educational program positively impacts the development of skill performance and scoring accuracy for futsal players. The researchers recommend the use of the proposed educational program.

1. Introduction

The learning and development process requires the trainer to be a suitable model. He must present the skills he wants to teach and train. The trainer has to use effective methods and means that work to accelerate the learning process in quantity and quality. That is why we find that specialists in kinetic learning exhaust themselves in developing designs to schedule exercises and facilitate the possibility of assimilation. They enhance the learning process and make it effective after explaining to them through experiments, and re-exercise alone ensures a more lasting behavior. In contrast, effective design connects the learner to integrating skills [1].

These diverse organizational variables of exercise scheduling are influential. It is crucial to understand how they affect the creation and dissemination of the kinetic program [2]. The attempt to interplay and integrate these designs is an educational way to create an effective design that can popularize a kinetic program. Recent re-

search suggests that the principle of replay or repetition alone does not guarantee skill development but is a continuity process in kinetic behavior. These organizational variables to carry out the exercise are influential and should be understood. However, it is extremely difficult and complex to understand their impact on learning and how to deal with them [3].

This issue highlights the importance of this research on how to take advantage of triple interference and integration between exercise scheduling designs. We used the overlap and integration between the random exercise, the variable exercise, and the intensive exercise methods.

Most research on exercise scheduling methods was based on either one or more methods of exercise schedule, and each group took a specific method. These groups were compared according to the method they learned without any overlap between these methods, like the Ashour, Nashmi, Thabet [4], Al-Kufi study [5] or studies on the overlap between two methods of scheduling the exercise, like Sadiq and Abdul-Karim [2], studies.

Through the experience and work of the researcher as a trainer and teacher for this game, it was found that we need to take different approaches to develop the learning process and raise the level of skill performance for this game by developing exercises that overlap three different ways of scheduling the exercise.

2. Materials and Methods

The researchers used the experimental method for its suitability and the nature of the research problem. The research community comprised Balad Sports Club players in the 20-player futsal game for the 2016-2017 sports season. The experimental research sample was randomly selected from the research community through the lottery system. The cards with numbers 1 to 20 are placed in a box. The players were asked to take one card. The players who took the even numbers were chosen as an experimental group, and those who took the odd numbers were chosen as the control group. The number of each group was 10 players for each group, and this number represented (100%) of the research community.

Sample homogeneity

To determine the homogeneity of the research samples in the length, weight, and age variants of the training, the researcher used the twist coefficient that showed the homogeneity of the search sample, as shown in Table 1.

Search tools and auxiliary devices

Data collection tools

The Researcher used the following research tools:

- Arab and foreign resources.
- Personal interviews.
- Observation and experimentation.
- Data collection form and unpacking research information.
- Tests and measurements.

Table 1. Homogeneity of the study samples

Variables	Mean±SD	Mediator	Skew Modulus*
Length (cm)	176.8±3.1	177	-0.098
Weight (kg)	72.65±6.69	72.5	0.275
Age of training (mon)	42.6±11.33	36	0.257

* Value of skew modulus (± 3).

The researcher benefited from the devices and auxiliary tools, which were

legal soccer balls and figures with various heights inside the field, adhesive tapes, measuring tapes in parts of a meter, stopwatches, and an electronic scale.

Field research procedures

Identification of research tests

First test [3]:

Test name: Skill performance test

Aim of the test: Measuring skill performance in Futsal.

Scoring: calculating the total performance time of the player on the three test stations, and the best is the least time.

Hardware and Tools

- A soccer field for futsal,
- Smooth fence: an area of 1.30 m x 2.20 m, and a line in front of the wall at a distance of 5 m,
- A soccer goal for the five-a-side ball according to legal standards, divided into 6 equal sections by iron or wooden cutters or thick ropes;

Colored adhesive tape to identify and identify the test areas;

Two 2 hours of arrest (Siyuan) of Chinese origin;

Whistle No. 2, and;

Ten legitimate footballs for the halls and 7 shapes.

Test description

The tester stands on line (A) in the standby position.

