THE EFFECT OF RANDOM AND BLOCKED PRACTICE ON TENNIS BASIC SKILLS AMONG UNIVERSITY STUDENTS

ALI AHMED HAMEED AL. AZZAWI

FACULTY OF EDUCATION
UIVERSITI MALAYA
KUALA LUMPUR
2020

THE EFFECT OF RANDOM AND BLOCKED PRACTICE ON TENNIS BASIC SKILLS AMONG UNIVERSITY STUDENTS

ALI AHMED HAMEED AL. AZZAWI

DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOr THE DEGREE OF MASTER OF EDUCATION (PHYSICAL EDUCATION)

FACULTY OF EDUCATION

UNIVERSITY OF MALAYA

KUALA LUMPUR

2020

UNIVERSITY MALAYA

ORIGINAL LITERARY WORK DECLARATION

Name of Candidate: Ali Ahmed Hameed AL.Azzawi

Registration/Matric No:17012681

Name of Degree: Master

Thesis: The effect of Random and Blocked Practice on Tennis Basic Skills among University Students

Field of Study: Physical Education

I do solemnly and sincerely declare that:

(1) I am the sole author / write of this Work;

(2) This Work is original;

(3) Any use of any work in which copyright exist was done by way of fair   dealing and for permitted purposes and any excerpt or extract from, or reference to or reproduction of any copyright work has been disclosed expressly and sufficiently and the title of the Work and its authorship have been acknowledged in this Work;

(4) I do not have any actual knowledge nor do I ought reasonably to know that the making of this work constitutes an infringement of any copyright work;

(5) I hereby assign all and every rights in the copyright to this Work to the University of Malaya ("UM"), who henceforth shall be owner of all the copyright in this Work and that any reproduction or use in any form or by any means whatsoever is prohibited without the written consent of UM having been first had and obtained;

(6) I am fully aware that if in the course of making this Work I have infringed any copyright whether intentionally or otherwise, I may be subject to legal action   or any other action as may be determined by UM.

Candidate's Signature   Date

Subscribed and solemnly declared before,

Witness's signature   Date

Name:

Designation:

ABSTRACT

The purpose of this study was to investigate the effect of two different practices (Blocked & Random) on learning tennis basic skills (Forehand & Backhand) for Iraqi university students. A total of 90 students participated in this study. The study was conducted using quasi-experimental research design where tennis basic skills tests was administered to the students before and after the treatment process. The students were divided into three groups of 30 students each group. For the experimental groups, blocked practice was assigned to the first group while blocked practice was assigned to the second group. The controlled group followed traditional practice. The results after 12 weeks of treatment showed that the groups that followed (Blocked & Random practice) scored significantly higher than the group that followed traditional practice in learning tennis basic skills. In conclusion, the results of the current study showed that blocked and random practice are effective to a large extent in learning forehand and backhand in tennis. The study supports the effectiveness of blocked and random practice for Iraqi university students. Implications of this study, this study is very important as it presents a substantial evidence regarding the facts that practice scheduling can significantly and positively affect the educational level of the university level students.

KESAN LATIHAN RAWAK DAN BERJADUAL KE ATAS KEMAHIRAN ASAS TENIS DI KALANGAN PELAJAR UNIVERSITI

ABSTRAK

Tujuan kajian ini adalah untuk mengkaji kesan dua latihan yang berlainan (Berjadual & Rawak) terhadap pembelajaran kemahiran asas tenis (Pukulan Depan & Pukulan Kilas) di kalangan pelajar universiti Iraq. Seramai 90 orang pelajar mengambil bahagian dalam kajian ini yang dijalankan dengan menggunakan reka bentuk penyelidikan kuasi-eksperimen, di mana ujian kemahiran asas tenis diberikan kepada pelajar sebelum dan selepas proses latihan. Para pelajar tersebut dibahagikan kepada tiga kumpulan, dengan setiap kumpulan terdiri daripada 30 orang pelajar. Bagi kumpulan-kumpulan eksperimen itu, latihan berjadual diberikan kepada kumpulan pertama, latihan rawak diberikan kepada kumpulan kedua, manakala kumpulan terkawal mengikut latihan tradisional. Selepas melalui latihan selama 12 minggu, hasil kajian menunjukkan bahawa kumpulan yang mengikuti latihan berjadual dan rawak mendapat skor yang lebih tinggi daripada kumpulan yang mengikuti latihan tradisional untuk mempelajari kemahiran asas tenis. Kesimpulannya, hasil kajian semasa menunjukkan bahawa latihan berjadual dan rawak adalah lebih berkesan untuk mempelajari pukulan depan dan pukulan belakang dalam permainan tenis. Kajian ini menyokong keberkesanan latihan berjadual dan rawak untuk pelajar universiti di Iraq . Kajian ini mempunyai implikasi yang sangat penting kerana ia menunjukkan bukti yang kukuh mengenai fakta bahawa latihan berjadual dapat mempengaruhi tahap pendidikan pelajar di peringkat universiti secara signifikan dan positif.

ACKNOLEDGEMENTS

I would like to thank the many people who have contributed their invaluable assistance, guidance and encouragement in accompanying this study. I would like to convey my sincere gratitude.

I would like to express my heartfelt and appreciation to my supervisors DR. SYED KAMARUZAMAN SYED ALI & DR. HUTKEMRI for all their help, encouragement and patient in guiding me through to complete this study.

My appreciation and thanks goes to the head of sport department and the tennis lecturer at University of Baghdad who were involved in this study for their cooperation and help in making this study a reality.

Finally I would like to thank my fiancé the love of my life, my family and my friends for supporting me throughout the period of writing this research.

TABLE OF CONTENT

CHAPTER 1 INTRODUCTION

CHAPTER 2 LITERATURE REVIEW

CHAPTER 3 METHODOLOGY

CHAPTER 4 RESULTS

CHAPTER 5 DISCUSSION AND CONCLUSION

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDEXES

CHAPTER 1 INTRODUCTION

1.1   Introduction

Specialists and researchers in the field of education are in a continues efforts to improve and update the methods and styles of learning, organizing these methods and schedule them according to the styles of teaching physical education to achieve the best style of learning the physical skills that is as close as possible to the sport circumstances.

Tennis alongside other racket games is one of the important sports in national levels in Iraq. It has a great impact in improving agility, strength, speed and stamina because of its intense style of playing. It's considered as a fast complex sport which lead to good mental development in sense of reaction time and reflexes, not to mention the health benefits. Unfortunately, this sport among many other sports is neglected during the phase of early education in schools and universities and the presented curriculums doesn't reflects the best standards to improve the sport.

Learning basic skills in any type of sport is the key to improve and advance in that sport under one condition which is that learning should be based on scientific bases that will leads to a fast learning and will cost less time and effort. Practice is what any training module is based upon. Therefore, the level of learning and improving is being built upon. Considering the number of styles of practice and the variety of these styles, specialists in the field of physical education had different opinions about how to choose the right style considering that each style has its own positive and negative aspects and its special objectivity. Therefore, biological age, training age, the type of the skill all must be considered to insure choosing the correct style of practice.

1

Many studies showed that the most common styles that used in designing training programs and curriculums are the blocked and random practice Mahjub (2013); Hebert (2012); Schmidt and Lee, (2008). The study that been conducted between Shea and Morgan (1979) considered one of the first ever original studies that compared the effectiveness of scheduling learning program in a different styles, and the results of that study showed that the blocked style of practice (low interference) has a fast impact on learning the skill on the other hand, the random practice (high interference) has a positive impact on retaining the skill after a longer period despite the low level of performing the skill. This is considered as a prove to Battig (1966) theory, it should be used when there are more than one skill should be learned and practiced until the skill can be mastered and saved in the long term memory so that the skill can be retained easier and faster during the competition time.

If the teacher/trainer teaches his students two different skills by making them perform the first skill for a 100 repetitions, then moves to the second skill and perform it for a 100 repetitions as well, this method is considered a blocked practice method (low contextual interference). On the other hand, if the method of interference was to teach the skills randomly by transferring from one skill to the other without repeating the same skill it will be considered as a random practice method (high contextual interference) in which the skill should not be repeated more than one repetition before transferring to the next skill. In random practice method the player's memory cannot anticipate which skill is coming next, which is more similar to the competition circumstances.

Many recent studies discussed the different types of exercises and learning methods to explore the effectiveness of these methods and how improvements can occur in physical and mental skills in the education field. A number of these studies

focused on the sport of tennis. Researchers have used practice scheduling more specifically in tennis because the sport of tennis includes a verity of physical skills. A three or more compound skills can cause a positive as well as a negative interference (Ismail & Tahseen, 2013).

However, there are many more aspects yet to be considered. More researches needs to be done in this specific field. More coaching workshops. Increase in the tennis facilities. More media exposure and most importantly more tennis academies.

This research proposes to help and educate coaches to understand what a compound skill is, how traditional types of practice are not effective enough and how practice scheduling can have a major effect on learning and retaining any types of skills and improve them eventually.

1.2   Statement of the Problem

Tennis is one of the sports that rarely practiced in schools and Universities in Iraq and its almost only limited in the collages of physical education. Due to lack of tennis courts and the low number of tennis coaches/teachers in Iraq (Abbas, 2013).

As many researches were conducted in this field, there are not enough realistic improvement or high effect on universities tennis players. According to the universities of Iraq sport committee, there are less than twenty tennis players to represent their universities tennis teams for the Iraqi universities annual sport event (UISC, 2017). Eighteen universities have failed to introduce at least two or more tennis players in the year 2016. This sport also that doesn't have enough of support to be involved in the Iraqi's schools program which is the foundation of any sport worldwide (Halil, 2015).

Tennis is one of the sports that are classified as an open-skill sports by researchers in the motor learning field. A type of sport where the players should always adapt their movements to a consistently changing situation on the court.

The movement of the players and their stroke execution must be continually adapted to the situation at hand. According to Mohammed (2013), "compound skills are hard to be learned by traditional academic styles and even harder to be retained".

According to Ahmed and Abis (2010) tennis especially has many complex skills and each of those skills derives a secondary skill that takes years to master regardless the skill level among beginners. Repetition is the essence of achieving the targeted skill throughout the process of learning, as Mahjoob (2013) points out that "practicing any particular skill within kinetic duty leads to improve the experience and evolve the mental and physical ability and creating a storage of information that can be used in the future". One of the main factors that affect learning is choosing the correct style of practice that helps improving the motor program which is set for any type of skills. On the other hand, Najmuldin and Hussien (2015) suggests that "there is no single style of practice can fully improve the students/players skills in all aspects". A good teacher/coach should always be capable of producing and applying a new and effective style that is suitable for the selected skill or a set of skills to make the process of learning positive".

Therefore, the style of practice must be determined according to the type of the skill whether it is an open or closed skill, the age of the player, their skill level, the tools and the instruments that available, the teacher's experience in that specific field.

Muhammed (2013) points that "only few teachers/coaches concentrate on the style of practice that is suitable for the type of any skill". Not knowing the style of practice that should be applied for any particular skill can cause a slow improvement

of that skill especially in an open skilled sport as tennis which has a wide variety of basic skills that must be mastered in order to achieve good playing level.

Another issue that is why the effect of contextual interference cannot be found more frequently in applied research settings, is that more complex motor skills are less likely to be benefited from the blocked practice scheduling because of the fact that the blocked practice increases the cognitive demand (Albaret & Thon, 2018).

The complexity of any skill is generally caused by the the choices of the stimulus response or it might be caused by the effort increase which is used by performing the skill. Most of the motor skill tasks that are used in verity of applied research should be considered as a complex tasks since they usually uses the movement of the whole body which requires the coordination of multiple limbs such as the serve in tennis, the bat swing in baseball or even the swing in golf. Most researchers have suggested that the subjects in the block practice condition engages in the processing of shallow cognitive (Shea & Morgan, 1979).

Hassan (2017) mentioned the conventional (traditional) types of practices are poorly designed due to the fact the curriculum is outdated and didn't cope with the development in sports in general. Traditional practice mainly lacks of time management in terms of the theoretical and the practical aspect (Muhammed, 2013).

The traditional practice methods are usually having the tendency of being lecturer-centered including the discussions and lectures while the element of solving the problem is presented or discussed with the teacher, the material of teaching, and the assessment of the students are mainly determined by the teacher using outdated methods of test and measurement.

For the reasons mentioned above and for the pursue of solving the problem the researcher attempt to apply two different practice programs in university of Baghdad

collage of physical education and sport sciences. first program will be random practice and the second program will be blocked practice on the basic skills in tennis to determine whether those types of practice can improve learning basic skills in tennis and to know which style of practice is better and more effective regarding learning basic skills of tennis than the other and to apply the best style if it was more effective than the traditional style of practice that it used in the school's curriculum.

1.3   Research Objectives

The objective of this study is to apply two different types of practice, compare them to each other to know which type is more effective regarding learning tennis basic skills and to compare both of those types to the traditional practice that used in the Iraqi universities curriculum.

The Main Objectives:

1. To examine the effect of blocked practice on tennis forehand basic skill.

2. To examine the effect of random practice on tennis forehand basic skill.

3. To examine the effect of difference between blocked practice, random practice and traditional practice on tennis forehand basic skill.

4. To examine the effect of blocked practice on tennis backhand basic skill.

5. To examine the effect of random practice on tennis backhand basic skill.

6. To examine the effect of difference between blocked practices, random practice and traditional practice on tennis backhand basic skill.

1.4   Research Questions

The main questions that this research aims to answer that whether there are any significant differences between the practice styles that implied which are the random and blocked, compare them to the traditional style that have been used in the

curriculum in terms of learning basic skills in tennis and then compare these styles to each other and find the most effective style in same terms.

The main points to be answered are the following:

1. Is there a statistical significant effect of blocked practice on tennis forehand basic skill?

2. Is there a statistical significant effect of random practice on tennis forehand basic skill?

3. Is there a statistical significant difference between blocked practice, random practice and traditional practice on tennis forehand basic skill?

4. Is there a statistical significant effect of blocked practice on tennis backhand basic skill?

5. Is there a statistical significant effect of random practice on tennis backhand basic skill?

6. Is there a statistical significant difference between blocked practice, random practice and traditional practice on tennis backhand basic skill?

1.5   Research Hypotheses:

The researcher suggests that there are differences between the two style used in teaching (blocked & random) and the traditional style that have been already used for the benefit of the styles implied according to the theory in learning basic skills in tennis.

1- There is no significant effect of blocked practice on tennis forehand basic skill.

2- There is no significant effect of random practice on tennis forehand basic skill.

3- There is no significant difference between blocked practice, random practice traditional practice on tennis forehand basic skill.

4- There is no significant effect of blocked practice on tennis backhand basic skill.

5- There is no significant effect of random practice on tennis backhand basic skill.

6- There is no significant difference between blocked practice, random practice and traditional practice on tennis backhand basic skill.

1.6   Significance of the Study

The study's scientific approach is to enhance the basic skills in tennis for Iraqi's physical education collages is different from other studies because it's purpose is not only to measure the effects of two different styles of practices, it's purpose is to measure whether learning has taken place and which style of practice can be more effective so it can be used in the collages curriculum to enhance the quality of the sport. Tennis is a perfect example of a high eye-body coordination skills, improving this physical ability will help the students improving their skills in other subject and sports.

This study provides an easy and organized program that helps with sessions planning depending on the type of skill that accelerate the process of learning. Unlike many other related studies that studied learning tennis using (blocked and random practice), or by using other types of practice, the current study is studying the effect of these styles in two major tennis skills which are (Forehand, Backhand) to identify the most effective style for all the mentioned skills to set once and for all the most effective ones.

The main significant of this study is to solve the long term problem of the inefficient teaching approach for the sport of tennis in general and for the university students level in specific. A different approach is taking to solve the problem by implying a more accurate practice method that is more compatible with the targeted skills that are complex and hard to achieve. A fully designed program is introduced and formed in a blocked and random style that is less time and effort consuming and

8

has a higher standard in terms of the requirements of the selected skills and how to make learning these skills easier and more fun.

1.7   Limitation of the Study

The time requirements as the class duration is no longer than 90 minutes and the main division is only 25 minutes which considered a short period for any player to have enough practice for each stroke especially for the group who are learning in the random practice style. It will not be easy to gather at least 3 more experts to evaluate the players test scores during the tests are conducted also it will not be only one test if we consider the study methodology requires 4 tests and the time between the first two tests and the second two test shouldn't be less than 12 weeks.

Furthermore, the findings of this investigation cannot be generalized to a further age groups as the random practice approach is more complicated and hard to conduct especially for beginners between 6 and 12 years of age.

Another issue regarding the subjects in this study as the student of university of Baghdad classes suppurates males and females especially in practical classes such as tennis. Therefore, the study subjects are limited to male only as male students in the collage of physical education is higher than the number of female students.

One more obstacle limits the findings of this study that the equipment used in the university are outdated. The racquets are hardly restringed which can lessen the power of any strokes. Most of the tennis balls lost its air pressure which would make it slower and the bounce is less than usual. It's very important for the researcher to update the equipment or replace the majority of them.

1.8 Definition of the Terms

1.8.1 Blocked Practice

Is the practice where all the trials should be performed on one skill only in a continuous way before changing to another skill and it's known as (Low Contextual Interference) (Schmidt & Lee, 2008). The type of practice where the individual learns the skill in a sequent way to master the skill, then only can move to the other skill (Abo Zaid, 2011).

In this study blocked practice is the practice where the student/player are required to learn one skill at a time by repeating it over and over till reaching the automatic level of performing that particular skill before moving to learn another skill.

1.8.2 Random Practice

Is the practice where the tasks are randomly executed by the learner while performing a verity of skills and it's known as (high contextual interference) (Schmidt & Lee, 2008). It's the practice where the tasks are executed randomly, executing random skills in a blended way (Mahjub, 2013).

In this study random practice is the practice where the student/player will be practicing all the skills in that particular game without emphasizing on one of the skills only, but the learning will be gradually higher in all skills together.

1.8.3 Contextual Interference

Contextual interference effect (CIE) is defined as "Function interference in learning responsible for memory improvement" (Barreiros, Figueiredo & Godinho, 2007). Contextual interference effect is the "effect on learning of the degree of functional interference found in practice situation when several tasks must be learned and are practiced together." (Magill, Richard, Hall & Kellie, 1990).

In this study, contextual interference is the context in which the player/student exposed to a certain type of practice such as random & blocked practice.

1.8.4 Practice Scheduling

Mahjoob (2013) defined practice scheduling as "Learning and mastering physical skills throughout specialized educational sessions has a specific order during the day, week and the season, includes continues concentration on each session by conduction and repeating the skills and increasing the number of repetitions as moving forward in the program".

In this study, practice scheduling is the specific sequence in which player/student practices the skill or the set of skills depends on a predetermined schedules and the time required to masters this skill or number of skills in any sport.

1.8.5 Groundstrokes

Tennis groundstrokes (forehand and backhand) are the fundamental shots in tennis. The forehand groundstroke and the backhand groundstroke are the two types of shots that are used in baseline rallies. Groundstrokes in tennis are mainly used in baseline rallies. However, these types of strokes can also be used in any part of the court depending on the situation.

The tennis groundstrokes (forehand and backhand) are the two shots that made by the tennis players after the ball bounces on the ground. The backhand groundstroke comes in two different techniques, the two handed backhand and the single handed backhand. In this study Ground strokes is the stroke where the player contacts the ball with the racket right after the ball bounces off the ground, in tennis terminology a ground stroke is any stroke besides serve or volley.

1.8.6   Tennis Forehand Basic Skill

The forehand stroke in racket games such as tennis, badminton, squash and table tennis is a stroke that is mainly made by the swinging of the racket across the body of the player while the hand rotating and the palm facing forward toward the net direction (opponent court). In the sport of tennis, the term of groundstroke refers to any stroke in which the ball requires to bounce first before the player could strike it. In opposite with the backhand stroke, which is the other type of ground strokes. For the players who are right-handed, the forehand stroke starts when the ball bounces at the right side of the player's body (for right-handed players) while the body continue its rotation across toward the left side of the body while the racket contacts the ball at the end of the full movement before the follow-through. Forehand considered the essential shot to master.

Armatures and more advanced players usually have better forehand ground-stroke than any other shots and use it as their main weapon. In this study forehand stroke is the stroke where the player contacts the ball after bouncing off the ground toward the player's right side if the player was a right-handed and vice versa, the rotation of the hand should be from the side inward the player's body (natural hand movement).

