EFFECTS OF USING MENTAL IMAGERY AND MENTAL- PHYSICAL METHODS IN ACQUISITION AND RETENTION OF LONG JUMP SKILL

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EFFECTS OF USING MENTAL IMAGERY AND MENTAL- PHYSICAL METHODS IN ACQUISITION AND RETENTION OF LONG JUMP SKILLS

ABSTRACT

Mental imagery is a technique using all senses, thoughts, feelings, emotions and sensation to recreate an experience in your own mind. It is used for improving performance through visualize the skill mentally. Correct the errors by the right conception of the skill want to be learned. Mental– physical method depends on give the student's time to build an idea of the long jump skill performance by using metal imagery method which include reading the text about the performance of skill, watch the performance image and visualize the long jump skill performance. The aims of this study was to investigated the effect of mental imagery and mental physical method on student's learning progress and retention of long jump skill among secondary school students in Iraq. A total of 90 students participated in the present study. The study was conducted using quasi-experimental research design where long jump skills test were administered to the students before and after a treatment process. These students were divided into three groups of 30 to be taught by the same teacher. In the first experimental group, mental imagery was employed whereas mental physical method was employed for the second experimental group, while in the control group, traditional learning method was used. The results showed that after approximately six weeks students in the experimental groups (mental imagery and mental physical method) scored significantly higher than students with traditional learning method in learning long jump skill. As a conclusion, the results of a current study showed that mental physical method is effective to a large extent in improving students' on learning long jump skill and retention the skill. The study supports the effect of mental- physical learning method in Iraq secondary school students. This study is very important as it presents substantial

evidence regarding the fact that the modern learning method can significantly and positively affect the educational level of the students during secondary school.

KESAN MENGGUNAKAN IMEJAN MENTAL DAN KAEDAH MENTAL-FIZIKAL DALAM PEMEROLEHAN DAN PENGEKALAN KEMAHIRAN LOMPAT PANJANG

ABSTRAK

Imejan mental adalah teknik di mana semua deria, pemikiran, perasaan, emosi dan sensasi digunakan untuk mencipta sesuatu pengalaman dalam fikiran anda sendiri. Ia digunakan untuk meningkatkan prestasi dengan membayangkan kemahiran, membetulkan kesilapan secara mental dengan menggunakan konsep yang tepat tentang kemahiran yang ingin dimuridi. Kaedah mental-fizikal bergantung kepada masa yang diberikan kepada murid untuk membina idea tentang prestasi kemahiran melompat panjang dengan menggunakan kaedah imejan mental, yang termasuk membaca teks mengenai prestasi kemahiran tersebut, menonton imej yang menunjukkan bagaimana kemahiran itu patut dilaksanakan, dan memvisualisasikan kemahiran melompat panjang itu dijalankan. Kajian ini bertujuan menyiasat kesan imejan mental dan kaedah mental-fizikal terhadap kemajuan pembelajaran murid dan pengekalan kemahiran melompat panjang di kalangan murid sekolah menengah di Iraq. Seramai 90 murid telah menyertai kajian, yang dijalankan dengan menggunakan reka bentuk penyelidikan kuasi eksperimen, di mana murid diberi ujian tentang kemahiran melompat panjang sebelum dan selepas proses rawatan. Murid-murid ini dibahagikan kepada tiga kumpulan, dengan seramai 30 murid di dalam setiap kumpulan, dan mereka kemudian diajar oleh guru yang sama. Imejan mental digunakan untuk kumpulan eksperimen pertama, manakala kaedah mental-fizikal digunakan untuk kumpulan eksperimen kedua, dan kaedah pembelajaran tradisional digunakan untuk kumpulan kawalan. Keputusan menunjukkan bahawa selepas kira-kira 6 minggu, para murid dalam kumpulan-kumpulan eksperimen (imejan mental dan kaedah mental-fizikal) mendapat skor yang jauh lebih tinggi daripada para murid yang menggunakan kaedah pembelajaran

tradisional untuk memmuridi kemahiran melompat panjang. Kesimpulannya, hasil kajian semasa menunjukkan bahawa kaedah mental-fizikal memang berkesan dalam meningkatkan tahap pembelajaran murid terhadap kemahiran melompat panjang dan pengekalan kemahiran tersebut. Kajian ini menyokong kesan kaedah pembelajaran mental-fizikal di kalangan murid sekolah menengah di Iraq. Kajian ini amat penting kerana ia membentangkan bukti yang nyata berkenaan fakta bahawa kaedah pembelajaran moden dapat memberi kesan yang signifikan dan positif terhadap tahap pendidikan para murid semasa mereka di sekolah menengah.