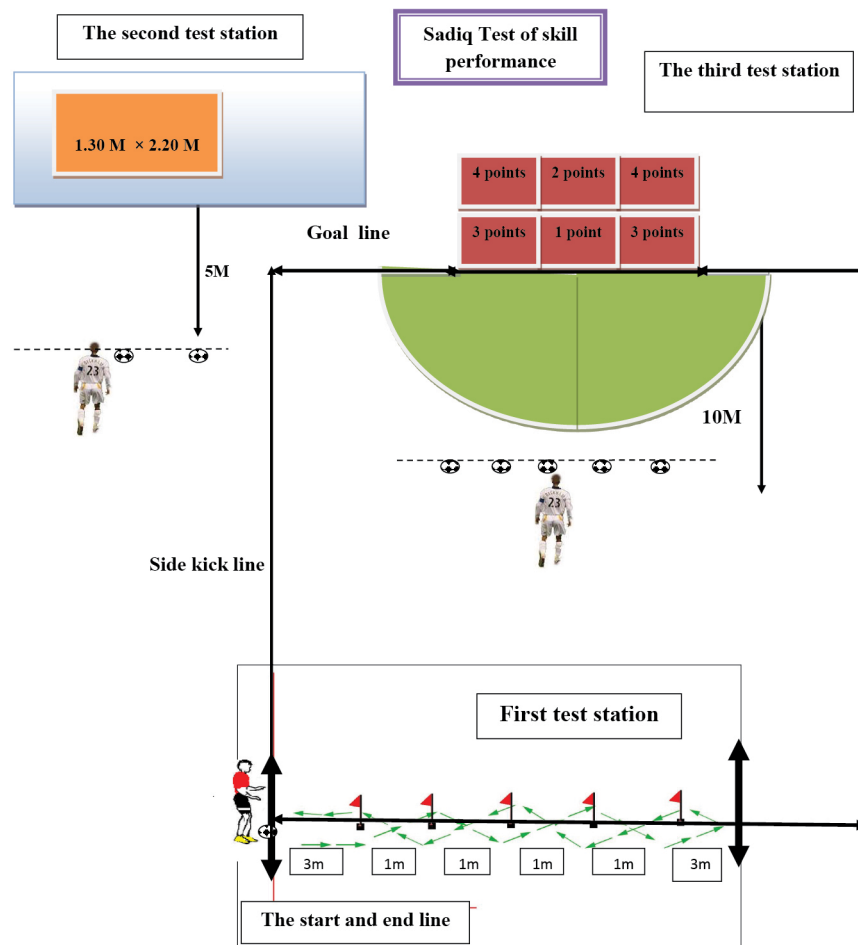


Figure 1. Skill performance test

- When the tester hears the start signal from the test manager (a beeping sound), he rotates the ball straight for a distance of 3 m until he reaches the first five turns between them. In any way he chooses, the tester spins, and after the fifth person passes the ball directly to the shaft, the seventh spins, turn it, returns the ball to the five columns for a zigzag roll, and then finishes the ball at the starting point.

- The test device leaves the ball after passing line (A) and moves towards the second test station, the recoil processing station, starting from line (B) on the line. On the line or after passing 20 s after the end of 20 s, he leaves the ball and runs towards the third test station, which is the scoring station located in the goal near the handling station, at a distance of 2 m from the side kick line from the half-court position to share. The lab shoots the balls placed on the line of the second recording area 10 m towards the goal, which is 5 balls, one of which is placed on the second penalty mark, and 2 a ball on its right side. Furthermore, the same on

the left side, one space from the other 50 cm, with the end of the fifth ball, the test ends.

Scoring method

- The work of the recorder is to record the time taken by the tester from the moment they heard the whistle until the moment the fifth ball is kicked by the tester at the recording station, as well as recording the number of correct manipulations at the bouncing station and the number of points obtained at the recording station according to the previously prepared recording form.

- The test manager decides the number of correct treatments according to the conditions of their implementation, as well as the number of points that the tester gets.

When the ball enters squares 1 and 5, the tester gets four points;

When the ball enters squares 2 and 6, the tester gets three points;

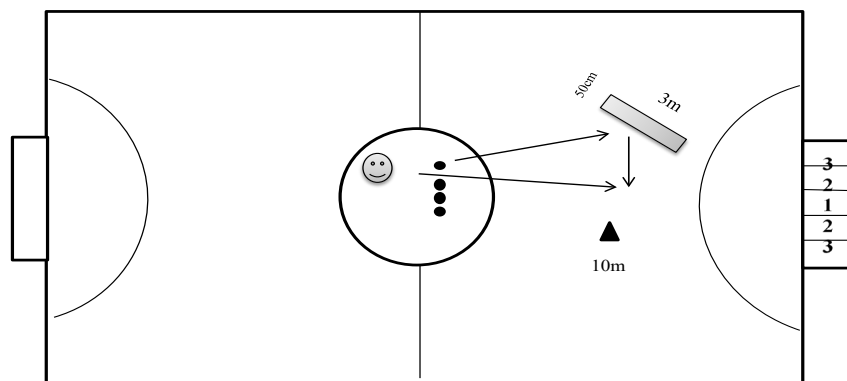


Figure 2. Scoring test

When the ball enters the box 3, and 4, the tester gets two points and one point, respectively.