1.8.7   Tennis Backhand Basic Skill.

The backhand ground-stroke is the tennis stroke in which the player accelerates the racket and swing it around his body using the back of his hand while it should be facing the direction of the net (the opponent side). Same as the forehand stroke, the term ground-stroke refers to any stroke in which the ball has to bounce first before it should be struck by the player in contrast with the forehand ground-stroke. The term backhand is used in other racket sports such as table tennis, squash

and badminton and it has a similar motion sequence. The same motion is found in other types of sports such as the disk throwing. The backhand ground-stroke is performed while the player is approaching the net or while the player is staying on the baseline. Same as the forehand, the ball requires to bounce first on the left side of the body (for right-handed players) while the racket is moving from the left side of the body to the right side across as the contact is being made half way through the swing while the rackets ends up above the right shoulder. Unlike forehand ground-stroke, there are two types of backhands which are the single-handed backhand and the double-handed backhand depends on the player's preference.

Cash (2014) In this study backhand stroke is the stroke where the player meets the ball after the ball bounces off the ground toward his left side if the player was right-handed and vice versa. The movement of the arm will not be natural as the arm rotates away from the body to the outside.

1.8.8   Traditional Practices

Traditional practice is the program that determined by physical education lecturers to improve learning in any skill that is usually implied in the university or school curriculum (Abbas, 2013). In this study as it's related to tennis basic skills.

The traditional education is the education that defined as a lecturer-centred instruction delivery to a class of students who are considered as the receivers of information. Traditional practice stresses a very simplified basic education practices and expects mastery of academic learning in the core subject of reading, math, physical education, writing, social studies and science.

1.8.9 Basic Skills

A basic skill is the fundamental motor ability for any sport whether it is a simple skill or more of a complex one (Ali & Husney, 2010).

In this study, a basic skill is the simplest way to perform on of the four   major skills in tennis which are forehand and backhand.

CHAPTER 2 LITERATURE REVIEW

2.1   Introduction

In this chapter the researcher will discuss in details the concept of practice and what is practice scheduling (contextual interference) which are blocked, random and traditional practice. The researcher will get into explaining the theoretical framework and the theories that are related to the study. Later, the researcher will be explaining the conceptual framework of this study and a brief explanation of the tennis basic skills that are targeted in this study. The researcher will introduce similar and related studies for the purpose of comparing them to this study to show the differences in the methodology and results. At the end of the chapter, the researcher will be presenting the conclusion which will discuss the theory selection.

The concept of learning is wide and comprehensive and a basic principle of human's life. Throughout learning, the individual can interact with others, and to conduct a positive and effective role that supports his existence in the community.

Gaining these information in a serial way is the essence of learning to be analysed and saved in memory to be ready to explain any situation that falls under the borders and the directions of this information. On the other hand, many researchers have their own point of view regarding what might affect motor learning.

Mosston (1981) suggested that "the foundation of better learning is to increase the quality and the quantity of the practice".

Motor learning is one of the general educational scientific brunches that distinguish human beings since born until death, therefore, scientists in the major of psychology and motor learning have many definitions for motor learning. Othman (1987) defined motor learning as "the process of acquisition a behaviour that can be

evaluated and measured through measuring motor level. Khaiun (2010) defines motor learning as "A repetition to a specific movement that leads to a change in the motor behaviour". He also sees that learning is the result of repetition and training not as a result of maturity or motivations.

There are however many changes in the motor behaviour appears as a result of the individual maturity, therefore we cannot put these changes together inside the circle of motor learning. Motor learning is the process that enables the learner to create new motor abilities or replace old abilities throughout practicing and experimenting (Talib & Luis, 2010). Mahjoob (2013) defined motor learning as "a series of actions that related to practice and experience that leads to relevantly steady changes in the individual's ability in physical skill".

However, Othman (1987) quoted from Puni (1961) "motor learning is the process of acquisition a behaviour that can be measured through measuring the physical level".

In a summery, motor learning requires practicing and exercising along with knowing and understanding the stages of movement's skill performance. Therefore, we can evaluate motor learning through performance's logical observation. The practice will leave a trace in the performance as a result of correcting and other factors that leads to a change in the performance of improving it.

2.2   The Concept of Practice

Researchers and specialists has different opinions regarding dividing the practice, evaluate it and the factors that affect it. "practice is an extensive concept includes different experiences in a different locations and a different timing, circumstances and status, and using scientific based methods and a variety of styles of practice or practice scheduling in the sciences of physical education led to improve the physical

level and reach high achievement in sports" (Al-Rubaie, 2011). Shaker (2005) confirmed that there are major differences in the level of difficulties and complicity in some motor skills that requires working and organizing and directing motor learning.

An accurate planning must be followed in using and organizing, scheduling and the methods of achieving it "its connected to its effect, not much time should be included because practice is achieving a certain duty in a frequent way in order to learn a new skill perfectly". (Lazzam, 2012). The basic principles of practice by Mahjoob (2013) divided into:

The Quantity of Practice

Is the main procedure to learn and improve motor skills for any activity throughout the number of trials that is based on a scientific approach in order to reach with the learner the highest possible level of achieving any skill. It is only specialized in the intensity of practice during a determined time. The intensity of practice could be increased by increasing time of practice, distance, weight, number of trials and reducing the rest time.

The Quality of Practice

It's the technical method in with the practice will be executed and it depends on the motivation and repetition and staying away from mistakes and having awareness for the circumstances. The main goal of the quality of the practice is the observable enhancement that occur gradually on the student/player technique. The quality of practice can be delivered focusing on the player's weak points, or the player's strength point. It is also related to the game plan, studying the opponent. Apply different practice methods and improve the player's overall prospective of the sport.

Factors that Effects Practice

1- Instructions.

Which are the visual or vocal teachings conducted by the teacher/coach during the session or during the whole training/teaching season in specific or the program in general, including managing, explaining, goal setting and the overall leading for the program. Instructions is bind by the philosophical aspect of coaching. Each instructor or a coach has his own different method of implying instructions to the player depending on the player's age, connection between the player and the coach and the type of sport itself.

2- Showing and Model.

Showing is the direct order that the coach/teacher by conducting the skill, while the model is the construction done by professional or a high skilled individual (preferable one of the class's subjects) to execute the skill in a highest and clearest possible way. It would make it much easier for the other subject to have a clearer idea on how to conduct the proposed tasks (Mahjoob, 2013). The visual input considered very important especially for low skilled players that have not been exposed to the sport before or the student who has less internist in participating in that specific class.

3- Encouraging and Motivation.

Motivating the player/student by being pushed mentally to execute the skill in highest possible way and trying to push to the limit to achieve the goal in less time. The motivation is considered as an important factor that affect the student/player directly. It can be subdivided into internal motivation and external motivation. Internal motivation is where the student sets his own goal and try to achieve the heights possible result by motivating himself whether during practice or during actual match.

While external motivation is where the students is being motivated by his own coach, his supporting crowd or even his family.

4- Feedback.

Feedback is very important during the process of learning as it provides corrections to the conducted skill which helps the individual to eventually store the information in the long term memory by giving negative signs to incorrect behaviour which helps the brain to eliminate negative movements and only stores the correct one's. Feedback is not always positive as it could be negatively influence the students especially with more physically demanded tasks.

Objective of Practice

Expending the Elements of Sensory and Motor Perception to the Learner.

As the player enhance motor skills perception and understanding of movement, it will be easier in the future to learn more skills in a faster time as the general perceptions is more expanded, the player's approach for new learned skill will have a better prospective.

Connects all the Parts to Master the Skill.

Most complicated skills will be divided into separate parts as it makes each part much easier to be explained by the coach/teacher and understood by the learner, then all the part will be connected to make it one simple fluent movement which is the most successful method to enhance motor abilities for complicated skills especially when the learner has less understanding about motor learning and its concepts.

Improving Physical Abilities.

One of the main goals of the practice is improving physical abilities such as strength, speed, stamina, agility and flexibility as it considered to be the basic foundation for any learned skill. Unlike many other skills in different fields, Physical abilities are

the most important once in the field of physical education. It physically demanding regardless their level of complexity. There are many aspects that could be effected in terms of speed, agility, strength and stamina to help the player to reach a higher level not just in the desired sports, but in many other different sports and aspects of life.

Improving Willingness and Patience.

Willingness of the learner will be increased every step of the way as the learner starts to observe his gradual improvement and to have a better understanding about sports. Also, learner will develop patience as it plays the biggest part in the process of learning and to understand the bigger the goal the higher the patience should be.

Improving Health

Practicing sports offers many health benefits, this includes improving lungs and heart function. Practice also reduces other medical conditions such as high blood pressure, reduces bone density as well as osteoporosis. Practicing (especially in the field of sports), improves cognitive and motor skills besides weight loss and a better quality life.

Confidence building

Practicing sports leads to a better physical health that leads to impacting mental health positively. Exercising frequently alongside with a good eating habits usually leads to an improvement in the individual perception of her/his body which eventually leads to a higher self-esteem. Sports practicing enables the individual to set goals and targets which leads to having the sense of achievement by reaching those goals. Furthermore, frequent practicing to any specific sport will give more time to the individual to decrease the number of mistakes due to the high number of trials that leads to a more accurate and flawless skills.

2.3 Practice Scheduling.

A teacher or a trainer is always trying to teach more than one basic skill within a limited period of time, however, the challenge here is how to set the skill practice, for how long and how much is the required time for each regarding the level of difficulties (Khaioon, 2010). One of the most important reason for implying the styles of practice, is to increase the chances of learning the required skill.

Therefore, any teacher is in a continuous effort to find best style that is suitable according to the available variables. Schmidt and Wrisberg (2008) mentioned "It should be always considered the main variables throughout the stages of learning the targeted skill affected by many independent variables in a different patterns and those are (i) The nature of instructions, (ii) The patterns of feedback, (iii) The type of performance in the trial for different levels (iv) Practice scheduling and organizing". "Scheduling and agenizing the practice is a widely used method in the recent period" (Schmidt & Wrisberg, 2008).

There are many different of practice styles that are used by teachers- coaches, and choosing one style over the other is connected to the type of skill, how difficult is the skill, the required time to learn it, the age of the player. (Mahjoob, 2013). And those styles are (i) Fixed and variable styles, (ii) Massed and distributed, (iii) Whole and part and (iv) Blocked and random.

2.4 Traditional Practice

Traditional type of practice which is also known as back to basics type of practice or conventional education identify as a long-established method that society used traditionally in different educational establishments such as universities and schools.

It is the type of educational method that used an approach that is specialized in progressive education practice, a more traditional adaption which focuses more on

21

certain student's needs and self-control. In the view of the reformers, traditional practice is more of a teacher-centered method that has more focus on rote learning and the abandons of memorization in favor of student-centered approach and the task-based approach to learning.

According to Hassan (2018) in most cases, lecturers generally tends to avoid more progressive approaches in their methods of teaching due to the complexity of planning and the conducting of these methods in order to avoid more miscommunication in executing the given tasks by the students.

To achieve progressive learning experience by avoiding traditional education, is introducing modern approach (which is the approach that develops curriculum structures in different fields of education).

2.5   Blocked and Random Practice

In the field of physical education and sports sciences there was a large number of studies focused on the concept of practice scheduling due to its high effectiveness in learning sports basic skills, especially in the sports with a more complex skill where the environment is always changing and requires a constant adjustment.

The first method of scheduling the practice is called the blocked practice also known as (low contextual interference) (Halil, 2007).

A low interference in the context is where the basic skills practicing should be in order and must not interfere with other skills until the student/player masters the first skill then only the student can advance for the next skill. Example of that in football the player will first learn only the shooting skills without interfering with the other skill until the player reaches a certain level then only start practicing the passing skill then the dribbling hence the word blocked.

On the other hand, a high interference in the context requires the player to practice all the given skills in every practice session and not to focus on repeating the same skill more than 1-2 times before moving to practice the next skill. Using the same example ahead the football player requires to practice shooting, passing and dribbling all at once and not to repeat practicing one skill more than the others. (Shea & Morgan, 1979).

The effect of blocked and random practice (practice scheduling) was first studied by (Battig, 1966). To show the effect of both practice methods on learning basic skills and he was the first to introduce the term (contextual interference) (Battig, 1979). He studied how contextual interference effect (blocked & random) should be distributed and how it can enhance or reduce learning new skills.
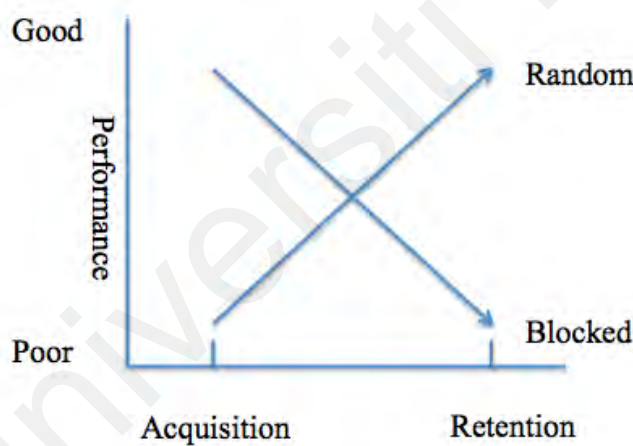
Figure 2.1. A hypothetical model of the paradoxical effect predicted in contextual interference theory (Battig, 1979)

2.6   Application of Blocked and Random Practice in Physical Education Studies.

Blocked and random practice falls under the practice scheduling which has to organize an exercise or a set of exercises in a specific order. The scheduling of

exercises can differ from one sport to the other or in the same sport between different skills.

According to Al-Rubaie (2011) blocked practice is more beneficial with relatively easier skills such as bouncing in basketball, blocking in volleyball. While random practice is more beneficial with more complex skills such as serving in volleyball, forehand and backhand groundstrokes in tennis. Blocked practice is where the subjects required to conduct the same skill over and over to reach a higher level before in the same skill before moving to the next one. This will help the subject to reduce the interaction between the skills which might eventually cause more confusion. Random practice on the other hand has a higher interference level. It's more beneficial with more complex skills that requires continent change in between the skills with a relatively shorter period of times. In random practice the subjects are required to constantly performing different skills and not to conduct one skill more than one or two times before moving to the other skill. This approach will make the subjects more adaptable to the changes in the tasks required as they are more able to connect the parts regardless the changes and it more beneficial in the retention phase.

2.7   Theoretical Framework

The researcher will discuss the influence of scheduling and organizing the practice and the effect of that scheduling on learning the basic skills, how the scheduling should be done and the main factors that will affect the learning process.

There are different approaches and explanations that tried to explain the effect of contextual interference and the order of scheduling different type of practices to reach a better learning such as the elaboration hypothesis, the action-plan reconstruction hypothesis, the retroactive inhibition explanation and Schmidt schema theory by (Schmidt, 1975, 1988).

2.7.1   Schmidt's Schema Theory

The schema theory is connected to the contextual interference theory, it does explain the influence of practice scheduling and how it can enhance learning and retaining basic skills in sports and other fields. The schema theory is based upon two different elements, the first element is generalized motor program and the second element is the rule parameterization. The first one is not specifically focuses on one movement but a set of movements such as a compound skill while the second one can be adapted to specific nature of any task.

There are three different elements in which the schema theory is based upon which are specific to learning new motor skills. First, the general motor program controls the prediction of the movement for example swinging the bat in golf. Specifically, a single general motor program controls any movement that falls under specific class because both movements are sharing a specific invariant features like the sequence of the movements or the time required to conduct it.

Second, the schema theory introduces a characteristic for the scaling of the general motor program, this will allow the students to perform a certain movement with that specific class such as long swing and short swing in golf. Example of that in tennis if the forehand stroke has to be conducted for a short distance the invariant feature of the general motor program that controls the forehand skill movement won't be changed. However, the parameter's force will be decreased.

Third, because of the variation of the movement during the practice, the schema theory is strengthened and formed. Simply, how strong the schema is depending on the function of the practice variables. However, constant practice could not support the formation of the schema theory. Specifically, it allows the building of a more

effective rule of the parameterization by suggesting that the variability of practice will force the subjects to continuously parameterize the motor program in each trial.

However, same movement repetition will only reinforce that specific skills in this context, the subject cannot learn to adapt to changing conditions. The subject will learn faster while imposing blocked practice for only one skill at a time but will have a problem retaining the skill. On the other hand randomly scheduled practices will have a better retaining ratio due to the subject's ability to adapt to the different skills that imposed.
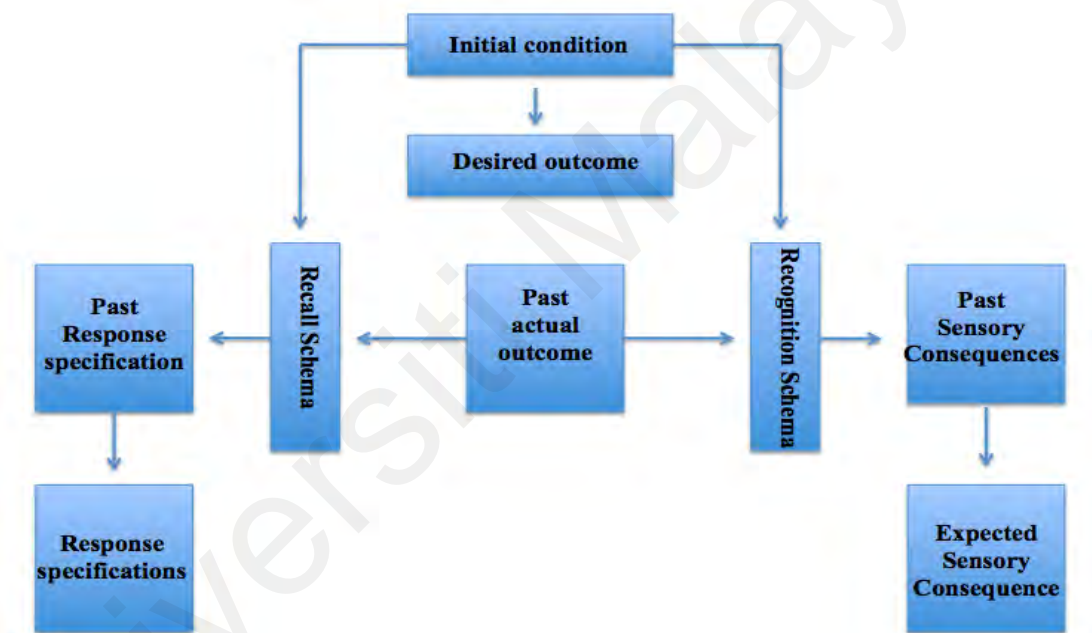
Figure 2.2. Schema theory of discrete motor learning (Schmidt, 1975)

2.7.2 The elaboration hypothesis:

According to the theory of elaboration hypotheses, the acquisition of new skills is sustainable by two kinds of processing, the first process called the intra-task and the second called inter-task. The first process is involved with the analysis of the individual's task without referring to any direct information that is related to another required task (this could be a variant of the used task) or other existent knowledge. On the other hand, the second process with is the inter-task's main aim is to highlight

the between-task analyses, whether the acquired tasks are similar or different. Regarding the contextual interference effect, it shows that the blocked practice scheduling requires the processing of intra-task only, whereas the random practice scheduling requires both processes intra-task and inter-task. The blocked practice scheduling there will be only one task only resides in the working memory at a time. This explains the requirement for the processing of intra-task. However, in random schedule, more than one task will be working in the memory at the same time. Because it is possible to identify the similarity and differences between the tasks, the processing of inter-task will allow better amnesic representation than the block scheduling that is connected to the intra-task processing.