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Physical education constitutes the most significant part of a school curriculum. It is only with the physical education lessons that real educational experiences can be imparted and resources to achieve the objectives of school curriculum (Patton & Mocougall, 2019). Physical education lessons are usually included at least twice a week, so that all students at school are benefitted. Moreover, it is necessary for a physical education teacher to take into consideration all the relevant teaching aids and methods, so that the objectives of the classes can be met (Al-Hafiz, 2014). Out of the several advantages gained through the inclusion of physical education in schools highlighted few . Leisure-time physical activity plays a significant educational role by enabling the learners to develop a positive orientation and high productivity for leisure time. The key objective of physical education is to enable the learners improve their motor skills, provide them with knowledge about those skills, and also mould their educational inclination and values positively. Several scientific research and studies that emphasise on the value of the relationship between education and sports can identify with the findings of the research carried out by (Al-Hafiz, 2014). A considerable amount of difference in the level of academic achievement has been observed between students who are non-practitioners of sports and those who practise indoor and outdoor sports activities, where practitioner students were found to have an edge over others. In other words, it was found that students who were involved in sports and participated in competitions were more likely to perform better academically. Physical education, which is an important part of public education, enhances the motivational level among slow learner by enabling them to develop their aptitudes, abilities, talents and orientation, thereby building their personalities in line

with the overall educational goals (Fredericks, 2006). Therefore, the lessons of physical education are regarded to have a positive influence on the students, helping them to improve their willingness to learn, develop skills and explore their potential. A brief introduction about mental imagery, one of the measures related to teaching skills, which is applied in the field of physical education, has been reviewed in this study. Maksoud (1986) explained mental imagery in the field of motor learning as "the image captured by the learner by considering the details and clarification of the movement, where the imagery remains memorable in the brain and becomes the performance basis for the learner of the movement". This implies that a learner is able to learn the movement by taking a mental imagery of the complete motor performance. There is a positively correlated relation between mental imagery and learning, particularly in the motor learning field. The mental imagery helps to see the cognitive side of the performance in order to understand the entire performance better, and then the imagery is called up or replayed to separate the image parts to emphasise on the correction or improvement of each part of the movement. As explained by Khyoun (2002) the mental imagery has two directions; the first direction can be applied as cognitive part in educational process, while the second direction can be used as a motivational factor to improve performance.

In the studies carried out by, Panteli and Tsolakis (2013) it is revealed that new intervention on kinematic variables in long jump development area can significantly contribute in achieving best results in this field. The majority of these studies recommended an intervention training program for athletes. In the present study, attempt has been made to improve the long jump performance of students in school with the use of mental imagery and mental-physical educational techniques.

The impact and effectiveness of mental visualisation in teaching and improving long jump skills among students has been analysed to highlight the significance of this study. This effectiveness is measured across different parameters such as the overall teaching process time, effort required and improvement in skill level or learning efficiency. One of the many reasons for selecting the long jump skill for the study is that this skill is one that contains four stages of performance. To understand these stages and find a connection among the stages, it is necessary to study the long jump skill and analyse the use of new learning techniques that make it easier for students to acquire the skill. Moreover, the researcher was a track and field player, which makes it the preferred subject of study. Also, as elaborated by Ibrahim (2012) the teachings of long jump skills in schools have not undergone any changes and there are no much application of new learning techniques, making it a topic worth studying.

1.2 Problem Statement

The long jump skill is an athletics skill, the core of which requires technical performance. The long jump skill is composed of a series of different moves in a row that are related to each other through performance (Flora Panteli, 2013). The objective of this skill is to achieve mechanical performance that enables the performer to jump as far as the student can from the point of take-off (Filush, 2012). In a long jump event, the three motor qualities - strength, speed and agility are critical factors for success. The overall success of the jump may be impacted by any alterations or adjustments in the approach, take-off, flight, or landing. According to Nicolae (2017) all the movements involved in long jump need to have great efficiency in order to attain the intended skill. As stated by Ibrahim (2012) a major difficulty faced by the students includes weakness in adapting to the learning process of long jump. This

weakness in adjusting to the learning approach is primarily due to the long-standing traditional learning approaches used by the physical education trainers.