After the results are scored, the manager deducts 1 s from the total performance time for each point earned by the tester at the scoring station and also deducts 1 s for each correct treatment after the ninth, 1 s increase for each treatment less than 9 handles, plus 1 s increase over the total performance time for each touch and movement of the five spindles.

- The function of the timer is to record the timing of the total performance, handling, and passing of the ball (Figure 1).

Second test [4]:

Test name: scoring after the bounce of the ball from a Swedish court from 10 m

Aim of the test: To measure the accuracy of scoring.

Scoring: Three attempts are given to the tester to gain points according to the location.

Used Equipment

The needed equipment comprised a futsal soccer ball, a wooden bench, a length of 3 m, a height of 50 cm, a goal divided into 5 flexible sections, a whistle, and a scoring form.

Performance method

The tester stands with the ball at the center line and then passes the ball to the platform that is on the side, allowing the ball to be returned and prepared for the laboratory at a person 10 m away from the goal, after which he scores on a goal divided by degrees (Figure 2).

Scoring

The tester is given 4 attempts, scoring points according to the location.

A pilot experiment

The researchers conducted a pilot test on 7 players outside their research sample. This experiment aimed to ensure the validity of the devices and tools used in the research and the team’s understanding and efficiency in conducting the tests, recording the results, and determining the time required to conduct the tests. They also wanted to be ensured of the suitability of the test, testing the sample members and their arrangement, knowing the possible obstacles, avoiding errors and interference in the test and making sure of the scientific conditions of the test.

Table 2. Statistical parameters of the tests (persistence coefficient, self-truthfulness coefficient)

Test Name	Unit of Measurement	Stability Coefficient	Self-truthfulness Parameter
Skill performance test	Second	0.82	0.91
Scoring after the bounce of the ball from a Swedish court from a distance of 10 m	Degree	0.89	0.94

Scientific basis of the tests

When the tests were determined, and after conducting the pilot test, the researcher sought to find the scientific foundations of the selected tests as follows:

First: test reliability

To assess the test reliability, the test-retest method was adopted. The tests were applied to the sample of the survey experiment, and the same tests were repeated after 3 days. Then, the data obtained by the researcher from the two tests were processed by calculating the Pearson simple correlation coefficient between the scores of each test. The calculated correlation results showed a high correlation between most of the tests. The method confirmed the reliability of the tests (Table 2).

Second: tests validity

The researchers used the subjective validity coefficient, which is an indicator of the stability or correlation between the observed scores in the test and the real results. That is, the experimental scores of the test are attributed to the true scores free from measurement errors [6] to confirm the test’s reliability and measure the subjective validity by calculating the square root of the test reliability coefficient:

$$\text{Subjective reliability coefficient} = \text{square root of the test reliability coefficient.}$$

The approved tests were clear and understandable and far from the self-evaluation of the assessor, as the scoring is carried out by adopting the units of time and the number of times of success (grade), and the instructions for each test were clearly defined [7, 8]. The necessary conditions were established during the application, as well as the fact that the team of assistants specialized in physical education, and thus the approved tests are highly objective.

Pretest

Pretest was conducted on the research sample before starting the implementation of the educational program to determine the level of skill performance and accuracy of scoring in the research sample, as the tribal test of the two research groups and in the Indoor Games Hall of Balad Sports Club.

Educational curriculum

When the researchers completed the pilot test and the pretest, they prepared a special educational program for the research sample based on the triple overlap between the methods of exercise scheduling (random, variable, intensive). The overlap is integrating the designs of the exercise schedule, which is nothing but an increase in the complexity of performance for the learner. The goal is to increase the input of forms of exercise that improves retrieval and transfer by forming a new exercise design. It bears the features of the exercise designs from which it was derived. Therefore, the instructions for implementing this new design will include all the instructions of those designs, and not every overlap that has been successful in a sport is successful in all activities. Each sporting event has a specificity that distinguishes it from other sporting events. The tutorial application included 24 educational 90-min sessions, 3 sessions per week.