There is a large number of studies supports the elaboration hypothesis theory. One of them was by Shea and Zimmny (1988) when in the study experiment they have recorded all the subjects' verbal responses who are following the practice scheduling under random and blocked circumstances. The results of this particular experiment showed all the subjects who were following the random practice scheduling were more able to compare between the tasks and to come up with more than one strategy which was more acceptable for learning. Furthermore, Limons and Shea (1988) have supported this claim as well, showing that the recognition was mainly depends on intra-task elaboration while the recall performance showed that it was necessary for the inter-task and for the processing of intra-task. The researchers in this experiments have administered the task of barrier knockdown to a 72 subjects. It was included with 2 levels of training which were random and blocked that was crossed with other 2 levels of recognition training which are (recognition training and no recognition training). The subjects who were in recognition training had to study 3 different diagrams regarding the tasks they that they would practice and the

subjects had to identify those diagrams among six other non-studied diagrams before acquiring practice. The subjects who were on the no recognition diagram conditions was given the no recognition training before reaching the phase of learning. Both groups subjects received an identical tests later after learning. At the end, the subjects who were given the recognition test that consist of identifying the three tasks diagram practice during learning from the other 6 diagram tasks. The result of the study showed that the subjects who used random and blocked practice conditions performed well equally on the list of recognition. However, the subjects in the blocked conditions was less efficient during recalling the movement information. In conclusion, the study showed that both random and blocked practices conditions has a different processing.

Other researcher has supported the elaboration hypotheses. In the study of Wright (1991); Wright, Li and Whitacre (1992) those researchers has conducted a different type of experiment where they found the type of processing by adding to the block practice an additional intra-task and inter-task processing. Moreover, the researchers have increased the level of the processing of the inter-task by asking the subjects after every trial too look at a certain shape that includes movement patterns for one of the other movements patterns that belongs to a different blocks and have to show the similarities between them. The intra-task is increased by asking the individuals to verbalize the movement pattern that they have just performed.

The increase of the cognitive demand during the random practice by adding extra processing, will create an overload phenomenon. The researchers also found out that the retention performance was similar to the typical random results. The results for this research showed that the group that used the blocked practice with extra inter-task was performing as good as the groups that used random practice. The

results of this study showed that the processing of inter-task is very important for skill learning. The results also showed that the effect was limited as the researcher had to add the processing of inter-task to the random group schedule which can be changed and delayed the learning. The increase of the cognitive demand during the random practice by adding extra processing, will create an overload phenomenon. The researchers also found out the retention performance was similar to the typical random results.

2.7.3   Retroactive Inhibition Explanation

The hypothesis of retroactive inhabitation focuses on the disadvantages of the blocked practice scheduling. In the study of Poto (1988) showed the blocked schedule is has many disadvantages because of what's known as the retroactive interference effect. The reason is that the performance of any retention test could be effected by the combination of proactive and retroactive interference. The task administered by Poto had the subjects to go through a consisting of a block of task A, then a block of another task which is B, and another block of task C. Later the subjects will be tested on all of the three tasks. The retroactive interference in this task will affect the performance of the first two tasks, while proactive interference will affect the performance of the second two tasks. The results for Poto's study showed that the further the subjects practices the task from the retention test the poorer their retention was. Therefore, the retroactive interference was the reason of poor retention test performance.

According to Brady (1998) in a review he wrote showed there were many experiments that was supporting the hypothesis of the retroactive inhibition. Example of that, Meeuwsen (1987) cited in Brady (1998) has showed that a group that was given blocked practice scheduling that was given a retention test after each trial block

(and thereby eliminating retroactive inhibition) showed a better results than the typical group who used blocked scheduling. The researcher concluded that the worse performance was after blocked practice scheduling as compared to random practice scheduling and the reason is might results from the retroactive inhibition. In their study, Shea and Titzer (1993) examined the effect of reminder trials on the contextual interference. The subjects had to perform three different tasks under either random or blocked scheduled practice, with either one reminder trial or no reminder trial for each of the tasks toward the end of the practice session. The researchers found that that there was no significant differences between the random and blocked group who received a reminder trial. However, the researchers found that there was a contextual interference effect between the group that used blocked practice without reminder trial and the group that used random practice. This particular observation supports the retroactive inhibition hypothesis (Sewokis, Del Rey & Simpson, 1998).
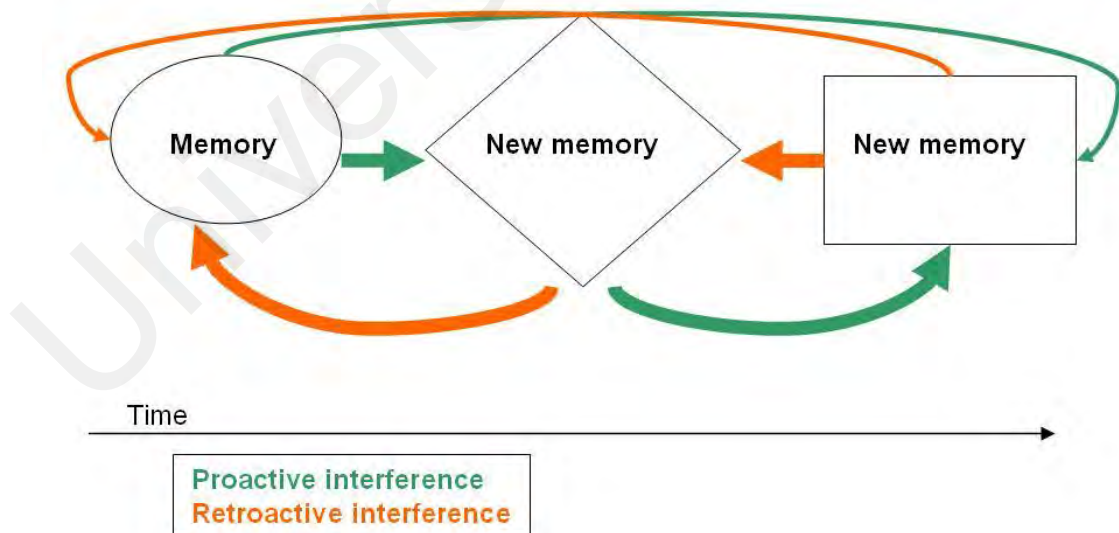
Figure 2.3. Shows the proactive and retroactive interference

2.7.4   The action-plan reconstruction hypothesis

Many researchers such as Lee and Magill (1983); Lee, Magill and Weeks (1985) have tried to account for the contextual interference effect by implying a reconstruction method that can occur in the condition of random practice. The main idea that they had was the random practice requires a processing that is more effortful during each trial because this type of information is more related to the action plan for that current trial is forgotten as a result of practicing the intervening movement. So, for each trial, the students are required to reconstruct a different action plan before conducting the next movement. On the other hand, for blocked practice, an action plan that is appropriate for the next trial is still active in the working memory for the preceding trial.

Therefore, the reconstructive activity in the blocked practice will be minimized as compared to random practice. According to the action-plan reconstruction hypotheses, reconstructing the action plan during each trial will improve the ability to generate more appropriate responses when the learner is confronted with a different transfer task (i.e., performance on this transfer task is benefitted from the student's ability to generate or reconstruct a new action plans).

According to Lee, Wishart, Cunningham, and Carnahan's (1997) their results are in favour of supporting the action plan reconstruction hypothesis. In their study, they have compared three different practice groups. The three groups were blocked practice and random practice and the group of random practice in which provided a model before each trial.

Lee (1997) have predicted that a template providing for the next trial the be preventing the forgetting and the consequence needed for an action plan to process the construction. The results found by Lee supports this view because the participants

condition in the random practice group with information that is provided by the model had a similar performance to the blocked practice group in both the retaining tests and the learning tests.

The study of Immink and Wright (1998) showed that the basic principle is underlying the approach of reconstruction which was correct. The researcher expeted that the subjects in the random practice schedule might need an extra time to finish their preparation of the upcoming movement than the group in the blocked practice schedule. In order to test that prediction, the researcher allowed the sample to choose for how long they can view the stimulus material in order for them to be able to plan the upcoming movement. However, sequences for the letters was presented and the individuals had to retype them on the computer's keyboard. The instructions of the the trial was to was to make the subjects look at the letters on the screen for as long as they needed and they see necessary to make them able to reproduce that sequence accurately and faster than before. The different combination of the 4 keys was used and the subjects practiced all of them in either random or blocked practice conditions. The subjects selected for the blocked practice scheduling have practiced all of the trials and responded to one of the sequence before practicing the other sequence. While the students who used random scheduling have practiced the sequence randomly. As the researcher predicted, the time for the study was decreased much faster and have reached a lower asymptote during the blocked practice program then during the random practice program.

Cross, Schmidt and Grafton (2007) have examined the neural substrate of the contextual interference effect by using the fMRI the functional magnetic responses to achieve this. The researchers used the task method of Immink and Wright (1998).

The learners had to acquire a set of 3-4 element sequence that are showed on a computer according to a random and blocked scheduling of practice.

The selected theory for this study by the researcher is schema theory by Schmidt's theory (1975), (1988) in comparison, constant practice (blocked) does not support schema formation. More specifically, it is suggested that practice variability forces individuals to continuously parameterize the motor program and allows the building of effective parameterization rules. On the other hand, repetition of the same movement only allows reinforcement of a specific motor program; in this context, the subject cannot learn to adapt to changing conditions. The subject will learn faster while imposing blocked practice for only one skill at a time but will have a problem retaining the skill.

On the other hand randomly scheduled practices will have a better retaining ratio due to the subject's ability to adapt to the different skills that imposed.

2.8 Conceptual Framework

The theoretical concept applied in this theory is the contextual interference effect theory (CIE). Regarding the contextual interference effect, it shows that the blocked practice scheduling requires the processing of intra-task only, whereas the random practice scheduling requires both processes intra-task and inter-task. The blocked practice scheduling there will be only one task only resides in the working memory at a time. This explains the requirement for the processing of intra-task. However, in random schedule, more than one task will be working in the memory at the same time

As shown in the figure below the independent variable is the basic skills in tennis. The practices selected for each experimental group as a treatment was designed and applied by experts in the fields of training, motor learning and tennis

coaches. All subjects in all groups will be executing identical tests for all of the tennis basic skills. Then each group will receive different type of treatment.

The first experimental group will receive blocked type of practice and the second experimental group will receive random type of practice while the controlled group will proceed with the traditional practice that already exist and being taught in the collage. The concept is to identify which is the most effective practice in learning tennis basic skills (acquisition) in the first post-test. Identical test will be executed by the same students after a period of time to identify which of the groups has the higher score mean as a retention test in other words which of the groups can retain the skills better.
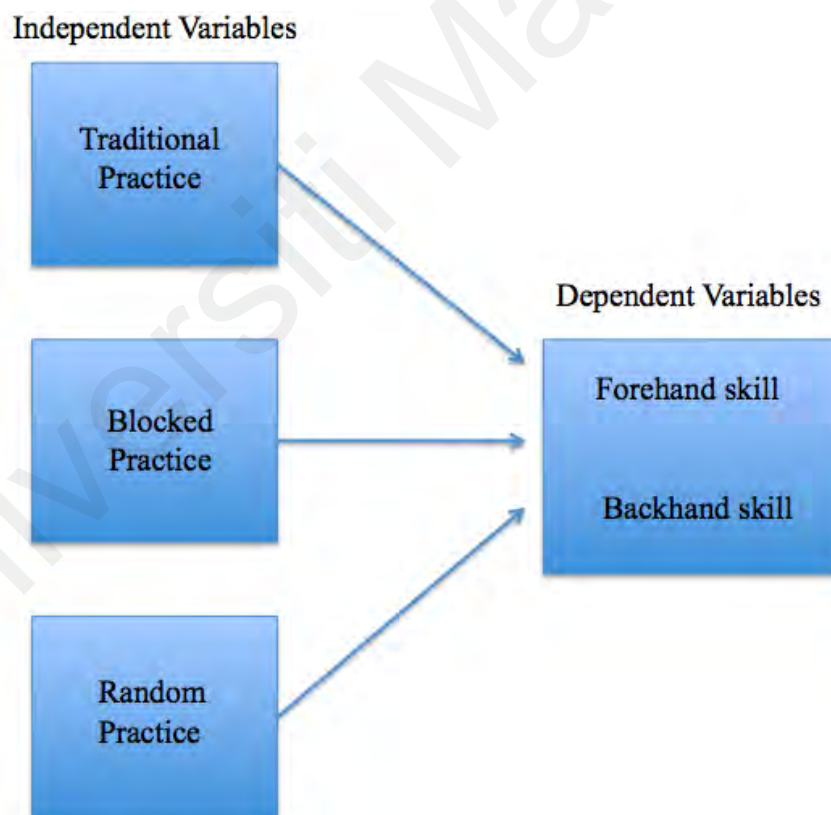
Figure 2.4. Conceptual framework

2.9   Basic Skills in Tennis

The sport of tennis is majorly consisting of four basic strokes which are (the serve, the volley, the forehand ground stroke and the backhand ground stroke. These strokes

consider the fundamental movement aspects to master the sport and have more precise contact with the ball. A tennis point starts with a serve by the server. Followed by receiving the ball by the receiver. All the other strokes followed such as the forehand, the backhand, the volley are determined by the plan or the choices made by both players (in a singles match) to get a winner shot or to force the opponent to make a mistake. The shot selecting technique is usually depending on the player's style and his physical qualities.

Every other stroke in tennis such as the smash, the lop, the half volley are derived from one or more fundamental strokes mentioned above. The smash is basically serving the ball during the rally. Meaning it's the only time the player can serve from a different positions of the court. The lop can be conducted by a forehand or a backhand with one different that is the angle of the shot should be much higher than the normal forehand shot. The half volley is very similar to the volley shot in technique with one different is that the time to hit the ball is right after the ball bounces off the ground.

2.10   The Basic Mechanics of Tennis

Every stroke in the sport of tennis is conducted by a sequence of motions also known as kinetic-chain. It starts all the way down from the player's feet, through the legs, the upper body, shoulders, arms and eventually the racket at the moment of contacting the ball. This link allows the build-up of the energy and help transferring it to the racket by transferring the power for the stroke.

In a biomechanical sense, better stroke mainly comes from a better kinetic chain which is more smooth and functional in transferring the power. However, inaccurate technique is a result of a dysfunctional movements and a bad transfer of the power which might also leads to injuries (Cash, 2014).

To understand the principles of the technical basics, below is a detailed important points of how to conduct a better ground strokes.

2.11   Tennis Groundstroke.
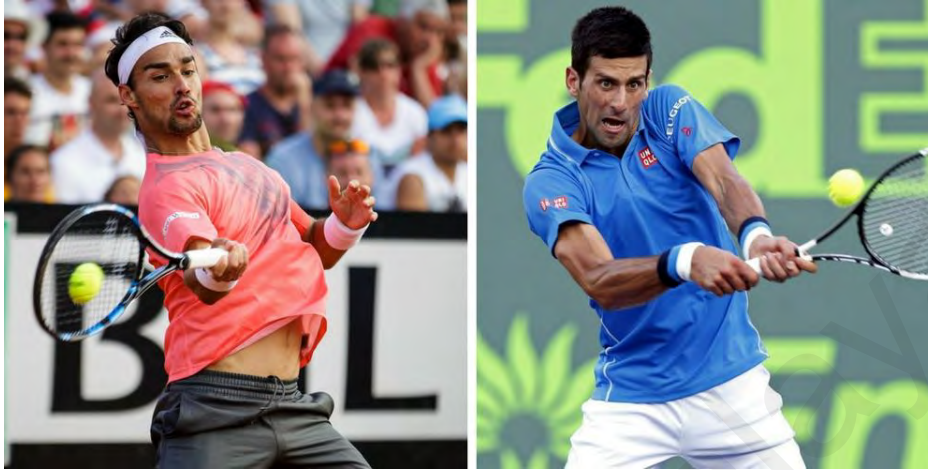
Figure 2.5 shows tennis groundstrokes (forehand and backhand skills)

(Cash, 2014)

Ground strokes in tennis are the most important stroke in the sport. It's either a forehand or a backhand depending on the ball procession relatively to the player's possession. Both strokes mainly played from the baseline during the rally or serve return at the back of the court as long as the ball bounces of the ground otherwise it's not a ground stroke such as serve, volley, smash and serve.

The forehand ground stroke in tennis considered as the main weapon for any player as the arm of the player moves naturally inward the player's body with the forearm facing the net. It allows the player to generate more power than any other stroke. However, backhand stroke conducted where the back of the player's hand facing the net moving outward the body which is less natural movement and has less power and accuracy. That's why the backhand skill considered as a more defensive skill.

Both forehand and backhand strokes like other strokes in tennis could behave differently while conducting which could generate different types of spins on the ball such as topspin, backspin and sidespin. Both strokes considered a very physical strokes as compared to serve, volley, slice, smash. They are required to have a wide based by locating both feet more than shoulder width apart. Lower core to bring the centre of gravity as low as possible to the ground to insure more balance without compromising the speed of the player and his/her ability to change direction. Feet position will allow the player to rotate the hips as fast as possible enabling rotating the shoulders and eventually transferring the power from the hand to racket then the ball which is the ultimate goal.

2.11.1 Forehand Groundstroke.

A forehand in tennis is a shot that is performed from the back of the court at the baseline where the racket should be held with the player's dominant hand. For the players who are right-handed, the forehand swing should start from the right side of their body, and continue forwards across the body as the player contacts the ball.

During the movement at the point of the palm of the player hand should be turned away from the player's body and finishes at the left side behind the player. The arm must be very relaxed in order to help with the speed of the rotation of the shoulder and elbow in order for the racket to meet the ball with an open racket face to reduce the margin of error. Once the ball is released toward the opponent court, the racket should remain relaxed and floating around the player's body toward the left side (for right handed players) above the shoulder while the elbow is aiming toward the opponent court at 45 degrees.

How to Hit a Forehand Stroke?

As mentioned before for both ground strokes, forehand ground stroke could impose a variety of different spins on the ball. For the purpose of this study the researcher will explain how a topspin forehand ground stroke is performed from the baseline.

Figure 2.6 the six main steps to conduct the forehand skills (Cash, 2014)

How to Hit a Forehand Groundstroke in 6 Steps.

1- Preparation. Preparation is very important as the player who prepares early will have more time to achieve a correct technique. It starts with a split step with the feet a small open in the legs which will give the player a more dynamic body possession to start moving toward the ball.

2. The player must rotate the upper body before taking the first step to the right side of the body followed by turning the shoulders and eventually moving the arm back.

3. As the player reaches a stable possession behind the ball, the dominant arm must fall down and continue moving forward toward the ball without any lag in movement.

4. At this phase of the movement, it's important that the player starts unwinding the body to help the arm to generate extra speed to carry toward the ball.

5. The player must continue rotating the body (uncoil) the body up and forward to the ball and at this stage the body must be facing the net.

6. The player must follow through by continuing his arm extension across the body toward the non-dominant side of the body, while the head and the body must remain facing the net.

7. The player must complete the stroke and the weight of the body should be shifted to the left leg and the racket possession should be above the left shoulder.

2.11.2 Backhand Groundstroke.

The backhand ground stroke in tennis is the second ground stroke after the forehand. Just like the forehand, the swing starts at the left side of the body (for right-handed players) and moves forward and across the body all the way to the right side. The arm must be very relaxed in order to help with the speed of the rotation of the shoulder and elbow in order for the racket to meet the ball with an open racket face to reduce the margin of error. Once the ball is released toward the opponent court, the racket should remain relaxed and floating around the player's body toward the left side (for right handed players) above the shoulder while the elbow is aiming toward the opponent court at 45 degrees.
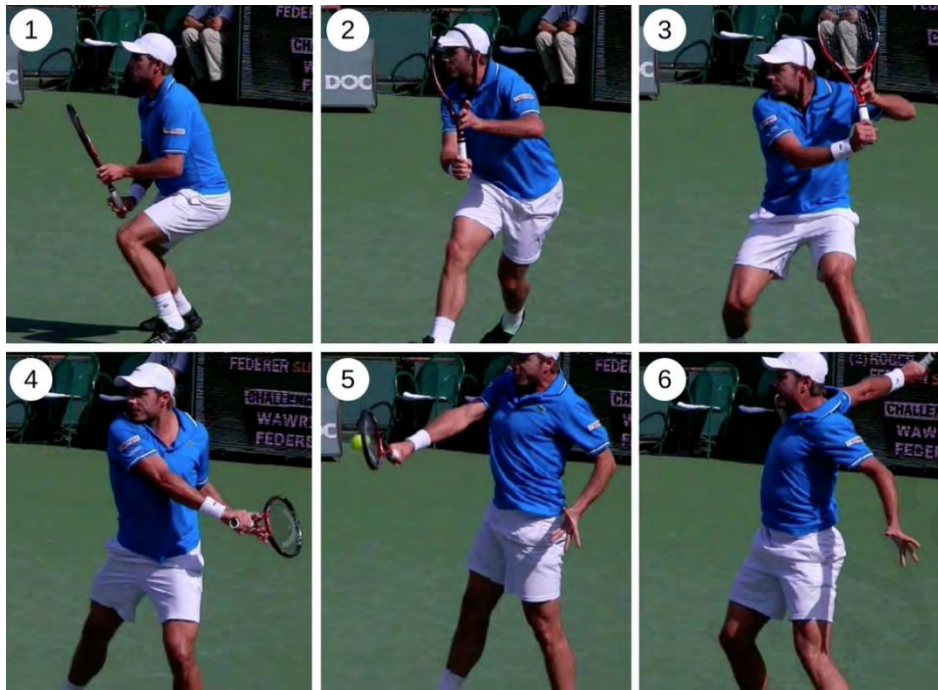
Figure 2.7 the 6 main steps to conduct a single handed backhand (Cash, 2014)

How to Hit a Backhand Groundstroke:

1- Just like the forehand ground stroke, the preparation should be the same. Starting with a light split step followed by widening the legs and twisting the upper-body to the left side of the body (for right-handed players).