As explained by Hattie (2011) the conventional approach of imparting physical education normally depends on the direct teaching of new skills, carried out in isolation, ensued by repetitive practice drill of the new skill and followed by a closing game (or competition or modification thereof) to try-out the acquired skills in context. This conventional learning model applied for physical education training characteristically depends on explicit and direct instruction teaching strategies. However, pre-service as well as experienced teachers consider direct instruction teaching as a poor or ineffective teaching approach.

As observed by AL-Rubaie (2009) high school students in Iraq face difficulties in learning the long jump skill. This problem significantly impacts the motor learning levels of the students, thereby making the physical education lessons fall short of their objectives. This problem faced by students in Iraq requires to be addressed in the initial stage of learning through the application of appropriate teaching techniques. In order to improve the students' motor learning levels and long jump skills, it is imperative to address this learning problem faced by the students. As stated by Khyoun (2002) no successful retention can occur unless the learning process has been implemented completely and the students have entirely mastered the skill. According to the studies of Mahmoud (2009) and Khyoun (2002), it was found that high school students face issues in learning the long jump skill, and also find it challenging to retain the skill for the long term. As concluded by AL-Rubaie (2009) the students generally find the mastering of the long jump skill challenging because this skill is formed of four stages and linking the four stages with each other is of considerable difficulty. To get a better understanding of the problem, researchers studied the subject across various countries.

In the study carried out by Chang (2013) the emphasis was on the sport of track and field and the new teaching techniques for long jump.

According to Avrojn (2014) there is a significant and positive role played by mental imagery in acquiring and developing motor skills. As mentioned by Saleh and Ata (2008) mental imagery enables the students to successfully and effectively master motor skills. After considering what has been already presented, the research titled "the effect of using mental imagery on learning and retention of long jump skill" was decided to be carried out for the purpose of supporting the improvement of the existing education process.

The main disadvantage of the conventional learning process is that it does not focus on the students 'capability or aptitude to understand the purposes behind the movements. On the other hand, the traditional process solely emphasises on the physical practice or repetition of the skill which makes mastering of the skill a really long process and is also not scalable for high number of students in the physical education class. However in this study the researcher try to solve the problem of the traditional learning method by teach the students with other learning method.

1.3 The objective of the study

The objective of this study is to understand and analyse the impacts of using mental imagery in the learning and retention of the long jump skill. The specific and detailed goals that the study intends to achieve are outlined under research objectives. By providing the students with images and description of the long jump skill, their learning ability and performance are expected to improve. In addition, the students will be asked to identify the appropriate technique, through the images and supporting text,

which they consider would help in improving their performance. The primary objectives are:

1. To assess the impact of mental imagery, conventional method and mental-physical method on the learning of long jump skill.
2. To study the impact of mental imagery, conventional method and mental-physical method on the retention of long jump skill.

1.4 Research Questions

The main focus of this study is to analyse the impact of intervention programs on the level of learning new skills by beginners, when introduced between traditional practical training and mental imagery. To gain further understanding of mental imagery, the following questions were asked based on the problem statement:

1- Does the combination of mental imagery, traditional method and mental-physical method have any impact on long jump skill?

2- Is there any impact of mental imagery and traditional method on long jump skill?

3- Do mental imagery and mental-physical method cause any effect on long jump skill?

4- Is there any impact of mental-physical method and traditional method on long jump skill?

5- Is there any different between mental imagery, mental-physical and traditional method on retention of long jump skill?

1.5 Research hypotheses

The expectations of this research have been written down after studying the earlier researches and references that focused on problems similar to the problem discussed in this study. The hypotheses stated below were tested in the study:

Ho_1: The combination of mental imagery, traditional method and mental-physical method has considerable impact on long jump skill.

Ho_2: There is significant impact of mental imagery and traditional method on long jump skill

Ho_3: There is significant impact of mental imagery and mental-physical method on long jump skill

Ho_4: There is significant impact of mental-physical method and traditional method on long jump skill

Ho_5: There is significant difference in mental imagery, mental-physical and traditional method when it comes to retention of long jump skill

1.6 Operational Definitions of the Terms Used

1.6.1 Mental Imagery

The mental imagery is referring to a mental state where the athletes imagine themselves, using all the senses of the athletes (smell, hear, feel and sight), in a particular circumstances performing a particular activity. The mental imagery must project the athlete performing successfully and provide the athlete with a feeling of satisfaction and accomplishment (Champaign, 2018). In this study, mental imagery refers to the sequence of steps taken by the students under the supervision of the physical education teacher. It is usually achieved by watching a film clip of a long

jump performance, followed by a time given to students to reflect and think about the skill, and apply the learning from the film clip mentally in their imagination.