Posttest

After the end of the educational program, which took 8 weeks, the posttest was conducted and followed the same conditions and procedures that were followed in the pretest to control the variables that affected the results of the experiment.

Statistical Methods

The researchers used SPSS to process all the research data for statistical analyses of simple correlation coefficient (Pearson), mean, median, standard deviation,

Table 3. Results of the pretest and the posttest of the experimental group for the research tests

Research Tests	Unit	Mean±SD		Counted t-value	Sig.	Improvement
		Pretest	Posttest			
Skill performance test	Time	57.32±3.91	46.43±3.99	21.037	0.0000	18.99%
Scoring accuracy test	Degree	4.5±1.35	7±0.94	-4.607	0.001	35.71%

* At the degree of freedom (N-1=9) at a significance level of 0.05.

Table 4. Results of the pretest and the posttest of the control group for the research tests

Research Tests	Unit	Mean±SD		Counted t-value	Sig.	Improvement
		Pretest	Posttest			
Skill performance test	Time	56.21±3.88	50.28±3.70	7.28	0.0000	10.54%
Scoring accuracy test	Degree	3.60±0.96	4.50±0.84	-9	0.000	20%

* At the degree of freedom (N-1=9) at a significance level of 0.05.

Iranian Rehabilitation Journal

Table 5. Results of the posttest for the experimental and control groups of the research tests

Research Tests	Unit	Mean±SD		Counted t-value	Sig.
		Experimental Group	Control Group		
Skill performance test	Time	46.43±3.99	50.28±3.7	-8.037	0.000
Scoring accuracy test	Degree	7±0.94	4.5±0.84	5.238	0.001

*At a degree of freedom (N1+N2-2=18) at a significance level of 0.05.

Iranian Rehabilitation Journal

torsion coefficient, t test for correlated samples, law for non-correlated and equal number (independent) samples.

3. Results

Pretest and Posttest Results of the Experimental Group

The researchers used the t test for the correlated samples (Table 3).

According to Table 3, the results of the experimental group in the tests of skill performance and scoring accuracy were significant, and improvement was recorded in both tests.

The Results of the Pretest and Posttest of the Control Group

The researchers used the t test for the correlated samples (Table 4).

According to Table 4, the results of the control group in the tests of skill performance and scoring accuracy were significant, and improvement was recorded in both tests.

Discussion of the Results of the Posttest of the Experimental and Control Groups

The researchers extracted t values for all the dimensional tests of the two research groups to determine which of the two groups was more affected by the program and its methods (Table 5).

4. Discussion

According to Tables 3 and 4, there is an increase in all the study variables. These results confirm the ability of the educational program to develop the level of skill performance and accuracy of scoring for the members of the research sample. However, the rates of development achieved by the experimental group were greater than those of the control group. According to the researcher, this progress in skill performance and targeting accuracy of the experimental group was mainly due to the education program based on overlap and integration of exercise scheduling methods. Schmidt argued that both random and variable exercise could be combined and standardized to produce a longer-term learning acquisition because learners who practice multiple differences in one movement and with a random system can better generate different sizes for the scale. In this way, in a scheduling system, people sometimes gain more experience in learning than each method alone [9].

The research sample belonged to the category of players, so the effect of merging the third method, which is the intensive exercise method, with the other two methods (random-variable) was great. Also, the research sample interacted positively with this triple interference as it simulates what players may be exposed to during the competition from the continuous transition from one kinetic program to another under the pressure of time and competition, as well as fatigue. In addition, Dhafer Hashem said that “the overlap in educational methods increases the learner’s experience and fulfills the requirements of the lessons and the learner, and leads to

the development of the learner's perspective and an increase in his ability to control performance and its changes" [10] which is similar to what was Wing Arnoff mentioned by Quoting Mustafa, "One of the benefits of scheduling the exercise is to make the acquired information active while learning kinetic skills" [11]. As for the improvement in the performance skills and the accuracy of scoring for the experimental group, the researchers attributed this improvement to the program that was applied to them and its ability to bring about development in performance and scoring. This program is not set and approved arbitrarily but by those in charge of the management and training of the said club. This program results from the accumulated experiences of those working in this sports area.