2- The player must start moving sideways to the direction of the ball while he keeps rotating the upper body.

3. Once the player reaches a stable possession behind the ball, the arm should be taken above the shoulder level at the left side of the body and the right shoulder points directly toward the ball.

4. Just like in forehand the arm must be dropped below waste level as the player start rotating toward the ball.

5. As the player continue the upper body rotation allowing it to carry the arm up and forward in front of the body with as much speed as possible.

6. The player must extend the arm forward across the body and higher than the right shoulder right after contact to make sure he can generate more topspin on the ball to keep it down.

2.12   Random and Blocked Practice in Tennis Related Study

There were many other studies conducted in the past by other researchers in the field of physical education and sport sciences regarding the development of tennis basic skills. Some studies used practice scheduling such as blocked and random practice as a method improving those skills. Other studies used a different approach or different types of practice methods to improve those skills. Other studies used the blocked and random practice (practice scheduling) to improve the basic skills in other types of sports such as football, basketball, golf, squash, baseball and swimming. Below, the researcher will try to show a verity of those studies with their results, sampling technique, research design and a brief comparison between this study and all the other studies and highlight the differences among all of them.

In a study of Ismail and Tahseen (2013) "Effect of using random and blocked, constant and various practice schedule on learning some skills in tennis for beginners". The goals of the study were to measure the effect of practice scheduling (random vs. blocked, constant vs. various) on learning some skills in tennis. The study investigates the effect on motor program planning and the transfer of learning. The subjects in this study were 48 students enrolled at Sulaymamia Collage, they divided into four groups,

The first group used random practice, second group used blocked practice, third group used traditional practice and the forth group used various practice. The results revealed that there is a significant effect for all four kinds of practices. The best group in terms of learning was the random practice group. Followed by the various practice

on learning some skills in tennis. The different between this study and the current study is that this study has four different practice styles and it has less number of subjects and covered three different skills in tennis and the approach was experimental instead of quasi-experimental.

The study of Ali and Husney (2010) "The effect of practice scheduling of the exercise practice and its repetitions on learning some opened skills in tennis". In order to select the best type of scheduling for the practice and its repetitions that leads to an effective learning. The study aimed to imply few different scheduling and timing for each skill to select the most effective one. The sample of the study contained of 30 from level 3 in university of Baghdad collage of physical education who are regularly attending the tennis classes with less possible absence for the year 2011-2012.

The researcher used the experimental design for the study for the three groups and each group had different timing and repetition for the skills. Age ratio was 21.6 years and the selected tests aimed to test three of the main skills (forehand, backhand and volley). The results showed a significant difference among the three groups and the first experiment group showed the most significant improvement in the skills who did execute the practices within an hour or less.

The researcher advices to use different types of practice and enough repetitions in different timings for the tennis opened skills and give proper amount of rest for the participants using practice scheduling. The noticeable differences between both studies was the study design as the current study uses quasi-experimental design not to mention the number of sampling which are only 30 students, and the fact that this study focuses on three different skills.

The study of Ali (2012) titled "The effect of verity types of performance in random and blocked practice on the depth of backhand and forehand in tennis". This study aimed to investigate the effect of random and blocked practice on the shot speed of both backhand and forehand basic skill. The research's main problem was which was he most effective practice on both of the forehand and backhand basic skills.

The study consists of 45 male students as a subjects who were taking tennis classes at the collage of physical education. The average age for the subjects was 21.3 years of age and was divided to 3 groups. First group was traditional practice which is the controlled group, second group was blocked and the third was random.

The results showed that there was a significant effect between the pre-test and the post-test for all three groups in learning forehand and backhand strokes. The group with the random practice showed a higher increase in learning tennis basic skills than the blocked group and the controlled group.

The researcher recommends on emphasizing on the use of practice scheduling especially random practice which has a more significant effect among the other groups.

The difference between this study and the current study is that this study has an experimental approach and only 45 subjects. The tests in this study measured the speed of the skills rather than accuracy.

In a study of Qassim (2013) "The effect of using random and blocked schedule on learning tennis serve for armature". The goals of the study were to measure the effect of practice scheduling (random vs. blocked) on learning tennis serve. The study investigates the effect on motor program planning and the transfer of learning. The

subjects in this study were 40 students enrolled at Baghdad Collage, they divided into four groups,

The first group used random practice, second group used blocked practice, third group used traditional practice. The results revealed that there is a significant effect for both groups kinds of practices. The best group in terms of learning was the random practice group. Followed by the blocked practice on learning the serve skill in tennis. The different between this study and the current study is that this study has two different practice styles and it has less number of subjects and covered only one skill in tennis and the approach was experimental instead of quasi-experimental.

The study of Khalid (2017) "the effect of blocked, random and distributed practice on tennis backhand skills for club level players". The subjects who were 21 club tennis players divided into three groups. First group practiced their routine using blocked method of practice. The second group used blocked practice while the third group used distributed practice. The researcher used the experimental method fore this research. The experiment was held at the tennis courts of the club for a duration of three months (three training sessions a week). The researcher tested the player's backhand skills in the pre-test and at the end of the treatment for the post test. The results showed a higher increase for the second group who used the random practice, the distributed group and the blocked group respectively during the post-test 3 months later after the pre-test.

The main difference between Khalid's study and this study is that the researcher in this study is using the quasi-experimental approach instead of the experimental design. The population of the previous study are only 21 players who are divided into 3 groups 7 players per group. The previous study sample were all professional players while this study is using amateur university students. The previous study consists of

one skill only which is the backhand skill, while this study focuses on 2 main skills which are the forehand and the backhand. The previous study is using three different practice styles which are blocked, random and distributed style, while this study's main objective is to study the effect of blocked and random practice only.

The study of Halil (2007) the effect of different learning methods in learning and retaining forehand, backhand and serve in tennis for students, a 60 students were the subject of the study divided into three groups, and the study had an experimental design and reached to the conclusion that the methods of learning (random and blocked practice) has a positive effect on learning and retaining forehand and backhand and serve in tennis and there was improvement in the students who learned by watching the slow-motion videos and it took less time for the students to learn and retain the skills as compared to the ones who used the traditional method of learning.

The different between this study and the current study that in this study covered three different skills. The basic skills in tennis was shown in slow-motion videos to the students as a way of learning the skills and explaining them. The approach was experimental and has a lesser number of subjects and a longer period for conducting the experiment.

The study of Hameed (2016) "Practice scheduling and its effect on tennis forehand volley and backhand volley for female high school students". The main objective of this study was to measure the main differences in learning tennis volley skills using the blocked practice and the random practice for female beginners high school students in Iraq. The sample of the study was divided into 2 groups each contains 40 female students. First groups used the blocked practice in learning the skill while the second group used the random practice. The researcher used the quasi-experimental design for a period of 2 months and one training session a week. The

results showed a higher increase in the level of performing the volley skills in the first group (blocked group) while the second group (random group) showed a very minor increase in the level of the payer's volley skills.

The main differences in both studies were the type of skills that the researchers used, the period of the experiment and the age and sex of the player. Both studies used the quasi-experimental design, however this study used only male students who are university level while the other study used only female high school students who has no previous knowledge for any tennis skills. The previous study showed more increase in the skill level for the blocked group while this study showed a higher increase in the random group than the blocked group. The reason for that is the blocked style in more effective for beginners and children than the random practice due to its complexity.

The study of Abbas (2013) Effectiveness of practice scheduling random & blocked in learning ground-strokes in tennis. The importance of this study comes to understand the effect of practice scheduling on ground strokes in tennis as the traditional method wasn't as effective and the students showed a lack of good performing as well as lower grades in tastings not to mention that the majority of students was never exposed for tennis skills before practicing it in the university.

The researcher used the experimental design as it is more suitable to the nature of the study. The sample were 75 students who divided into three groups two of them were experimental. The researcher concluded after the pre and post-tests that experimental groups showed higher ratio of learning especially the first experimental group who used the blocked practice while the group who used the random practice showed a higher rate of retaining the skill. The researcher recommended using

practice scheduling as a part of the curriculum and try as much as possible to avoid the traditional style.

There are many similarities between this study and the current study as both of them uses the practice scheduling as a part of the interference, however, this study didn't used an experimental approach. The program design wasn't accurately following practice scheduling as most of the practice were more of the blocked side rather than the blocked and random side. This study has a second post-test to measure skill retaining.

A study conducted by Lutfi (2013) titled "practice scheduling and its effect on tennis strategy among advanced players". This study aims to understand how different practice scheduling methods such as forehand and backhand can affect players planning and strategical decision at a high levelled performance during competition. A population of 40 players were selected among Egyptian tennis league players. A quasi-experimental design was selected as a methodology for this study. A pre-test was conducted on all players to measure the player's ability to decision making and plans selection during league matches. The sample was divided into 2 groups. The first group was assigned for a random practice while the second was assigned for random practice. The results showed that there was a noticeable advance in both groups ability for plan selection. However, the second group's advance (blocked) was significantly higher than the first group (blocked). According to the researcher, the mental aspect of the game might be less likely to increase using random practice due to the unpredictability of the random practice and its way to impact players.

There are many differences between this study and the previous study and this study. First to start with the number of samples is significantly lesser in the previous

study than this study. Both studies used the quasi-experimental approach as a method to conduct the experiment. The previous study used advanced tennis players while this study is using collage level beginner players as a sample. The focus of the previous study was the mental aspects of the players and their plan selection, while this study is focusing on the physical aspect presented in the basic skills of tennis which are the forehand and backhand. This study showed that both groups advanced their level and the random group was significantly higher than the blocked group. The previous study showed that the blocked group have advanced more than the random group.

2.13   Random and Blocked Practice in Other Sport Related Study

The study was conducted by Rashid and Abdulqader (2012) "The impact of using the style of practice scheduling static and distributed in learning some basic offensive skills in mini basketball". This study aimed to examine the effect of practice scheduling (distributed, static and traditional practice) that used by the teacher in learning mini basketball basic skills. And comparing all the other 3 types of practices in the post test.

This study used the experimental design as it is more suitable for the nature of the problem. Number of subjects was 53 students who were selected deliberately. These students are representing two classes and were divided into two groups the first was experimental group and the second was controlled group.

The type of practice was assigned randomly and the program took seven weeks period in a rate of two sessions a week and the time for each session was 45 minutes for both of the groups.

The following was concluded by the researcher: all three types of practice scheduling distributed, static and traditional that have a positive effect on learning offensive basic skills with different levels in mini basketball.

The differences between this study and the current study is that this study has less number of subjects, different sport and only one skill to focus on. The student age ratio in this study was 10.6 years of age as the mini basketball is a part of school program.

Another study was conducted by Saadallah and Abbas (2010) with title the effect of blocked and random practice in improving shooting for football juniors a study was conducted in Dyala football club for 20 players between the age 4-7 years and it had an experimental design to match the nature of the study. After getting the results, it showed that blocked and random practice has a positive effect on the shooting skill in football. The impact of the two learning styles is very suitable for junior players rather advanced ones. Few differences were noticed between the previous study and this study is that this study used experimental approach and the subjects were only 4-7 years old and it wasn't used for tennis but used in football and also included one skill only rather a multiple skill to show the different of the impact in learning and retaining.

The study of Jamal (2014) "The effect of practice scheduling on table tennis basic skills among Iraqi international players" the objective of this study was to determine the effect of blocked and random practice on table tennis forehand and backhand slice among Iraqi national team players under 16 years of age. The researcher in this study used the experimental design and the sample of the study was all the Iraqi national team players who are under 16 years' old which is 12 players.

A pre-test was held at university of Baghdad collage of physical education indoor table tennis courts. The treatment period was 12 weeks 2 sessions a week. The first group used the random practice as a training approach while the second group used the blocked practice. The post-test results showed a significant difference between the first and the second group. The second group which used random practice have significantly improved their basic skills as compared to the first group which was the blocked group. According to the researcher "Random practice effects higher level players than blocked practice because of the random approach is more similar to the real match circumstances.

The main differences between this study and the previous study that this study uses the experimental approach in designing the research while this study is using the quasi-experimental approach. Both studies were conducted for the same period of time, however, the population of this study are 90 students whereas the previous study's population are only 12 players (6 players per group). The previous study aims to understand the differences in basic skills in tennis while this study aims to understand the main differences in tennis.

The study of Raheem (2014) that is titled "The effect of blocked and random practice on badminton basic skills for university students". The aim of this study was to measure the effect of both practice approaches which are blocked and random practice on badminton basic skills among Syrian university student. The researcher in this study used the experimental design to conduct his treatment. The population were 40 students divided into 3 groups. First group used blocked practice during the treatment. Second group used the random practice, while the third group was the controlled group that didn't receive any treatment. each group contained 14 students except for the controlled group 12 students only. The experiment was held at the

University of Tishreen at sports and recreation faculty multipurpose courts. The duration for the experiment was 4 weeks in a rate of 2 sessions a week. 3 tests were conducted which are the pre-test, post-test1for learning the skill and post-test2 for skill retention. The results showed that the first controlled group which was the blocked has a significant impact on learning the skill during the post-test1, while the second group which used the random approach showed a significant approach in the post-test2. The reason for that is the blocked practice is more effective in learning any new skill, while the random practice is more effective retaining any learned skill after a period of time.

The main differences between this study and the previous study, is that the previous study used the experimental design approach to conduct the treatment while this study is using the quasi-experimental approach to conduct the treatment. the number of subjects in this study are 60 students while the number of the subjects used in the previous study were only 40 students. This study in measuring the basic skills of tennis while the previous study is aiming to study the differences on the basic skills in badminton. This study consists of only 2 tests before and after the treatment while the previous study has three different test which are pre-test, post-test1 and post-test2.

A study was conducted by Muhaibes (2012) titled the effect of random and blocked program based to improve coordination in smash and block for junior volleyball players. The subjects were 18 junior players and used experimental design for it more suitable for the nature of the study. The results showed that the methods used in this research had a positive impact in the coordination of the two mentioned skills. The results were not steady and has a fluctuation in the final results. Finally,

the random practice showed more positive effect than the blocked practice in learning and retaining the skill.

There was similarities and differences between Muhammed's study and this study for example this study used experimental approach and it used to improve the coordination. It used in only two skills rather than covering all the basic skills furthermore, it used in volleyball and not tennis and it has less number of subject as compared to this study.

A recent study was conducted by Abu Al-Taieb (2013) The Effect of Blended Learning with Blocked and Random Practice on Skills Performance and Cognitive Achievement in Swimming among Physical Education College Students. The subjects of this study were divided into three groups The sample of the study consist of 30 male students in level 2 swimming course, which was divided into three groups; A: control group of 10 students learning with the traditional style, B: experimental group of 10 students blended learning with blocked practice, C: experimental group of 10 students blended learning with random practice.

The results of this study revealed: 1- Using the blended learning with blocked practice an effect to learn the breaststroke skills. 2- Using the blended learning with random practice group in the lifeguard skills. The researcher recommends A-Using the blocked practice to learn the sport skills with Low Contextual Interference and repeated movement as breaststroke. B-Using blocked practice to learn the sport skills with high Contextual Interference as lifeguard skills. C-Benefiting from blended learning to increase interaction and improvement of knowledge and skills among students.

There are differences between both studies can be simplified as the previous study has a new approach which is blended style, which is a combination of random

practice and blocked practice and used as a treatment for one of the experimental groups while the other 2 groups had either random or blocked practice. Also it used to improve some swimming skills rather than tennis skills and the study was conducted in Jordan.

The study of Ersa (2011) "the effect of practice scheduling on volleyball basic skills for male players" this study aimed to measure the effect of practice scheduling (blocked and random) on volleyball basic skills for university level male players at university of Mustansirya. The subjects were selected randomly 20 players among the university students. All subjects were pre-tested to measure their ability to perform the volleyball basic skills before being exposed to the treatment. The treatment lasted for 90 days and the subjects were divided into two groups 10 players each. The first groups used the blocked practice scheduling while the second group used the random practice scheduling. The results showed that the second group (random practice) showed a better results learning volleyball basic skills than the first group (blocked practice).

The main differences between this study and the previous study is that this study was focusing on tennis basic skills while this study aimed to measure the learning progress for volleyball basic skills. Both studies used the quasi-experimental design. The number of subjects for this study was 20 while the current study number of subjects is 90 students. This study showed that there was more increase in learning the basic skills for the blocked group while the current study showed that the group that learned better was the random group.

The study of Jamal (2016) titled "practice scheduling effect on learning shooting from different positions in basketball for primary school students" the main purpose of the study was to determine which type of practice is more effective to

improve the shooting skills from different positions in basketball among primary school students. The two types of practices were the blocked and random practices. The population of the study were 90 students selected randomly at Al-Shaab school in Baghdad, Iraq. The students were divided into 2 groups of 45 students each. First group used the blocked practice as a treatment method, while the second group used the random practice as a treatment method. The results after the post-test showed that there a significant difference between the pre-test and the post-test for both groups blocked and random. However, the second group which is the random group showed a better result than the group that followed the blocked practice.

There are few differences to mention between the two studies. First different is the age of the students. The previous study's population are a primary school student, while this study uses a university level student as a sample. The other difference is that the previous study uses the experimental design while this study uses quasi-experimental design. The previous study was measuring shooting skill in basketball, while this study is measuring forehand and backhand basic skills in tennis. The population for the previous study were 90 students same as this study. Both studies show an increase in skill acquisition for the random practice group.

The study of Aiken (2018) titled "the effect of blocked and random practice on learning three variations of the golf chip shot" this study is aiming to investigate learning the golf chipping task by using random and blocked practice scheduling. The subject were 24 students who had to perform a five and a half meter chipping shot where they had to practice from 3 different positions. The subjects were divided into 2 different groups. The first group used the blocked practice where they had to practice their shot from one specific spot and later move to the other spot. The second group used the random practice scheduling where they had to practice all the shot

from the three different spot without repeating the dame shot from the same spot. Total of the trials used was 54 trials for each subject. A retention test was conducted for both groups 10 minutes later after the first test. The acquisition contained 45 total trials. The results of the retention test showed that there was no significant difference between the blocked practice group and the random practice group. The results suggests the increase of the contextual interference during practicing golf chipping shot can facilitates learning. The subjects are required to seek more contextual interference while teaching amateur golfers.

The main differences between this study and the previous study is that this study is aiming to measure the increase in golf chipping skill while the previous study is aiming to study the differences in improving tennis basic skills. Both studies showed an increase in the level of skills in the retention test. However, the previous study showed there was no significant difference in the level of skill between the blocked and the random practice in the retention test.

The study of Scheiner (2011) titled "The effect of blocked versus random practice on nonword acquisition and retention". The aim of this study was to examine the effect of 2 different practice scheduling which are blocked versus random practice regarding the motor learning in a context of the speech production. More specifically, the acquisition and the retention of the motor speech sequence motor the (nonwords) among healthy adults. The subjects went through a different amount of practice in both random and blocked order on the first day. Later the subjects were tested using the retention test on the following day. The timing's kinematic measure (duration variability, duration and the relative duration relativity) the measure of the behavioural accuracy was obtained for 4 time points during learning on the first day and during the retention test on the second day. To measure the 2 primary hypotheses:

First: the group that used the blocked practice schedule would outperform the group that used random practice method on the accuracy measures, duration variability, duration and relative variability during learning.