1.6.2 Learning.

Refer to the procedure of developing motor skills through practice or repetition with long-term effect in the ability to respond. According to Youssef (2004) the basal nuclei and cerebellum play a significant role in movement coordination. In this study, learning refers to the ability of the students to gain benefit from the methodology and enhance their long jump skill performance.

1.6.3 Retention.

Retention as defined by Halil (2003) the amount of information about the skill or movement that is stored and is available to the individual, and can be recalled or retrieved after a definite interval of interruption in the performance of the skill or movement. Retention is "the ability of the individual to recall and retrieve information that reflects the acquired learning and is a definite measure to assess the motor learning performance after the learner abstains from any related activity for give interval of a number of days. When the performance measurement after retention is close to the initial performance measurement, the retention can be called perfect and the learning as effective. In order to evaluate the retention ability after the initial learning, the learner should be given a definite time period of one or two weeks, where there is no inclusion of related activities for the subject, and then the performance skill and ability can be tested (Kiens & Nielsen, 2012).

1.6.4 The long jump.

The long jump, which is also historically known as the board jump is an activity of track and field where the athletes endeavour to leap as far as possible from a point of take-off by combining strength, speed, and agility. According to the findings of

Faraj (2006) this activity has a history of being a part of the Ancient Olympic games, and has been a modern Olympic phenomenon for men since the first Olympic games in 1896 and for women in 1948. The long jump activity can be deconstructed into three or four stages: first is the approach followed by the take-off then the flight and finally the landing.. In general, learning the long jump skill requires training in a number of areas such as jumping, speed work, weight training, over distance running, plyometric training.

In this study, long jump activity has been included in the physical education curriculum. For the following methodology

(A) Mental-physical method of motor learning, physical exercises and mental imagery are used simultaneously to enable learning of the motor skills (Khalatbari, 2011). In this study, the mental-physical use by the researcher as combined between mental imagery and the physical method in the purpose of getting the maximum benefits of both methods and bringing out the best in the students.

(B) Traditional Method is when the instructor teaches the students by learning through memorization and copy the technique of the teacher's movement which leads to not developing the critical thinking of the students, the ability to solve the problem and the decision making skill while the modern teaching approach involves of more students interacting for of teaching (Essays, 2018).

1.7 Limitations of the study

The objective of this study is to ascertain how effective the use of mental imagery is in the learning and retention of the long jump skill. Even though the research was

prepared after thoroughly considering the different factors, still the researcher is aware of its shortcomings and limitations. In the beginning, the research was carried out in three intermediate classes that went on for four weeks. However, four weeks is not sufficient for the teacher to observe and analyse the performance of all the students in the class. It would be beneficial if the study was carried out for a longer period, since at present, the time allotted for the entire lesson in the school is only 45 minutes which is not adequate for conducting the study. Moreover, an intact sampling methodology for selection is used, where control and experimental groups are represented through the selection of three classrooms. As a result of using the intact sampling methodology, the sampling that is selected from the school already has the students ordered alphabetically. Also, the access and availability of data related to motor learning and retention is restricted.

Another constraint of the study is that the population of the experimental groups consisted of only male students as the selected school had male students only. Hence, it is desirable to conduct the study for both the male students and the female students.

1.8 Significant of the study

This study can be considered as an important attempt to encourage a good and healthy study environment in the classroom and provide adequate motivation to the students for learning. Since the study aims to enable the students learn and perform the skill from a point of thorough understanding of the skill, and not just mimic the teacher's movements, the study is going to add a lot of value to the skill learning of the students as well as professional players. Additionally, teaching with the use of mental visualisation will enable the students to think deeply and use their imagination, and

thus develop their own techniques in their minds. This will immensely improve the education quality and the efficiency of learning the skill, compared to the traditional approach of imparting the physical education lessons.