According to Table 5, the experimental group's results in the two tests of skill performance and scoring accuracy were better than the control group. Thus it becomes clear that the experimental group to which the triple interaction program was applied was better than the control group. The reason for the significant differences in skill performance and scoring accuracy after the educational program is the overlap between the random and variable exercise that leads to the best learning. This finding corresponds to the findings of the previous study that "the overlapping design of the (random variable) exercise schedule gives the best learning" [11]. Also, The more similar the exercises to a real game, the more positively they affect the acquisition of basic football skills. Repetition of these exercises leads to the acquisition of some basic skills and thus their strengthening and development [12].

The researchers faced several problems that affected the results of their research. The most important was the lack of a sufficient number of sample members, as it was limited to members of one sports club. It would have been better if a sample was available from more than one club so that the players of the entire club become an experimental group and the players of another club as a group.

5. Conclusions

The proposed educational program based on the triple interaction between random, variable, and intense exercise positively affects skill performance and scoring accuracy in futsal football under study. It was found that both groups achieved significant differences between the pretest and posttest in all the variables under study. The best group that developed in skill performance and scoring accuracy was the experimental group, in which the

triple overlap approach was applied between random, variable, and intense exercise.

The researchers suggest using the proposed educational program to develop the skill performance and accuracy of futsal soccer scoring by all coaches and specialists in this field. Also, they recommend using multiple designs to overlap exercise schedules and design other educational programs in learning some basic skills in futsal and the possibility of conducting research using the overlap of exercise scheduling in (closed and open) skills in football or other games.

Ethical Considerations

Compliance with ethical guidelines

The Ethics Committee of the Faculty of college of basic education University of AL-Mustansiriya, Iraq (Code: 3795).

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgments

We hereby express our gratitude to the Student Research Committee of Balad sport football club who helped us in conducting this research.

References

- [1] Dehghan L MN, Rezaee M, Tabatabaee M. The relationship between fine motor skills and social development and maturation. *Iranian Rehabilitation Journal*. 2017; 15(4):407-14. [DOI:29252/nrip.irj.15.4.407]
- [2] Sadiq SJ, Abdulkarim MH. [The interference effect of the random and varied practice style according to the principle of generalization of motional programs and the type of feedback in learning some basic skills for the F.U.T.S.A.L (Arabic)]. *Dirasat: Educational Sciences*. 2017; 44(4):135-55. [Link]

- [3] National Research Council, Division of Behavioral and Social Sciences and Education, Center for Education, Board on Science Education, Committee on Learning Science in Informal Environments. Learning science in informal environments: People, places, and pursuit. Washington: National Academies Press; 2009. [\[Link\]](#)
- [4] Ashour AA, Nashmi MH, Sabit MH. [The effect of random distributed variable method interference on developing agility and rolling skill for young football players (Arabic)]. Journal of the College of Basic Education. 2020; 136-46. [\[Link\]](#)
- [5] kufi HA. [The effect of sequential and random exercise on the accuracy of performance of some tennis and badminton skills among athletes of sports talent schools (Arabic)]. Journal of the College of Basic Education. 2020; 20:37-46. [\[Link\]](#)
- [6] Radwan MN. Introduction to measurement in physical education and sports. Cairo. Book center for publishing; 2006. [\[Link\]](#)
- [7] Sadiq S. Designing a test to measure sport skill performance for futsal. The Swedish Journal of Scientific Research. 2016; 3(6):1-8. [\[Link\]](#)
- [8] Cejudo A, Sainz de Baranda P, Ayala F, Santonja F. Test-retest reliability of seven common clinical tests for assessing lower extremity muscle flexibility in futsal and handball players. Physical Therapy in Sport. 2015; 16(2):107-13. [\[DOI:10.1016/j.ptsp.2014.05.004\]](#) [\[PMID\]](#)
- [9] Schmidt RA, Wrisberg CA. Motor learning and performance. Champaign: Human Kinetics; 2000. [\[Link\]](#)
- [10] Hussain LDQM. [The effect of the "Learn together" cooperative strategy on learning some basic tennis skills among students (Arabic)]. Sciences Journal of Physical Education. 2020; 13(8):388-400. [\[Link\]](#)
- [11] Azimi K, Ahmadigol J, Rastegarpour H. A survey of the effectiveness of instructional design ADDIE and multimedia on learning key skills of futsal. Journal of Educational and Management Studies. 2015; 5(3):180-6. [\[Link\]](#)
- [12] Salman TD, Ashour AA. [The effect of exercises similar to playing according to the distributed style in learning some skills of soccer for second grade intermediate students (Arabic)]. Karbala Journal of Physical Education Sciences. 2021, 6(3):154-64. [\[Link\]](#)

This Page Intentionally Left Blank