Second: the group that used random practice schedule would outperform the group used blocked practice schedule during retention tests using the same outcome measures. However, the blocked practice scheduling group was outperformed by the random practice schedule group during the second day (retention test). There was a significant difference between the groups in terms of accuracy only.

The differences between this study and the current study is that this study has a shorter time of intervention. This study compares blocked and random practice scheduling in terms of not just learning but retention as well. This study has a fewer number of subjects and the main goal was to measure the differences in two different phases which are acquisition and retention.

The study of Horbacewicz (2018) titled "The effect of blocked versus random practice on physical therapy students". This study examined the following aspects:

First: practice scheduling effect on acquisition the modulate manual force.

Second: the effect of force magnitude on student's ability to reproduce force accurately. The researcher selected fifty-two students of novice physical therapy to either random practice or blocked practice schedule as the students had to learn applying different force manual. The students were tested immediately after their training. One week later, using a 3 way analyses of mixed design of variance to measure the effect of blocked and random practice scheduling. A retention test versus a post-test forces a high versus a low on capability to modulate the manual forces. The researcher has discovered that the random versus blocked practice scheduling showed more accurate force application during the post-test and during the retention

test. Both blocked and random practice groups increased performance during the lower as compared with the higher force level.

Findings of this study showed that the use of the blocked schedule for this specific motor skill to the relevant contextual interference might include this types of variables as the nature of the task, practice time and the learner's skill level. Moreover, the higher forces can result in higher error and should be considered in the preparing for engaging during the clinical trials.

The differences between this study and the current study is that this study didn't include a controlled group as a way of comparison and only compared the blocked practice schedule to the random practice schedule. This study used a mixed type of design for the analyses of the variance to measure the effect of the contextual interference.

Another similar study was conducted by Najmuldin and Hussain (2015) "The effect Of Using Three Teaching Styles On The level and Frequency of Performing Forehand and backhand Shot In Tennis". The study aimed at studying the effect of three teaching styles in physical education (Empirical, practical and self-evaluation of performance) on the level of performing forehand and backhand shots in tennis. In addition to that the study aimed at making a comparison between the three teaching methods understudy on the level and frequency of performing forehand and backhand shots in tennis.

The problem of the study lies in not using other methods for teaching save the traditional method. The researcher hypothesized that there are no statistical differences between the pre and post-test in forehand and backhand shot among the three teaching methods. The researcher hypothesized that there are no statistical

differences in the level of performing forehand and backhand in tennis after applying the three teaching methods. The researchers used the experimental method.

The subjects were 42 third year students of the collage of physical education/ university of Sulaimania. The subjects were divided into three teaching groups. Three teaching methods were used: Empirical, practical and self-evaluation method. The pre-tests were conducted then followed by the teaching methods ending in the post-test. The researchers used many statistical operations to treat the results like T-test, standard deviation and mean.

The results showed that using three methods of teaching have a positive effect on learning forehand and backhand shots in tennis. When comparing between the teaching methods it appeared that the practical method is the best in teaching forehand and backhand shots in tennis. In addition to that the results showed the frequency of performance was positive indicator for high achievement. Finally all the teaching methods can be used for developing the level of the students while learning forehand and backhand shots. The researcher then recommended using the teaching methods understudy for teaching forehand and backhand shots in tennis and making similar studies on other groups and other teaching methods.

The different between this study and the current study is that this study used experimental approach rather than quasi-experimental one and used a three different teaching styles instead of two also the research covered only two skills in tennis which are backhand and forehand shots and had a less number of subjects in a different collage.

The study of Khani (2013) "the effect of contextual interference on acquisition and learning badminton skills among children aged 10 to 12". This study aimed to measure the effect of the practice of the contextual interference in terms of learning

and acquisition for badminton basic skills for a forty-five female students in the age range between 10-12 years old. The subjects of this study was randomly assigned to a three different groups which were random, blocked and systematically increased contextual interference. The subjects were trained for a 3 different skills in badminton which are the forehand stroke, the long and the short serve for a total of a ten sessions after the pre-test. These tests used includes immediate retention, acquisition and delayed retention that was taken after the 5th session. Forty-eight hours after the last session. The findings of the study showed that during the acquisition test, the group that used blocked scheduling made a better score than the random schedule group and than the systematically increased group despite the fact that all the three groups did perform significantly higher during the pre-test in the retention test. There were no significant differences among the three groups. The effect of the contextual interference didn't show positive results for subjects that was learning badminton skills. Moreover, because of the similarities in the strategy, the subjects were possibley confused about the abundant information because of the random practice scheduling and didn't benefit from using the advantages of the contextual interference effect. Therefore, the advantages of the random practice scheduling were based on forgetting and the elaborating hypotheses in this group. Regarding the hidden motor skills in badminton is in doubt. The researcher suggests that the physical education teacher in the elementary schools should be using block practice scheduling for the badminton training in order to help the students to build a better motor skills and to encourage them to repeat that wanted skill because of the feedback motivation of the block practice schedule to achieve success during the practice sessions.

The main differences between both studies that the current study showed a higher success in random practice group. The age ranged of this study was 10-12 and it was mentioned before that blocked practice works better for beginners due to the low complexity of its tasks. The skills used in this study was in badminton while the current study focused on tennis. The current study used traditional practice for the controlled group while this study used systematically increasing approach.

2.14   Other Styles of Practice on Basic Skills in Tennis Related Studies

Another Study was conducted by Jassim (2011) with title "the impact of capacitor and various practice in skill performance in handball for the students of collage of physical education in the University of Dyala". The purpose of the study is to investigate the importance of the impact of capacitor and various practice in skill performance in handball for level 2 students. The researcher aimed to identify the impact of using these proposed styles versus the traditional styles implied in the curriculum on learning skill performance in handball for the university students and to select the best style among them.

The researcher followed the empirical method in for it being suitable with the nature of the research. The subjects were 54 students and they were divided into two groups the first followed the empirical style while the second was the controlled group. The researcher concluded the fact that: the capacitor and the various had a positive impact on the skill performance of the students of the collage of physical education at the university of Dyala. While the classic style (traditional) showed no positive impact on skill performance for the controlled group.

The researcher suggested that; to utilize using the suggested learning programs for the students and using the same program for other subjects regardless of (age, sex and skill level). This study used the empirical method, number of subjects were only

54 students. The two different styles of practice used in this study are the capacitor and the various to see the impact of those styles in performing basic skills in handball.

The study of Ali and Shareef (2012) "The effect of both peer tutoring style and the triple reciprocal style in acquisition of technique for some tennis basic skills". The aim of the research was to reveal the following: to measure the effect of both styles peer tutoring and triple reciprocal in learning tennis basic skills technique for the experimental research samples.

For the research design, the researcher used the experimental approach for it more suitable for the nature of the study. The sample consist of 26 university students at level 3 who were selected randomly at the collage of physical education university of Mosul for the term 2011-2012. The samples were divided into two groups representing 14 students in the first experimental group which was the (peer tutoring style), and the second group consist of 12 students who learned using (triple reciprocal style).

The final conclusion of the research was as following: 1- both of the styles (peer and triple reciprocal style) has a significant effect on learning the technique of basic skills in tennis (serve, forehand and backhand. 2- The first experimental group that used peer style showed a higher level of learning the technique of the tennis basic skills as compared with the second experimental group that used triple reciprocal tutoring style.

This study's approach was to investigate the effect of both peer tutoring style and the triple reciprocal style in learning basic skills in tennis, missing one other major skill which is volley, the learning styles are different from the current study and the aim was to see the impact of only acquisition of the skill.

The study of Ahmed and Abis (2010) with title "the effect of intensive and distributive learning style on improving the performance and transfer of learning in some tennis and badminton skills". The subjects were 60 female students of Babylon University. An experimental design was used in this research, 2 experimental groups and 1 controlled group, the approach was to imply 2 different learning styles to determine which is more effective in improving performance and which style is more effective in learning transfer between tennis and badminton.

The results showed that the intensive learning style was more effective than the distributive one also showed a positive transfer of learning in forehand between badminton and tennis the difference between the current study and this study is that this study used different types of learning styles which are (intensive & distributive) rather than (blocked & random) and also didn't have a second post-test for retention and included transfer of learning between 2 different racket games

Another similar study was conducted by Najmuldin and Hussain (2015) "The effect Of Using Three Teaching Styles On The level and Frequency of Performing Forehand and backhand Shot In Tennis". The study aimed at studying the effect of three teaching styles in physical education (Empirical, practical and self-evaluation of performance) on the level of performing forehand and backhand shots in tennis. In addition to that the study aimed at making a comparison between the three teaching methods understudy on the level and frequency of performing forehand and backhand shots in tennis.

The problem of the study lies in not using other methods for teaching save the traditional method. The researcher hypothesized that there are no statistical differences between the pre and post-test in forehand and backhand shot among the three teaching methods. The researcher hypothesized that there are no statistical

differences in the level of performing forehand and backhand in tennis after applying the three teaching methods. The researchers used the experimental method.

The subjects were 42 third year students of the collage of physical education/ university of Sulaimania. The subjects were divided into three teaching groups. Three teaching methods were used: Empirical, practical and self-evaluation method. The pre-tests were conducted then followed by the teaching methods ending in the post-test. The researchers used many statistical operations to treat the results like T-test, standard deviation and mean.

The results showed that using three methods of teaching have a positive effect on learning forehand and backhand shots in tennis. When comparing between the teaching methods it appeared that the practical method is the best in teaching forehand and backhand shots in tennis. In addition to that the results showed the frequency of performance was positive indicator for high achievement. Finally all the teaching methods can be used for developing the level of the students while learning forehand and backhand shots. The researcher then recommended using the teaching methods understudy for teaching forehand and backhand shots in tennis and making similar studies on other groups and other teaching methods.

The different between this study and the current study is that this study used experimental approach rather than quasi-experimental one and used a three different teaching styles instead of two also the research covered only two skills in tennis which are backhand and forehand shots and had a less number of subjects in a different collage.

A study conducted by Ismail and Mohamed (2013) "The effect of two teaching styles whole and part in executing coordinative arm skills in tennis". The objective

of the research was to investigate the part and whole method in accuracy performance for coordination skills by both arms in tennis.

The subjects were 30 students enrolled in second stage of physical education college in Sulaimania University. The subjects divided into three groups. Each group included 10 students. The test was Hawite test for forehand and Backhand strokes. The results revealed that all groups had improved in Learning Backhand and forehand strokes in tennis. The best one was the third group that used both arms in striking the ball. The recommendation of the study was to use all three type of learning with emphasizing on using both arms in strokes that carried power and velocity.

The differences between this study and the current study was that this study used experimental approach and the number of the subjects were 30 students only. This study used 2 different teaching styles which are the part and whole styles that divided the skill to few parts and teach each part alone and combine all together. The whole style where the teacher explains the whole motion of the skill and teach it to the students and they practice it. However, the current study divides each skill and used different teaching style on each of these skills. The population was larger. And the styles of teaching are different according to prescheduled program.

A study conducted by Mohamed (2013) with the title "Effect of teaching by constant practice and varied practice in different distance for some tennis skills and retention". The study objective was to study the effect of teaching in constant practice and varied practice for some tennis skills. The subjects were 30 students enrolled in second stage training department in physical education college at University of Sulimany.

The subjects were divided into three groups equally. Ten students in each group. The first group used ordinary teaching, second one used constant practice, third one used varied practice for learning forehand and backhand tennis skills. The result revealed that all of the group had effect on learning the skills. The best group was varied practice while the best group on retention was second group (Constance practice).

The difference between this study and the current study was that this study used 2 different teaching styles which are (constant practice and varied practice). This study measured learning and retaining of the tennis skills. Subjects were 30 students and the approach of this study was experimental.

The study of Tawfik (2009) "The effect of massed and distributive practice on tennis basic skills for junior players" the aim of this study was to examine two different types of practice which are the massed and the distributive practices on all the tennis basic skills which are (forehand, backhand, serve, volley and slice) for junior tennis players aged between 5-8 years' old who are regularly attending tennis classes at Baghdad tennis academy. Forty players were selected randomly among 200 players falls in the same age range. A quasi-experimental design was selected as method to conduct the experiment of this study. A pre-test was conducted for all the subjects to measure their ability to perform all the tennis basic skills. 2 months treatment was imposed by the academy's coaches for two sessions a week. After the treatment period, a first post-test was given to all the students to measure their ability to perform the skill. Later on, a second post-test was given to measure the player's ability to retain those basic skills learnt two weeks after the first post-test. The results showed the the students who used the massed practice showed a better results in the

first post-test, while the group that used distributive practice showed a better results retaining tennis basic skills during the second post-test.

The main differences between this study and the current study is that the age of the subjects is older 21 years old vs 5-6 years old. Both studies used the quasi-experimental design as an approach to conduct the experiment. However, the current study is using block vs random practice while this study is using massed vs distributive practice for teaching the tennis basic skills. This study used 2 post-tests, the first was to measure the ability of the student to learn the skill, while the current study is using only on post-test to measure the student's ability to learn tennis basic skills. This study is examining the effect of its treatment on all the tennis basic skills (forehand, backhand, serve, volley and slice) while this study is focusing on only two tennis basic skills which are the forehand and the backhand.

The study of Mijbil (2011) titled "The effect of fixed and variable practice on tennis footwork skill for advanced tennis players" the aim of this study was to measure the effect of two different types of practice on improving positioning and frequency of footwork skill for advanced tennis players (Iraqi national team participated in Davis Cup at 2009-2010). The sample contained 20 Iraqi national team players who were divided into 2 groups. The first group used fixed practice while the second group used variable practice for their footwork workout pre and post training sessions. The duration of the practice program was 4 months 3 sessions a week at Aquapark city tennis courts during the team post-season. A pre-test was conducted before the practice program starts, followed by a second test after the treatment period ended. The results showed that there is a significant difference in the frequency of the footwork for the first group (fixed practice) than the second group (variable practice).

The main difference between this study and the previous study is that this study's sample number is much higher (90) than this study which is only (20). The previous study's sample are considered as an advanced player as compared to this study. Meaning the differences are the number and the training age for both studies. The previous study is focusing on the physical element of the sport which is the footwork rather than the skill part of the sport which are the basic skill (forehand, backhand, serve, volley and slice).

As shown above, every other study conducted in the same field has its own approach and benefits, therefore, this study has a main focus which is improving the most important skills in the sport which are forehand and backhand. This study provides the lecturer with a solid base training program that is following world class standards and used by the most popular coaches in the sport. The sampling number is higher than the sample number in the other studies which can be considered a major representation of the whole population. The study covers a long period of which make the experiment more eligible to be considered using in the university curriculum.

2.15   Conclusion

According to Sherwood and Lee (2003) the type of practice scheduling that requires more cognitive effort which is in this case the random practice, is more effective for motor learning. While blocked practice on the other hand which is usually requires less cognitive effort is less effective for motor learning specifically.

The reconstruction and elaboration hypothesis also supports the claim that the random scheduling of the practice requires higher cognitive activity. According to Keller, Lee, Weiss and Relyea (2006) both hypothesis shows the importance of the

control process role, such as task comparison, response selection and the process that involved in the reconstruction of the action-plan.

However, Schmidt's schema theory focuses on the advantages of the random practice and how they can have a better retention. Also, it shows how blocked practice of a single task can enhance learning for a shorter period of time.

There are few important reasons why the researcher has selected the Schmidt's schema theory one of them is that the complexity and intensity of the sport. Open skills such as tennis basic skills requires high repetition in order to master the skill which make blocked practice very suitable. The constant changing of the selected skills is fully dependent on the change in the environment and that makes random practice more effective. The high number of studies that used blocked and random practice for similar sports is noticeable. Finally, the program that is designed by the researcher is very effective considering major tennis academies follows a similar patterns of teaching tennis and most of these programs are blocked and random practice based. Therefore, in the researcher's opinion, Schmidt's schema theory would have greater impact in improving tennis basic skills as compared to other types of practices or teaching styles.

CHAPTER 3 METHODOLOGY

3.1 Introduction

In this chapter, the researcher will show the structure of the study in details by showing the design of the study and the reason for selecting this design alongside with the population and sampling. The procedure of the study is discussed in this chapter that contains the training programs implied on which relates to the blocked, random and traditional practice. This chapter also explains the selected tests that are used to evaluate the skill development with the validity and reliability of these tests. Finally, the researcher will discuss the data analysis and the descriptive statistics.

3.2 Research Design

For this study, a Quasi-experimental design was selected (Creswell, 2012). The objective of the study is to determine the effect two different practices (blocked and random) on learning basic skills in tennis for university students. To maximize the possibility an effective procedure and valid results, there must be a controlled and treatment groups. The treatment groups are divided into two groups. The study conducts a pre-test to each group to identify their basic skills in tennis differences, the controlled group is not provided with any treatment, and the students are following the traditional teaching style that is usually held during the class. The first treatment group receives blocked practice while the second treatment group w receives random practice for a duration of 6 weeks.

3.3 Study Location

The classes are held at the collage of physical education tennis courts. The class's duration is 90 minutes for a two classes a week for a total of 6 weeks with a total of 2 classes a week means the total sessions conducted are 12 sessions. After that period

the post-test is held for the three groups to identify whether learning had taken place and compare the learning level among the three groups.

Quasi-Experimental Design (Pretest and Posttest Design).

Table 3.1

Pre-test and post-test design (Creswell, 2012)

Select Control Group Pre-test		No Treatment	Post-test	
Select experimental Group	Pre-test	Experimental Treatment	Post-test	
Select experimental Group2	Pre-test	Experimental Treatment	2	Post-test

This selected design is most accurate and suitable design to find out the outcomes and to overcome the complications and to identify which of the learning styles is more effective in terms of learning and basic skills in tennis for the University students.

3.4 Population and Sampling

The population of this study includes year 3 male students of Physical education and sport sciences University of Baghdad (tennis courts at sport faculty) with the age range of 20 to 22 who are regularly having tennis classes which is at least one class a week. A random sampling method was selected for this study for it is more suitable for the nature of the study and the high number of student in each class. According to Cresswell (2012) the random considered as a process selecting individuals randomly to a group or different groups during an experiment. This random assignment of a selected individuals to a group or conditions with the same group

differentiates a rigorous (true) experiments from adequate, however, less than rigorous, "quasi-experiment".

Random assignment was used there is no bias in the personal characteristics because it can provide full control for these characteristics of the subjects which might affect the outcome such as the ability of the student, the attention soan and the motivation. The process of such an experimental is done by equating the group's means that the researcher randomly assigned the subjects into the groups and distributed equally all variability of the subjects among the groups of conditions in the experiment.

The personal factors in practice that the participants bring the experiment cannot be totally controlled, the bias and error usually effect the outcome of the study. However, if any potential errors among the groups was a systematically distributed, the researcher can theoretically randomly distribute the bias.

The sample will be 90 students (30 students from each group), And the three different groups will use a different type of practice, the first group will learn using the traditional method that have been used in the university curriculum, while the second group will learn using blocked practice and the third group will learn using random practice.

3.5   Procedure of the Study

The main purpose of this study is to determine the effect of the random and blocked practice scheduling on learning tennis basic skills. This study includes 2 different treatment groups and a single controlled group. Each group contains 30 subjects that's rendering a total number of 90 students for the whole duration of the study. Two tests were given (pre-test and post-test) was taken by each subject. The number of contact sessions was 12 given to each group alongside with their specific

treatment. after conducting all of the twelve sessions, the subjects were given a post-test to determine the level of improvement in the given tennis basic skills depending on which treatment. The statistical analyses of every group's data included the analyse of ANCOVA, paired T-Test and independent T-Test used in this study. The procedure that the pre-test and the post-test and the intervention application was conducted by specialized lecturers in tennis in physical education.

3.5.1 Controlled group program

The controlled group consist of 30 subjects. The total time for the tennis class lesson is 90 minutes for 2 classes a week. It starts with the general warm-up the followed by the specific tennis warm-up exercises. The main section of the class is about 60 minutes. It consists of two parts which are the theoretical and the practical in order. The theoretical part mainly divided teaching the lows of the sport and teaching the biomechanical part of each skill and how it should be conducted properly by the teacher or the role model. The second part is the practical section. It's where the students will be trying to conduct that specific skill. The last part is the warm-down section. The students here should perform a static stretching to recover the muscles and restore energy.

The different between the controlled group and the other 2 experimental groups is that the controlled group will be conducting one skill each session and move to the next skill in the next session as well. There is no clear scheduling in distributing these skill, as random practice requires mastering one skill before moving to the other while random practice is where the player must conduct all the skills at each session.

Table 3.2

Lesson plan for the controlled group

1- Preparation section	2- Main section	3- Final section
A- General warm-up The Duration of the general warm-up is 10 minutes and it involves jogging, dynamic stretching and foot-work exercises.	A- Theoretical The duration of this section is 20 minutes and it involves explaining the skill/skills + explaining the biomechanical aspects + conducting the skill/skills by the lecturer or the role model.	A warm-down, Light jogging for 1 round around the court + static stretching.
B- Specific warm-up The duration of the specific warm-up is 10 minutes and it involves wrist, elbow and shoulder dynamic rotation+ plank to activate the core + rope skipping. This warm-up is specialized in activating the specific muscles that are involve in conducting any of the tennis basic strokes.	B- Practical. The duration of this section is 40 minutes dividing the skill into 3 parts (back swing, front swing and follow through) + conducting each part separately by the students + connect all the parts.	

3.5.2 Experimental Groups Program

The differences between all three groups are during the main section (theoretical and practical). The warm-up and the cool-down section are the same in all three groups' lessons. However, for the main section, the experimental groups practices scheduling follows the random and blocked practice. The experimental group1 will try to conduct one skill each day for three days and will not be allowed to conduct any other skill before the 30 days' period finishes. On the contrary, the

experimental group2 will be conducting all 4 skills every day and will not allowed to

practice any specific skill more than the other during the classes.

Table 3.3

Lesson plan for the experimental groups

1- Preparation section	2- Main section	3- Final section
A- General warm-up The Duration of the general warm-up is 10 minutes and it involves jogging, dynamic stretching and foot-work exercises.	A- Theoretical Contact: explaining the skill + explaining the biomechanical aspects + conducting the skill by the lecturer or the role model.	A warm-down, Light jogging for 1 round around the court + static stretching.
B- Specific warm-up The duration of the specific warm-up is 10 minutes and it involves wrist, elbow and shoulder dynamic rotation+ plank to activate the core + rope skipping. This warm-up is specialized in activating the specific muscles that are involve in conducting any of the tennis basic strokes.	B- Practical The practical section is where the intervention happens. For the experimental group1 the student will taught one skill and conducting this skill for 3 classes then taught new skill and conducting it for 3 classes and so on. For the experimental group2 starting from the first day will be taught all four skills and start conducting all 4 skills at each session. The duration of this section is around 60 minutes.	
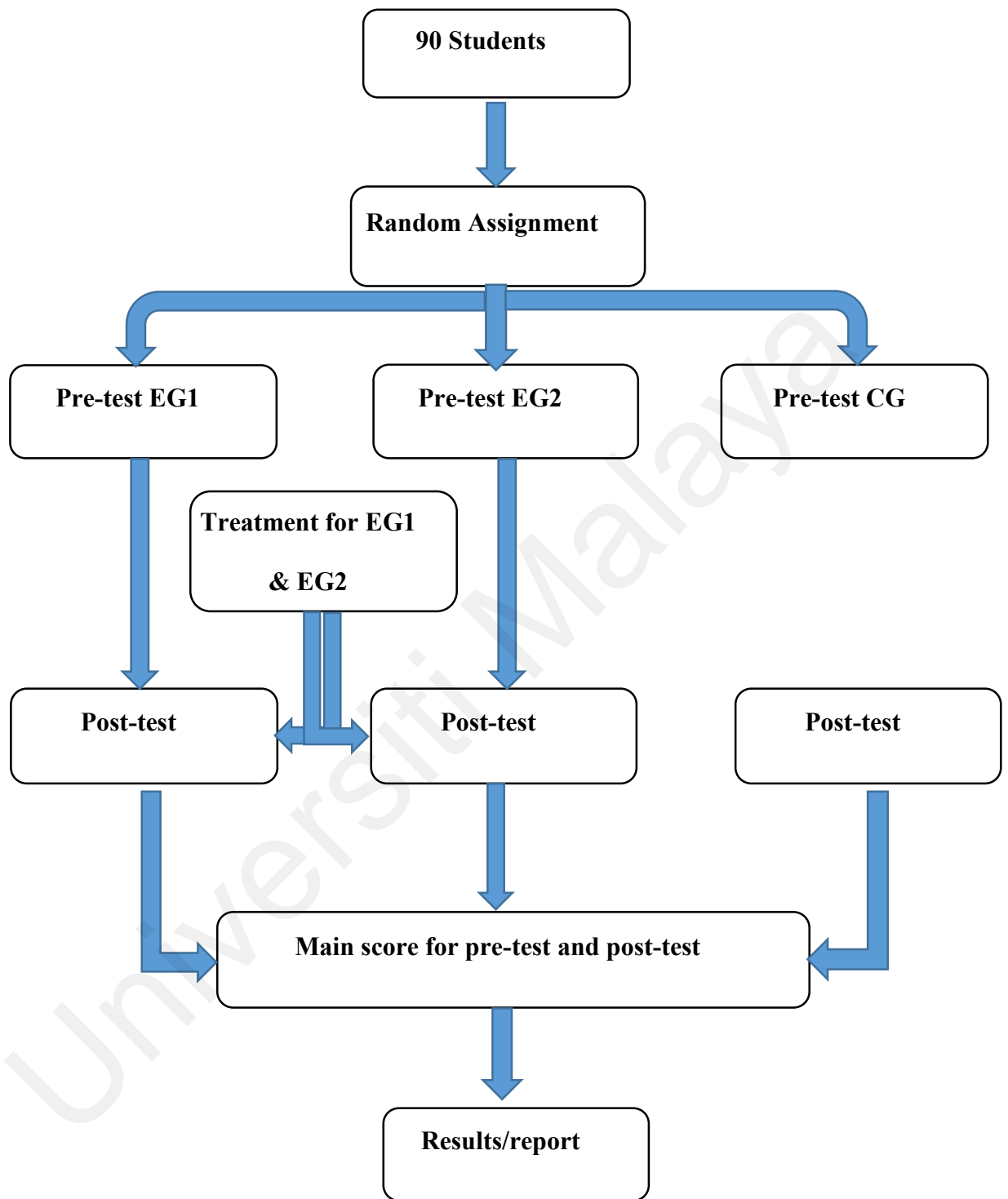
Figure 3.1. The procedure of the study

3.6   Instruments

3.6.1   Selecting the Tests.

The researcher has elected three different tennis skills tests and the reason for that was to insure there is more focused on testing forehand and backhand basic skills. The approach was identifying which tests are more appropriate for the nature of the research and it was viewed by a committee of experts in the areas of tennis and measurement and evaluation representing college, high school, and Junior high school grade levels. The researcher used a questionnaire containing all three tests and included with type of these tests and the procedure for each of them.

The first task for the committee was to identify the essential skills of the sport of tennis.

Based upon the task analysis completed, the committee identified two essential skills that are requisite to playing tennis: ground strokes (forehand and backhand).

Considerable setup in terms of equipment and markings, but such features would pre-clued the use of this test in a traditional university setting. Conversely, those tests which required only a few trials or limited admin-iterative setup were often found to be lacking in scientific authenticity. Based upon the information obtained from the pilot study, the specific test items and administrative procedures were developed.

For instance, it was found that the best measure of stroking ability was a composite score involving both the forehand and backhand. Furthermore, both the ground stroke tests -ought to incorporate a measure of both placement and power in the found score.

The first proposed test was Hewitt tennis test by Hewitt (2011) which was most focused on the tennis server skill and contained three different types of ground-stroke

tests. For the ground-stroke test procedure it covered three different aspects which are the placement of the ball (the point where the ball lands on the court), speed and height of the ball after the bounce which required specially placed camera for such a measurement.

The second suggested test was Tennis Ground-stroke tests by (Ahmed, 2011). This test mainly focused on forehand and backhand strokes. This test essentially requires a high number of trials for each basic skill and it to measure placement and speed of the ball.

The third test was (Tennis test skill manual) (Hensley, 2013). This test had the approach of combining the placement and speed of the ball in one single score and in order to measure the speed of the ball it simply measures the second bounce of the ball after the placement behind the court (the further the ball from the baseline, the faster it is).

The table below shows the experts of tennis and measurement regarding the tests after they were briefed with the current study's approach and the skills involved in this study.

Table 3.4

Experts votes regarding the selected tests

Test Name	Votes percentage
(Hewitt Tennis test) Hewitt. J. E. (2011).	25%
(Tennis test skill manual) Hensley. L. D. (2013).	60%
(Tennis Ground-stroke tests) Ahmed. A. K. (2011)	15%

3.6.2 Ground Stroke Tests (Forehand & Backhand):

Purpose.

The purpose of this test is to measure the student's ability to conduct the groundstroke for both power and accuracy.

Equipment.

Tennis court, racket, a box of tennis balls (10-42 balls per test court is recommended), and tape or chalk for marking target area on court.

Target area

Two parallel lines to the baseline that are extending alongside the single court. Those two lines marks a distance of six feet and twelve feet from the baseline. In addition, a third line, parallel to and 9feet from the baseline is marked outside the court.

Directions.

Prior to taking the test, all students are permitted warm-up period of approximately 5 minutes. The student takes a position at approximately the location of the centre mark of the baseline, yet remaining behind the baseline as shown in Figure1. The tester is stationed with a tennis balls box side by side with the net within a distance of approximately three feet away from the net alongside the centre line.

By using the overhead throwing technique, the teacher is required to through twelve balls toward the forehand side of the student, followed by 12 balls to the backhand. First two thrown balls to each of the sides serving as in practice, with the remaining 10 trials scored. The tester should attempt to toss the ball so that it will land beyond the service line on the desired side and within approximately 6 feet of the student. The student may elect not to swing at a total of 2scored tosses for each test item and request that additional tosses be made. (This decision must be made prior to attempting to return the ball. Consequently, no swing should be made.) The

student should attempt to hit the ball over the net into the designated scoring area within the singles court.

Scoring.

Each of the 10 designated trials for both the forehand and backhand drives is scored for both placement and power. The placement score is determined according to the target area in which the ball lands (see Figure 2). Shots landing deeper in the court receive the greater point values. For each of the legal return shots which lands in the designated scoring area, an appropriate score is awarded for power (i.e., 1, 2, or 3) according to bounce distance as determined by the power zone in which the second bounce lands. Balls that are wide, long, or hit into the net receive a score of 0 for both placement and power. A student's score is the sum of the placement and power score for each of the scored trials. The forehand and backhand trials are combined for the total score.
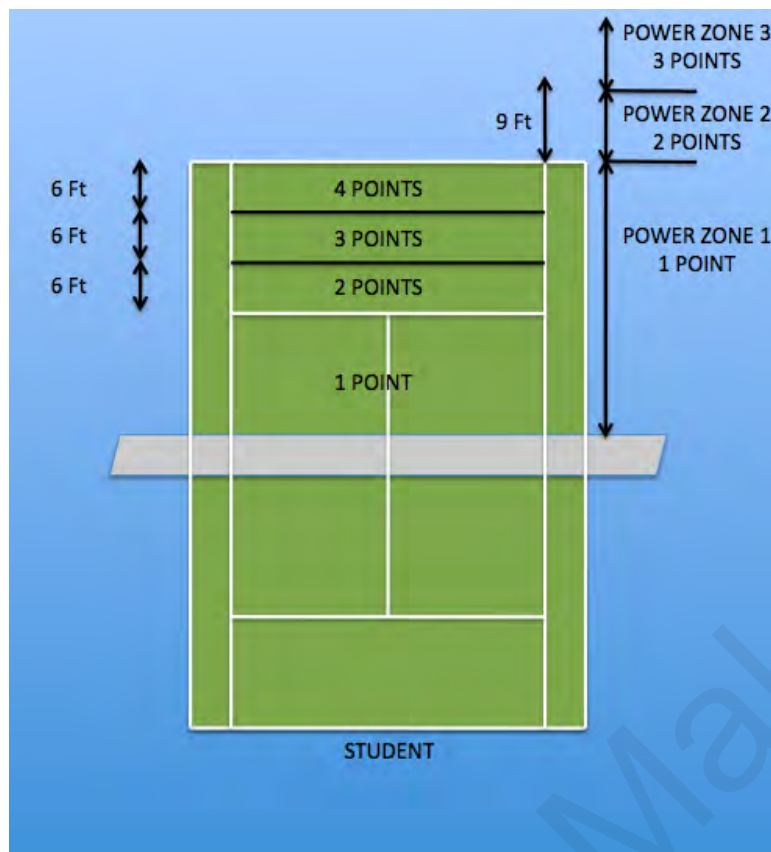
Figure 3.2: Ground stroke test (forehand & backhand)

3.7   Validity and Reliability

Table 3.3 shows the validity and reliability of the tests selected for males and females university students. In order to design this specific test by Hensley (2013) a pilot study was conducted for different skill levels including, high schools and collages for both males and females with more than 400 students in order to measure how reliable the tests are. In the opinion of the author (Abbas 1996) reliability has to do with the delivery of consistent and accurate test results through the utilization of dependable instruments. For female students, the validity of the forehand stroke was 80% while the reliability for the same stroke was 78%. However, for the backhand stroke the validity remained the same while the backhand stroke showed a slight decrease by 7%. Males on the other hand had a higher validity an=d reliability for both strokes. Forehand validity was 88% which is the highest among both strokes for

both sexes while the reliability was 81%. Backhand validity was 87% while the reliability for the same skill was 77%.

Table 3.5

Validity and reliability of the test

	Validity		*Reliability*	
Test item	Males	Females	Males	Females
Forehand	88	80	81	78
Backhand	87	80	77	71

3.8 Data Analyses

The data analyses for this study will be associated with block, random and traditional practice on basic skills in tennis. The data that will be collected from the experimental and controlled groups through the tests will be analysed using descriptive statistics, such as the mean and inferential statistics ANOVA, ANCOVA and multiple comparisons. The first statistical analyses will be using ANCOVA to show the significant differences in using random, blocked and traditional practice in post-test mean score.

The multiple comparison method will be used to identify which of the three styles of practice (blocked, random and traditional) are the most effective on improving learning basic skills in tennis. Farther more will use the Assumptions of ANCOVA such as assumption of normality, assumption of homogeneity and assumption of regression slopes.

For the assumption of normality, the skewness value must be ranging between negative 1 to positive 1 is in order to be normally distributed. While Kurtosis value for all groups should be ranging between -2 to +2. In the assumption of homogeneity of variances which is conducted by Levene's Test of Equality of Variance shouldn't

be significant (p>.05). Only by then, the variances will be approximately equal. The procedure of assessing the homogeneity of regression slopes, if it was statistically significant, means the assumption was not violated. The significant level should be more than 0.05 (P> 0.05). The relationships between the factors and the dependent variable cannot be interpreted because the interpretation changes when the values of the covariate differ. For the ANCOVA test between the variables According to Cohen (1988) the value of eta ranging from .1 to .3 is regarded as small, those of .3 to .5 as a medium, and those .5 and over as large. In the Multiple Comparisons (Post Hoc Test, scheffe), the group with the higher value will be considered the one that has the higher effect among the other groups and vies versa. All the statistical analysis will have performed using statistical package for the social science (SPSS).

Table 3.6

Research questions in this study by details

Number	Research questions	Statistical analysis
1	Is there a statistical significant effect of blocked practice on tennis forehand basic skill?	One-way ANCOVA & multiple comparisons
2	Is there a statistical significant effect of random practice on tennis forehand basic skill?	One-way ANCOVA & multiple comparisons
3	Is there a statistical significant difference between blocked practice and random practice on tennis forehand basic skill?	One-way ANCOVA & multiple comparisons
4	Is there a statistical significant effect of blocked practice on tennis backhand basic skill?	One-way ANCOVA & multiple comparisons
5	Is there a statistical significant effect of random practice on tennis backhand basic skill?	One-way ANCOVA &multiple comparisons
6	Is there a statistical significant difference between blocked practice and random practice on tennis backhand basic skill?	One-way ANCOVA &multiple comparisons

3.9   Summary

this section describes the various investigative procedures used in all structure provided. It also covers explanation for the quantitative techniques employed, including population, instruments, data recording and test procedures. Furthermore, it describes the training programme and methods applied in the practice for both experimental groups which are blocked and random practice.

CHAPTER 4 RESULTS

4.1 Introductions

The chapter is presenting the findings from the data analyses. This data was collected and processed in the response to the research problem that was posed in chapter one of this research. The four fundamental objectives that drove the data collection and the data analyses. These objectives purpose was to investigate the effect of blocked and random practice on learning tennis basic skills among university students. Six of these objectives was accomplished. The findings of this study showed in this chapter explains the inferential statistic of all of the variables. Including the difference between the 2 experimental groups and the controlled group, also the differences in the scores of the 2 experimental groups before and after using blocked and random practice scheduling teaching approach implemented.

Two statistical techniques were used to interpret the findings: Analysis of Covariance (ANCOVA) and Multiple Comparisons. ANCOVA was employed to examine and compare the differences between experimental and control groups on blocked & random practice on tennis basic skills, while Multiple Comparisons was used to detect the differences of experimental group only, before and after treatment. Both analyses were undertaken by using SPSS version 22.

4.2 Testing the Assumptions of ANCOVA

In order to compare the differences between experimental and control groups, an analysis of covariance (ANCOVA) on the post-test scores with the pre-test scores as covariates was conducted. Thus, the independent variable in this study are random practice, blocked practice and traditional practice; while the dependent variable was the post-test scores; and the covariates was the pre-test scores. Prior to the analysis, several assumptions of ANCOVA were first tested. They are assumptions of independency, test of normality, homogeneity of variances, and homogeneity of regression of slopes.

4.3 Assumption of Independence

The convenience sampling technique is the best way of ensuring that the observations are independent. This design issue was addressed prior to data collection. In this study, the respondents came from three classes and were randomly assigned into two experimental groups and control group using 'hat and draw' method, so the observations are independent. In addition, the researcher dissuaded any relationships among participants in the study.

4.4 Assumption of Normality

This assumption requires dependent variables to be normally distributed. If the population distributions are not normal and sample sizes are small, p values may be invalid, and the power of ANCOVA tests may be reduced. The assumption of normality was checked with skewness values. Table 4.1 shows the skewness values for each construct.

Table 4.1

Descriptive statistics of Assumption of Normality

Group		Skewness	Kurtosis	Std. Error
CG (Traditional)	Forehand post	- .008	- .859	.427
	Backhand post	.293	- .666	.833
EG1 (Blocked)	Forehand post	- .011	- .613	.427
	Backhand post	- .142	- .323	.833
EG2 (Random)	Forehand post	.345	- 1.131	.427
	Backhand post	.008	- .501	.833

According to authors (Gupta, Nguyen et al. 2003), the skewness value ranging from negative 1 to positive 1 is consider normally distributed. The values of each construct were between -1 to +1, so the assumption of normality has been achieved. As such, Forehand test scores and Backhand test scores for all three groups were normally distributed among the control and two experimental groups. Furthermore the Kurtosis value for all groups is ranging between -2 to +2.

4.5   Assumption of Homogeneity of Variances

Homogeneity of variances assumes that all groups have the same or similar variance. Levene's Test of Equality of Variance was used to test equality of the variances. The authors in Green and Salkind (2005) demonstrated that if the Levene's Test of Equality of Variance is not significant (p>.05), the two variances are approximately equal. Table 4.2 shows the result of Levene's Test of Equality of Variance.

Table 4.2

Levene's Test of Equality of Error Variances of Experimental and Control Groups on

the Post Tests on the Dependent Variables

Dependent variable	Levene's Test	Df1	Df2	Sig.
Forehand skill	.022	2	87	.978
Backhand skill	.094	2	87	.911

From table 4.2, all the p values of dependent variables were greater than .05. Therefore, it was concluded that the variances of Forehand basic skill test and Backhand basic skill test were approximately equal and there was homogeneity of variances of the dependent variables across groups.

4.6 Assumption of Homogeneity of Regression Slopes

The assumption of homogeneity and regression is considered the most important assumption. It indicates that the relationship between the independent variable and the covariate is the same for all factors (Leech & Barrett, 2011). If the results were statistically significant, the assumption is not considered violated. However, if this assumption is violated, this indicates that the relationship between the dependent variable and the factors cannot be interpreted because the interpretation will be changed when the value of the covariate changes. The procedure of assessing homogeneity of the regression slops is conducted for the forehand and backhand tennis basic skills test.

Table 4.3

The Interaction between the Independent Variable (Group) and the Covariate (tennis basic skills pre-test)

Groups	Df	Mean	F	Sig.
Group*forehand pretest	2	17.059	2.725	.071
Group*backhand pretest	2	2.891	29.336	.649

The output from Table 4.3 showed that the significance value of the interaction between the independent variable (blocked, random practice & traditional practice) and covariate (tennis forehand skill) is .071. It was more than .05. Thus, the assumption was not violated. According to , if the significance level of the interaction is more than .05, the interaction is not significant; thus, there is no violation for homogeneity of regression slopes as the authors prescribed. (Leech & Barrett, 2011). As shown in Table 4.3, the significance value of the interaction is .649. It was more than .05. Thus, the assumption was not violated. According to (Pallant 2010) if the significance level of the interaction is more than .05, the interaction between the independent variable (blocked, random & traditional practice) and covariate (tennis backhand skill) is not significant; thus, there is no violation for homogeneity of regression slopes as the authors prescribed (Leech & Barrett, 2011).

4.7 The Effect of Blocked and Random Practice on Tennis Forehand Skill.

Question1. Is there a statistical significant effect of blocked practice on tennis forehand skill?

Question2. Is there a statistical significant effect of random practice on tennis forehand skill?

Question3. Is there a statistical significant difference between blocked practice, random practice and traditional practice on tennis forehand skill?

Hypothese1. There is no significant effect of blocked practice on tennis forehand skill.

Hypothese2. There is no significant effect of random practice on tennis forehand skill.

Hypothese3. There is no significant difference between blocked practice, random practice and traditional practice on tennis forehand skill.

An analysis of covariance was used to access whether the experimental groups has higher score in learning tennis forehand skill by using blocked & random practice than the control group after controlling for differences between the experimental groups and control group in learning tennis basic skills.

Table 4.4

Analysis of Covariance for Learning tennis forehand skill as a Function of Group, Using Pre-test Scores on Learning forehand Skill test as a Covariate

Source	Type III sum of All squares	Df	Mean square	F	Sig.	Partial Eta Squared
Corrected Model	835.479ᵃ	3	278.493	42.775	.000	.599
Intercept	1325.987	1	1325.987	203.666	.000	.703
Forehand Pre-test	275.390	1	275.390	42.299	.000	.330
Group	470.358	2	235.179	36.123	.000	.457
Error	559.910	86	6.511			
Total	70009.000	90				
Corrected total	1395.389	89				

 With reference to Table 4.4, since the significance value for the experimental groups is .000, which is less than .05, there was a significant difference between the experimental groups and control on learning tennis forehand skills by using random, blocked & traditional practice, [F (2.81) = 36.123, p< .05], partial eta squared = .457.

90

The partial eta squared value of .457 means that 45.7% of the variance in learning tennis forehand skills by using blocked, random & traditional style attributed to type of practice in teaching approach. According to Cohen (1988) the value of eta ranging from .1 to .3 is regarded as small, those of .3 to .5 as a medium, and those .5 and over as large. Thus, the value of eta for the forehand skill test (eta = .457) is considered as a medium effect size.

Groups that are using blocked and random practice in the teaching approach have more opportunities to learn faster and within short learning time. They could communicate and question freely in the classroom. That's indeed shows the effect of practice scheduling (blocked & random) approach on learning tennis forehand skill. Thus, the null hypotheses were accepted. There is a statistical significant effect of practice scheduling for both random and blocked practice on learning tennis forehand skill.

A Multiple Comparisons (Post Hoc Test, scheffe) was used to assess whether students in the experimental groups have a higher difference in learning tennis forehand skill in post-test than pre-test.

Table 4.5

Multiple Comparisons between Three Groups on Forehand Basic Skill

Groups	EG1 (blocked)	EG2 (random)	CG (traditional)
EG1 (blocked)	-	2.400*	3.667*
EG2 (random)	-	-	6.067*

As showing from the table 4.5 that, the results indicated there is a significant effect for blocked practice (experimental group one) on tennis forehand skill, the blocked

practice (experimental group one) significantly different =3.667 than the traditional practice (control group); while the results indicated there is a significant effect for random practice (experimental group two) on tennis forehand skill, the random practice (experimental group two) significantly different = 6.067 than the traditional practice (control group).

Lastly, the results show also there is a significant effect for random practice (experimental group two) on tennis forehand skill than the blocked practice (experimental group tone), random practice (experimental group two) significantly different = 2.400 than the blocked practice (experimental group one).

Table 4.6

Adjusted and Unadjusted Group Means and Variability for tennis forehand Skill, Using Pre-test Scores as Covariate

Source	N	Adjusted (after)		Unadjusted (before)	
		Mean	Std. Error	Mean	Std. deviation
CG	30	24.668[a]	.468	24.37	3.178
EG1	30	27.882[a]	.466	28.03	3.113
EG2	30	30.282[a]	.466	28.03	3.002

Table 4.6 presents the means and standard deviations for the experimental groups and control group on learning tennis forehand skill by using blocked, random and traditional practice, before and after controlling for the pre-test effect. As evident from this table, a difference existed between the experimental groups and control group on learning tennis forehand skill by using blocked, random and traditional practice post-test, before and after controlling for tennis forehand skill pre-test effect. In general, ANCOVA analysis revealed that the experimental group one (blocked practice) and

92

experimental group two (random practice) students (M = 28.03, SD = 3.113) and (M = 28.03, SD = 3.002) respectively scored significantly higher than the control group students (M = 24.37, SD = 3.178).

4.8   The Effect of Blocked and Random Practice on Tennis Backhand Skill.

Question 4. Is there a statistical significant effect of blocked practice on tennis backhand skill?

Question 5. Is there a statistical significant effect of random practice on tennis backhand skill?

Question 6. Is there a statistical significant difference between blocked practice, random practice and traditional practice on tennis backhand skill?

Hypotheses 4. There is no significant effect of blocked practice on tennis backhand skill.

Hypotheses 5. There is no significant effect of random practice on tennis backhand skill.

Hypotheses 6. There is no significant difference between blocked practices, random practice traditional practice on tennis backhand skill.

An analysis of covariance was used to access whether the experimental groups has higher score in learning tennis basic skill (backhand) by using learning styles blocked, random & traditional practice than the control group after controlling for differences between the experimental groups and control group in learning tennis basic skills.

Table 4.7

Analysis of Covariance for Learning tennis basic skills as a Function of Group, Using

Pre-test Scores on Learning tennis basic skill (backhand) Test as a Covariate

Source	Type III sum of All squares	Df	Mean square	F	Sig.	Partial Eta Squared
Corrected Model	578.917[a]	3	192.972	29.352	.000	.506
Intercept	1350.407	1	1350.407	205.401	.000	.705
Forehand Pre-test	193.561	1	193.561	29.441	.000	.255
Group	366.003	2	183.002	27.835	.000	.393
Error	565.405	86	6.574			
Total	68987.000	90				
Corrected total	1144.322	89				

Referring to Table 4.7, since the significance value for the experimental groups is .000, which is less than .05, there was a significant difference between the experimental groups and control on learning tennis backhand skills by using blocked, random & traditional style, $[F_{(2.81)} = 27.835, p < .05]$, partial eta squared = .393. The partial eta squared value of .393 means that 39.3% of the variance in learning tennis backhand skills by using blocked, random & traditional practice attributed to learning styles in teaching approach. According to Cohen (1988) the value of eta ranging from .1 to .3 is regarded as small, those of .3 to .5 as a medium, and those .5 and over as large. Thus, the value of eta for the tennis backhand skill test (eta = .393) in this study is considered as a medium effect size. Students under (a blocked and random practice) in the teaching approach shows more effect in learning tennis backhand skills. Type of practice suggest that individuals demonstrate their competence to others. When students took their enough time for the learning process, since the results obtained

94

might vary for each individual, students experienced were more interested in learning tennis backhand skill by type of practice in teaching approach. Thus, the null hypotheses were accepted. There is a statistical significant effect of blocked practice on tennis backhand skill and there is a statistical significant effect of random practice on tennis backhand skill.

A Multiple Comparisons (Post Hoc Test, scheffe) was used to assess whether students in the experimental groups have a higher difference in learning tennis backhand skill in post-test than pre-test.

Table 4.8

Multiple Comparisons between Three Groups on Tennis Backhand Basic Skill

Group	EG1 (blocked)	EG2 (random)	CG (traditional)
EG1 (blocked)	-	2.000*	3.033*
EG2 (random)	-	-	5.033*

With reference to table 4.8, A Multiple Comparisons was conducted to evaluate the effectiveness of blocked and random practice on tennis backhand skill. There is a significant effect for blocked practice (experimental group one) on tennis backhand skill, the blocked practice (experimental group one) significantly different = 3.033 than the traditional practice (control group); while the results indicated there is a significant effect for random practice (experimental group two) on tennis backhand skill, the random practice (experimental group two) significantly different = 5.033 than the traditional practice (control group). Finally, the results indicated that also there is a significant effect for blocked practice (experimental group two) on tennis backhand skill than the blocked practice (experimental group one), random practice

95

(experimental group two) significantly different = 2.000 than the blocked practice (experimental one).

Table 4.9

Adjusted and Unadjusted Group Means and Variability for Tennis Backhand Basic Skill, Using Pre-test Scores as Covariate

Source	N	Adjusted (after)		Unadjusted (before)	
		Mean	Std. Error	Mean	Std. deviation
CG	30	24.834[a]	.468	24.77	2.750
EG1	30	27.790[a]	.468	27.80	2.987
EG2	30	29.743[a]	.468	29.80	3.112

As evident from the table 4.9, a difference existed between the experimental groups and control group on learning tennis backhand skill by using blocked, random and traditional practice, before and after controlling for the pre-test effect. In general, ANCOVA analysis revealed that students in the experimental group one (blocked practice) and experimental group two (random practice) students (M = 27.80, SD = 2.987) & (M = 29.80, SD = 3.112) respectively scored significantly higher than the control group students (M = 24.77, SD = 2.750).

4.9   Summary

All the hypotheses were accepted. Blocked and random practice showed a greater impact on students' in learning tennis basic skills (forehand & backhand). Students taught with blocked and random practice scored significantly higher than students undergoing the traditional teaching approach in these aspects. In addition, students were found to have large improvement in learning tennis basic skills (forehand & backhand) under the effect of blocked and random practice.

CHAPTER 5 DISCUSSION AND CONCLUSION

5.1 Introduction

In this study, the main objective was identifying the impact of the blocked practice and the random practice on the basic tennis skills which are the forehand and backhand skills. Recent studies have reported that the type of practice (practice scheduling), contributed significantly to the performance of the students. Hence, the researcher carried out this study and observed that the practice scheduling approach could not only improve the student performance while learning the tennis skills but could also change their learning level and encourage them to be more mature and mastery-oriented during their learning process.

This chapter contains three different sections. Section 1 elaborates the research question along with appropriate references with regards to the observations of the study. Thereafter, the researcher made some observations and discussed the implications of the study. Finally, the researcher has mentioned some suggestion for carrying out further research.

5.2 Discussion

In our study, the researcher applied the quasi-experimental design, wherein the students in three different classrooms were used as 3 different study groups, as the university timings and days were fixed in the university's timetable. Hence, the subjects were selected based on the convenience sampling, wherein the students in the classroom represented the 3 different groups, i.e., 1 control and 2 experimental. The students in every class represented their class as the control and the experimental group. Our study was carried out after one month of the classes starting, due to the roles played by the students.

Each group contained of (30) subjects and the classes held at the university's tennis courts during their tennis classes which started on Monday between 10:00 am to 11:30 am. Each session included three different sections which are the preparation section, the main section and the final section. The preparation section was divided into two parts which are the general warm-up and the specific warm-up. The general warm-up is the type of warm-up the conducted for any class regardless the type of sport they are practicing and it contained of jogging, stretching and footwork exercises and lasted roughly for (10) minutes.

The second part of the preparation section was the specific warm-up which is the type of warm-up that help the students to prepare for a specific sport and targeted specifically the muscles that the students needed in order to conduct the tennis skills which is lasted for (10) minutes as well. It involved wrist, elbow and shoulder dynamic stretching and rotation, rope skipping to prepare the legs muscles for a higher frequency movement and three different types of planks to help with the body core activation.

The main section on the other hand contains of two sections as well, theoretical, which lasts for (20) minutes and it generally involves explaining the skill by the lecturer or the role model to the student by covering all the major parts required to achieve any tennis basic skills. The second part of the main section is the practical part. This specific part is where all the groups differ from each other.

For the controlled group, the practical part involved practicing each skill separately, by having three to four different exercises for each skill in no specific order (scheduling). And the lecturer will try to involve different skills each day until the end of the program.

For the first experimental group which is using the blocked practice the main section also contains of two parts practical and theoretical part. However, the main

focus of the two experimental groups is the practical part as the theoretical part shouldn't last more than 5 minutes in total and it depends on how complicated the exercise that the students are conducting. For this group, the students are not allowed to have a wider variety of exercises and the main objective is to conduct as many repetitions as possible for one skill at a time before moving to the next skill, hence the word blocked.

For the second experimental group (random practice), the main section continues a wide variety of exercises and the nature of these exercises are different from the first experimental group. In this group the student are not allowed to conduct any skill more than two times before moving to the next skill and so on. The idea is to make sure that there is no repetition for any skill and the approach is the transition among many skills during each exercise and the goal is to randomly conduct these exercise.

Before carrying out any form of treatment, the pre-test data of the control and the experimental groups was analysed with the help of ANCOVA for determining their learning levels. Based on the statistical analysis results, it was seen that there was no significant difference in the pre-test mean scores for the three groups studied. All major observations and findings have been summarised and discussed below.

5.3   The Effect of Blocked Practice on Tennis Forehand Skill.

Findings from the current study as shown in Table 4.4 from the tests of between students effects analysis there was a significant difference between the experimental groups and control group with a medium effect size in the mean of the post-test score on learning tennis forehand skill by using blocked practice & traditional practice. As shown in Table 4.6 that students with blocked practice scored better than students with traditional practice in learning tennis forehand skill As shown that the mean score for the experimental group is higher than the control group that can conclude the learning

99

of tennis forehand skill was improved for the experimental group over than the control group after treatment by using blocked practice on learning tennis forehand skill. This means that blocked practice is more beneficial than traditional practice for university students learning tennis forehand skill. In answering the research question, there was a statistically significant effect on the learning tennis forehand skill towards the subjects after using blocked practice intervention program for university students. The research findings illustration that the tennis forehand skill that had been carried out for 12 weeks on university of Baghdad students increase the level and quality of learning tennis forehand skill for the class students by using blocked practice.

The study of Ali (2012) "Effect of variety of types of performance in blocked and random practice styles on depth for forehand and backhand in Tennis" The observations from the earlier studies revealed that these type of practices were more preferred than the conventional practice (traditional), as they could lead to a very effective academic performance as compared to the conventional methods. The blocked practice referred to the highly repetition of the skill. Similar results have been reported from our study, thus indicating that the students who were taught by using the blocked practice showed better results in comparison to the students who were taught using conventional methods. Furthermore, these results were validated based on earlier studies.

Blocked practice is when the learner performs a single skill over and over without interruption. The previous studies showed that the blocked practice has a higher rate of acquisition and retention than the traditional practice with repetition being the key.

According to Zipp and Gentile (2010) the blocked practice scheduling is considered the variation of the task that is practiced during many trials before changing to an other task of variation. This method is an exercise method that

100

concentrate on only one of the aspects of a skill. Due to the high repetition in this form of practice, the student will have the ability to adapt and correct to the new skill that is learnt (Edward, 2011). While lack of conducting blocked practice is a temporary performance that makes the learner more dependent on the exercise context. This will lead to difficulties in the process of adapting to a new skill context (Magil & Anderson, 2011).

5.4 The Effect of Random Practice on Tennis Forehand Skill.

Based on the results of current study, as seen in Table 4.4 from the tests of between students effects analysis there was a significant difference between the experimental groups and control group with a medium effect size in the mean of the post-test score on learning tennis basic skills by using blocked, random and traditional practice. While, the researcher has observed in Table 4.6 that the students who were taught the random practice showed a better score than the students who were taught the basic tennis forehand skill using the traditional practice. As shown that the mean score for the experimental group is higher than the control group that can conclude the learning of tennis forehand skill was improved for the experimental group over than the control group after treatment by using random practice on learning tennis forehand skill.

Design and reached to the conclusion that the methods of practice (random and blocked practice) has a positive effect on learning and retaining forehand and backhand and serve in tennis. This study showed that there is a significant difference in means scores of the experimental group which used random practice over the group that used traditional practice in the controlled group. The random practice scheduling in motor learning conducted on different skills that are combined with each other. The random working patterns and trials and not conducted on one skill more than few trials before shifting to the next skill while each of the trials interleaved on the previous trial (Belger, 2013). The random method of practice where the engeneering sequence must

101

be changed and should be unpredictable and envloves more than one technical aspect during a single practice session. The main advantages of the random practice is enabling the learner to distinguish and compare different types of skills or different aspects of one skill in order to enable the memory more distinctive and meaningful for each skill. However, the lack of the random practice makes it more difficult to the learner because of making him taking longer period of time to adapt and respond to the aspect of the skill (Edward, 2011).

5.5   The Difference between Blocked and Random practice while Learning Tennis Forehand Skill.

The research findings In comparison to the traditional learning style as showed in table 4.5 the students who were taught tennis forehand skill using the different practice scheduling (blocked and random) showed a better score than the student who were in the traditional practice group, wherein the students who were taught using the random practice had a significantly better score compared to the students who were taught using the blocked practice.

There have been several studies published regarding the effectiveness of applying different type of practice (blocked and random) while learning the basic tennis skills and other sports curricula in schools and universities. In one such study, Rashid and Abdulqadir (2012) (The impact of using practice scheduling in learning some basic offensive skills in mini basketball). The researcher concluded that the type of practice scheduling showed a significant effect on the basic offensive skills than the traditional practice. However, the group that used random practice has a higher mean scores in the post-test for all three selected skills which are dribbling, passing and shooting.

Another study was conducted by A study was conducted by Muhaibes (2012) titled the effect of random and blocked program based to improve coordination in smash and block for junior volleyball players.

The subjects were 18 junior players and used experimental design for it more suitable for the nature of the study and the results showed that the methods used in this research showed a positive impact in the coordination of the two mentioned skills, the results was not steady and has a fluctuation, and finally the random practice showed more positive effect than the blocked practice in learning and retaining the skill. In this study the researcher has seen that the student in the second experimental group (random practice) has a higher ability in connecting the part of a single skill and conducting different skills during the practice and the posttest. The students in the first experimental group showed more consistency conducting one skill at a time and struggled in moving from one skill to the other and required more time and a higher number of trial to start striking the ball in the court. As the posttest required transitioning faster in between skills, logically the random practice group student achieved the task easier. Furthermore, due to the complicity of the tennis basic skills whether it's a forehand or a backhand random type of scheduling is more suitable.

In other words and according to the schema theory by Schmidt's theory (1975), (1988) to compare with, the blocked practice scheduling is not supported by the schema theory formation. In other words, the schema theory suggest that the variability of the practice forces the student to always be able to parametrize that motor program and allow him to build an effective rules of parameterization. Moreover, the repetition of the same movement will only be allowing the reinforcement of that specific motor program. In that context, the students won't be able to adapt the changing conditions. The subject will learn faster while imposing blocked practice for only one skill at a time but will have a problem retaining the skill.

On the other hand, randomly scheduled practices will have a better retaining ratio due to the subject's ability to adapt to the different skills that imposed.

5.6   The Effect of Blocked Practice on Tennis Backhand Skill.

Findings from the current study as illustration in Table 4.7 from the tests of between students' effects analysis there was a significant difference between the experimental groups and control on learning tennis backhand skill by using blocked, random & traditional practice, with a medium effect size in the mean of the post-test score on learning tennis backhand skill by using blocked, random & traditional practice. As shown in Table 4.9 that students with blocked practice scored better than students with traditional practice in learning tennis backhand skill.

As shown that the mean score for the experimental group is higher than the control group that can conclude the learning of tennis basic skill was improved for the experimental group over than the control group after treatment by using blocked practice in learning tennis backhand skill for the class students by using blocked practice. That shows that the blocked practice works better than the traditional practice in learning tennis backhand skill for university students after twelve weeks of practicing similar exercises with a different scheduling for each exercise.

For each practice session for the first experimental group the students were not allowed to conduct more than one skill. This mean that for each different skill, the students had the time to conduct as many repetitions as possible without any distractions or connecting with other skill. This also involved extra feedback and instant correction by the lecturer to avoid negative interference.

Previous studies showed the effect of blocked practice (low interference) scheduling as compared to a non-scheduled practice programs. The study of Abbas (2013) Effectiveness of practice scheduling random & blocked in learning ground strokes in tennis. The importance of this study comes to understand the effect of

practice scheduling on ground strokes in tennis as the traditional method wasn't as effective and the students showed a lack of good performing as well as lower grades in tasting not to mention that the majority of students was never exposed for tennis skills before practicing it in the university.

The researcher used the experimental design, as it is more suitable to the nature of the study. The samples were 75 students who divided into three groups two of them were experimental. The researcher concluded after the pre and posttests that experimental groups showed higher rate of learning especially the first experimental group who used the blocked practice while the group who used the random practice showed a higher rate of retaining the skill. The researcher recommended using practice scheduling as a part of the curriculum and try as much as possible to avoid the traditional style.

Schmidt (2011) suggests that in any blocked practice scheduling, the goal and the task are similar during every attempt. The subjects will be using the same solution that was generated in the first trial while the subjects performing the next trial. This means that the block practice will reduce the subject ability and need to solve any problem during each trial and the need to come up with new and different decisions required during a simple round of a trial. This could be applied to higher number of subjects endeavors. The whole idea is to make the subjects capable of generating more suitable patterns given that the nuances of a particular task at the hand is more imperative for long term skills improvement that is followed by more adaptable and flexible motor requirement during the competition.

5.7   The Effect of Random Practice on Tennis Backhand Skill.

Findings from the current study as illustration in Table 4.7 from the tests of between students effects analysis there was a significant difference between the experimental groups and control on learning tennis backhand skill by using blocked, random &

traditional practice, a medium effect size in the mean score of the post-test score on learning tennis backhand skill by using block, random and traditional practice. As shown in Table 4.9 that students with random practice scored better than students with traditional practice with a standard deviation in learning tennis backhand skill. As shown that the mean score for the experimental group is higher than the control group that can conclude the learning of the tennis backhand skill was improved for the experimental group over the control group after treatment by using blocked practice on learning the backhand skill.

This shows that the random practice work is more beneficial than traditional practice for university students learning tennis backhand skill. In answering the research question, there was a statistically significant effect on the learning tennis backhand skill towards the subjects after using random practice intervention program for university students.

The majority of previous studies confirms such a result as the subject in these studies tends to have a higher rate of learning the skills and retaining them during the post-test.

In a study of Ismael and Tahseen (2010) "Effect of Using random and blocked, constant and various practice schedule on learning some skills in tennis for beginners". The goals of the study were to know about the effect of practice schedule (random vs. blocked, constant vs. various) on learning some skills tennis. The study investigates about the effect on motor program planned and transfer of learning. The subjects in this study 48 students enrolled at Sulaymamia Collage, They divided into four groups.

The first group was practice on random, second one on blocked, third one on traditional and finally: on various practice. The results revealed that a significant

effect due to practices on four kinds of drills, the best one was the random practice, behind it the various practice on learning some skills in tennis.

Shea and Zimny (1983) discussed that the change of any task during any random practice trial will make the task more distinct from each other and have more meaning to it. This will result in more elaborate memory representations. As it was revealed in the subject's interviews after the pre-test, the subjects in random practice had the tendency to connect the task structure to already learned materials.

Until this point, it was proven that random scheduling of the practice enhance the transfer of the motor skill at the retention phase while conducting the transfer test by using the arm movement in a segment task. It can also be generalized to other fields the operational logics Carlson and Yaure (1990) and many vocabularies of different foreign languages (Scheneider, Healy & Bourn, 2002). It can also be generalized to other aspects such as handwriting (Ste Marie, Clark, Findlay & Latimer, 2004)

Shea and Morgan (1979) found that random practice scheduling can facilitate the retention. The random practice scheduling can cause an increase in the contextual interference during the learning. The increase in the contextual interference can make the learning more difficult but can also results in more flexible action plan Magill and Hall (1990) or stronger traces in memory for the action plan (lee, 1997). This can facilitate the retention performance. With complex skills such as backhand and forehand in tennis, random practice is more desirable to retain such a skill especially when there is more than one complex skill.

5.8   The Difference between Blocked and Random Practice on Learning Tennis Backhand Skill.

The research findings In comparison to the traditional learning style as showed in table 4.7 the students who were taught tennis backhand skill using the different practice scheduling (blocked and random) showed a higher score than the traditional

practice however, random practice group showed a higher score than the blocked practice group. Numerous studies were conducted for investigating the effect of applying the practice scheduling (blocked and random) in teaching the basic tennis skills and other sport-based curricula in the university students.

According to Meira (2002), in her study asked the subjects to perform the throwing the dart task to a selected target by using different patterns of grips. Because of the contextual interference, there was few differences while the transfer of trials was occurring. So studies explained that the random practice can be more useful during the transfer whereas other studies showed it did not. The other purpose of this study was to measure if the effect of the contextual interference could be higher in the number of trials increased during the transfer tests. During the practice, new aspect was added to the task of dart throwing using different hand grips which was changing the throwing location. Each student conducted 80 trials in both conditions of random and blocked practice conditions. The students that performed the blocked practice conditions on the dart throwing who used one hand grip from a single location for a certain number of trials before shifting to the next location. While the students in the random group conducted each throw from a different location in a more random order for all of the 80 trials.

The transfer tests that used a different grips or different type of throwing included forty trials that was given ten minutes after the last learning trial. The result of the study showed on the transfer test that the random group had a better performance than the first trials to the last block of trials.

Porter (2005) in his study had the subjects performing a golf putting task to a target from 3 different locations. Depending on where the ball stopped in the target area, the points was given. The subjects had to complete 81 trials and the blocked group performed 27 putting from a single location before shifting to a new location. The

groups that used random practice scheduling had to perform all of the 81 trials randomly. The first 27 putting that the group had to practice in a blocked schedule or the nine trials from a single location was finished before shifting to the next. The second 27 trials were practiced in order, meaning the students practiced the trials from a three different location in the same manner for 27 trials. The last 27 trials were randomly assigned. The results showed that the student who practiced with increased interference showed a better performance than the students in the blocked group during the retention conditions.

Many researchers have argued that practice scheduling may not be exclusively mutual and they share a common denominator (Rudisill, 1993). This denominator might be the enhanced cognitive activity or the decreased process that is resulting from the blocked schedule. Meaning, practice scheduling that is in need for more processing effort for example random schedule are showed to be more predicted of being effective for the motor learning than the practice schedule that is required less cognitive effort such as blocked practice schedule (Sherwood & Lee, 2003).

According to both of these elaborations and reconstruction hypotheses, the random schedule does need more cognitive activity. However, the first hypotheses explain that increase by the subject's engagement in inter-task elaborative process. However, the second one depends on the assumptions that the subjects have to reconstruct the action plan after each trial. Keller, Lee, Weiss and Relyea (2006) considered that both viewpoints shows an important role for the executive control process.

On the other hand, Lee and Schimdt (2014) confirmed that practice scheduling effect depends on the complexity of the task practiced, simpler tasks can be more positively increased by blocked scheduling which contains high repetitive program and could decrease by random scheduling. While complex motor skills such as

shooting and dribbling in basketball, triple jump in track and field and tennis skills for this manner that requires a high contextual interference will increase in learning and retaining.

5.9   Implications of the Study

This study is very important as it presents substantial evidence regarding the fact that practice scheduling can significantly and positively affect the educational level of university students (collage of physical education). This is more prominent amongst the student's type of practice (blocked & random) as it decreases the difficulties of learning a more complex skill which are the forehand and backhand in this case. These results could help the stakeholders draw specific implications, and also help the teachers and the students become more aware of the effects.

5.10   Implications for the Teachers

The researcher, as educators, must understand the complexity of the tasks conducted by the students and how practice scheduling can influence the process of learning for the students to achieve a higher scores in such skills. Furthermore, even we could be responsible for their poor performance as the approach for teaching different skills should be different as well. In this study, the researcher has presented a clear image to the educators with regards to the effect of different type of practice on the performance of the students. Our results showed that the students performed better when practice scheduling (i.e., blocked and random) were used and hence, the teachers had to modify their technique, approach and their learning strategies.

As educators teaching physical education, we must emphasise on our students' understanding instead of surface learning only. The teachers must promote the usage of practice scheduling for improving the students' interest, learning and performance. Moreover, the practice scheduling provides a right track for the development of the learning level of the students. While teaching the students different practice methods,

they can slowly realise that these methods help them learn new tasks and skills faster as the blocked practice provides them with more repetitions during a longer periods of time to provide higher acquisition with less interference (distractions) for each skills. Also, using the random practice, can provide the students to connect the parts of any complex skill or executing several different skills during shorter periods of time by enforcing these differences in the long term memory to insure less mistakes. Applying different practice scheduling could accelerate learning the skill in the early stages of learning which could motivate the students as it provides the sense of achievement which eventually increases the will of the student to be part of the process.

5.11   Implications for the Students

Each student has a different learning ability and different understanding for simple and complex skills. Practice scheduling could help them to have a better understanding and clearer image on how the skills are learned and how muscle memory works. It increases the student's chance to learn how to connect these skills and make them less complicated if the learn it the correct way. Moreover, practice scheduling whether it is blocked and random would provide the student with a map to follow which help the student to see these types of skills easier to learn and less complicated. As the students who follows the blocked practice would understand the benefits of low interference with high repletion and it influence on accelerating their process of leaning. While the students who followed the random practice will understand the benefit of high interference among different skills and how it could influence the retention of such a skill which eventually will appear less complicated for them.

5.12   Recommendations for Further Research

The findings presented in our study provide specific insights into the effects of applying the blocked and random practice on the learning of the basic skills in tennis. Therefore, this researcher has presented some recommendations for carrying out further research. This would help in making the findings complete and reliable in order to support the efficiency of the blocked and random practice in the learning of the basic tennis skills.

1- Here, we taught the students the practice scheduling (blocked and random) for a period of 12 weeks for determining its effectiveness on their learning of basic tennis skills which are forehand and backhand. The experiments were carried out twice a week for the duration of 90 minutes in university of Baghdad collage of physical education level three students. Based on the results of the study, the researcher noted an effect of the modern practice scheduling on the learning of the basic tennis skills. If the teaching of the practice scheduling (blocked &random) was not conducted for 12 consecutive weeks, there was a decline in the learning of the basic tennis skills.

2- The study consisted of 90 male students, and the researcher selected 3 classes from the collage of physical education. Further studies could be carried out using more students from different areas, like the urban or rural regions, different age groups, skill level and different sex for generalising the findings of the study.

3- In our study, the researcher held the physical education classes twice every week for the duration of 90 minutes. Further studies can be conducted for investigating the effect of the blocked practice and the random practice for a physical education class of 60 or 120-minute duration, held once or three times a week for determining if there was a significant difference in the learning of the basic tennis skills.

4- In our study, only male students were investigated. Further research can be carried out based on the performance of female students for determining if a similar effect of

the blocked practice and the random practice is seen on the learning of the basic tennis skills.

5- In this study, research was carried out on 21-23 years old university students. More research can be conducted on older or younger students for determining if the effects of applying the blocked and random practice are same for students of a different age group.

6- Our study carried out a research for the physical education tennis lesson using blocked and random practice in the learning of the basic tennis skills. More research can be carried out using different practice scheduling method or learning style from our study, for determining if there was any difference in the learning of basic tennis skills.

5.13   Contribution of the Study

This research contributes to the fact that how the early learning stages could be better scheduled by the lecturer, teachers or even coaches. The analyses of this research further add to the current studies by identifying the importance of practice scheduling (blocked and random) in improving the basic skills and its effect on the related learning process. This research confirms the findings of previous researches that also emphasised on the relevance of practice scheduling in improving motor learning. Blocked and random practice was found to strengthen basic skills contextual interference between the same or different skills.

Furthermore, this research enhances the existing concept through application, validation and extension of newer theoretical scheme for managing the earlier steps of motor learning in educational settings this investigation has also extended its coverage to coaches and athletes. Toward strengthening its findings, this research considered various contextual factors including the educational environment.

5.14   Conclusions

In conclusion, in our study, the researcher has investigated the manner in which the practice scheduling (blocked and random) have influenced the basic tennis skills. The study was carried out for 90 collage of physical education students in Iraq. The researcher used different practice scheduling like the modern and the traditional practice during the teaching-learning sessions. The experimental group comprised of students who were taught using the blocked and random practice, while the control group contained students who were taught using the traditional practice. Results obtained from the study suggested that the practice scheduling (i.e., blocked and random) had a very positive effect on the learning of the basic tennis skills. Nevertheless, further research has to be carried out on a different age group sample and using different practice methods and techniques, based on this study, for obtaining a better and significant outcome.

References

Colley, A.M., & Breech, J.R. (2004). *Cognition and action in skilled behaviour*: Act controversy. New York: Elsevier.

Barreiros, J., Figueiredo. T., & Godinho. M. (2007). *The contextual interference effect unapplied settings.* European Physical Education Review.

Battig, W. (1966). *Facilitation and interference*. In E. A1 Bilodea (Ed.), *Acquisition of Skill.* New York: Academic Press1.

Battig, W. (1979). *The flexibility of human memory*: UK. The British Library.UK

Battig, W. (1972). *Intratask interference as a source of facilitation in transfer and retention.* In R.F. Thompson & J.F. Voss (Eds.), Topics in learning and performance New York. Academic Press.

Brady, F. (1998). *A theoretical and empirical review of the contextual interference effect and the learning of motor skills.* Quest. L.A.

Creswell, J.W. (2012). *Educational research: planning*: Conducting and evaluating quantitative and qualitative research. (4th ed). Pearson publisher.

Dafir, I., & Tahseen, T. (2013). *Effect of Using Random and Blocked, constant and various practice schedule on learning some skills in tennis for beginners.* Iraq. Baghdad.

Davis, G. (1988). *The effect of contextual and retroactive interference on the retention of a motor skill*: Unpublished doctoral dissertation. Pennsylvania State University. University Park.

Eman, N., & Luai, H. (2015). *The effect Of Using Three Teaching Styles On the level of badminton learning ability.* Baghdad.

Gabriele, T.E., Hall. C.R., & Lee, T.D. (1989). *Cognition in motor learning: Imagery effects on contextual interference*: Human Movement Science. CA. 8, 227. 245.

Hany, J. (2011). *The impact of capacitor and various practice in skill performance in handball for the students of collage of physical education in the University of Dyala.* Iraq. Dyala.

Hensley, L. D. (2013). *Characteristics of selected tennis skill tests:* Abstract of research paper.

Hewitt, J. E. (2011). *Hewitt's tennis achievement test: Research quarterly*.

Hussain, A. R. (2011). *Motor learning and practice scheduling.* The National Library. Baghdad.

Ismael, A, & Tahseen, H. (2010). *The effect of practice scheduling in different timings and its effect on learning tennis open skills for college students.* Baghdad.

Ismael, R., & Omar, A. Q. (2012). *The Impact of Using the Style of practice Scheduling (Practice) Static Distributed in Learning Some Basic Offensive Skills in Mini Basketball.* Baghdad. Dar El Elm.

Keller, G.J., Li, Y., Weiss, L.W., & Relyea, G.E. (2006). *Contextual interference effect on acquisition and retention of pistol-shooting skills*: Perceptual and Motor Skills.

Khalid, H. A. (2013). *Effectiveness of practice scheduling random & blocked in learning ground-strokes in tennis.* Dar El Nasher. Baghdad.

Lee, T. D., & Schmidt, R. A. (2008). *Motor learning and memory:* Roediger, III (Ed), Cognitive psychology of memory. CA.

Limons. E., & Shea. J. (1988). *Deficient processing in learning and performance.* In.

Magill, R., & Hall, K. (1990). *A review of the contextual interference effect in motor skill acquisition. Human Movement Science.*

Meeuwsen, H., & Magill, R. (1991). *Spacing of repetitions versus contextual interference effect in motor skill learning*: Journal of Human Movement.

Mohamed, O. (1987*). Motor learning and physical training*. 1ˢᵗ edition. Al-Kuwait. Dar al-elm. Baghdad.

Mohammed, H. H. (2007). *The effect of different learning methods in learning and retaining forehand, backhand and serve in tennis for students.* University of Baghdad.

Mosston, M. (1981). *Teaching physical education*, Ohio Charles E. Merrill publishing company.

Nahida, A. Z. (2011). *The effect of interference of styles of practice on learning and improving the level of serves and smash in volleyball.* University of Baghdad library.

Nazar, T., & Kamel, L. (2010). *Sport psychology*, Baghdad, Al-Hikma publish house.

Pat, C. (2014). *The six basic tennis strokes. A blog at www.patcash.com.uk.*

Pot, C. (1988). *How forgetting facilitates remembering*: *An analysis of the contextual interference effect in motor learning*. Unpublished doctoral dissertation. Louisiana State University. Baton Rouge. LA. US.

Qassim, L. (2012). *Subjects in motor learning*. Baghdad. Dar Al-Buraq for printing and Publishing. Iraq. Baghdad.

Qusai, S.A., & Fatima. A. (2012). *The effect of random and blocked practice in improving shooting skills for junior Football players.* Mashhad. Iran.

Ridha, A. (2012). *Effect of variety of types of performance in blocked and random practice styles on depth for forehand and backhand in Tennis.* The American university in Erbil. Kurdistan.

Saad, M. (2012). *The Impact of Using the Style of practice Scheduling (Practice) Static Distributed in Learning Some Basic Offensive Skills in Mini Basketball.* University of Dyala. Iraq.

Safaa, A., & Hassan, A. (2010). *The effect of intensive and distributive learning style on improving the performance and transfer of learning in some tennis and badminton skills.* Mosul. Iraq.

Salam, A., & Hady, S. (2013). *Effect of both peer tutoring style and the triple reciprocal style in acquisition of Technique for some tennis basic skills.* Iraq.

Schmidt, R. (1975). *A schema theory of discrete motor skill learning.* Psychological Review. California. US.

Schmidt, R. (1988). *Motor control and learning*: A behavioural emphasis. Champaign. IL. Human Kinetics.

Schmidt, R., & Wrisberg. (2008). Motor *Learning and performance*: A situation-based learning approach. IT.Huma Kinetics. California. US.

Shea, C., & Zimny, S. (1983). *Context effects in memory and learning information In R.A.* Magill (Ed.), Memory and control of action. Amsterdam: North Holland.

Shea. J. & Morgan. R. L. (1979). *Contextual interference effects on the, retention and transfer of motor skill. Journal of Experimental Psychology:* Human Learning and Memory.

Shea, J., & Zimny, S. (1988). *Knowledge incorporation in motor representation*. In O.G. Meijer & K. Roth (Eds.), Complex movement behaviour: The motor

Sheelan, M. (2013). *Effect of teaching by constant practice and varied practice in different distance for some tennis skills and retention.* Dar Al.Elm. Baghdad.

Sherwood, D.E., & Lee, T.D. (2003). Schema theory: *Critical review and implications for the role of cognition in a new theory of motor learning*: Research Quarterly for Exercise and Sport.

Shewokis, P., & Del Rey, P., & Simpson, K. (1998). *A test of retroactive inhibition as an explanation of contextual interference*: Research Quarterly for Exercise and Sport. The Falmer press. US.

Wajeeh. M. (2012). *Motor learning learning and practice scheduling*. Adeeb publish house. Baghdad.

Wajeeh, M. (2013). *Motor learning and practice scheduling*. National library. Baghdad.

Wright, D., & Whitacre, C. (1992). *The contribution of elaborative processing to the contextual interference effect*. Research Quarterly for Exercise and Sport. 30-37, 63. US.

Yarub, K. (2010). *Motor learning principle and application*. Second edition. Al-kalmia Al- tayiba publish house.

Young, D.E., Cohen, M.J., & Husak, W.S. (1993). *Contextual interference and motor skill acquisition.* On the processes that influence retention. Human Movement Science.