Therefore, this study has considerable beneficial impact on the physical education curricula of the schools. Moreover, this study aims to improve the understanding of the functioning of mental visualisation and its influence on the performance and training of players in the field. This study also plays the role of source information for researchers who aim to understand the field of education in general and the specific field of motor learning.

The observations made in this study would help the teachers who are interested in improving the physical education teaching environment in the schools and are also interested in adding to the theories taught in the classes of physical education. The outcomes of the coronet study motivate the physical education teachers to apply the new teaching and learning methods depending on different situations and subject to students' needs.

1.9 Summary

In this particular chapter of the study, the discussion is on the problem faced by the school students in learning the skill of long jump through the traditional approach of teaching. The study also focuses on reviewing the potential solution to the problem. the main purpose of the current study is to analyse the impact of mental imagery, traditional method and mental-physical method on the learning and retention of the long jump skill.

CHAPTER 2: LITREATURE REVIEW

2.1 Introduction and History

In general, mental imagery was not known as an instrument that benefits enhancing the performance. Time and again, the practice of imagery was considered as wrong and reprehensible. In the old Testament, and also in the study carried out by Wolpin (1986) imagery is associated with evil. Before the behaviourist revolution came into being, the imagery has perceived as an unreasonable chase of mystical power. It started when the psychologist from Europe started implying the imagery during their treatment and therapy sessions in the late nineteenth century that imagery gradually started to become more acceptable and customary. Most likely, Janet was the first European to integrate imagery in psychotherapy. After the early European pioneers and practitioners of imagery were gone, the interest in imagery significantly reduced during the first half of of the 20th century. Until the 1960s, imagery was largely dormant subject. As observed by Jackson and Nigel (2013) it was during this period that several sub-disciplines in psychology started to emerge. This renewed attention on the interconnected disciplines of psychology enables imagery to be the subject of interest once again. This point onward, imagery started receiving major attention from the sub-discipline field of psychology (Roumbou, 2017). Researchers of one such sub-discipline, known as sport psychology, were specifically interested in the implementation of imagery. There was a radical growth in the number of studies based on imagery that was connected to motor skill performance in sports. Several experiments were conducted that included a diverse range of imagery processes that can be associated with different motor tasks. Even though the bulk of the research on

imagery related to sports psychology was carried out during the 1960s and 1970s, there were a number of experiments that were conducted much earlier in the century when imagery was a subject of little interest (Feltz & Landers, 1983). Researchers are starting to accept the significance of imagery in all areas of life, and imagery is now considered to play a very important role in general psychology as well as sports psychology.

This study reviews the existing learning process used for the teaching of the long jump skill to young learners (students) in schools, and analyses the scope of improvement and impact caused by the application of mental imagery on the motor learning process. This study primarily emphasises on four variables, namely practical application (currently using it), mental imagery, skill acquisition, and skill retention.

2.2 Motor learning

According to the definition of motor learning, by Feldman (2012) it is referred to as a "set of internal processes linked with experience or practice that would results in relatively lasting changes in the ability for skilled behaviour". In other words, motor learning constitutes of complex processes in the brain that take place as a response to practice or experience of a certain skill, which eventually causes transformation in the structure of the central nervous system that further enables the formation of a new motor skills (Sullivan & Fulk, 2014).

As mentioned by (Neil & Campbell, 2006) motor learning takes place through three stages. These stages define how each learner learns the new skill, movement, or activity. Anyone who attempts to learn a motor skill has to go through each of these three stages. However, the length of the learning process can vary for every individual and the advancement in the learning process will depend on a range of factors such as

organisation of practice, environmental stimuli, motivation for the learner, and feedback received.

1. Cognitive stage

   During the very early stages of the motor learning, the main objective is to achieve a full understanding of that specific skill. The learners need to ascertain the purpose of any given skill followed by assessing the environment related factors that could influence the ability of the student in performing the skill. On the other hand, the teachers need to ensure that the learners have an optimal environment for learning, which is free of distractions. In this stage, the learning is guided through visual inputs and trial and error method for the learners. The learners will definitely stumble a few times and most likely face a little awkwardness before they master the skill. In reality, the learning process is based on performing the skill which starts way before the learners actually undertake their first independent or assisted step, as they have been creating a mental imagery by visually observing others and getting an understanding of the purpose. So even though the initial stages of learning can be clumsy, it is a necessary part of the process of transitioning from understanding the skill for executing or acquiring it.

2. Associative stage

   In the associative stage, the learner starts to exhibit a more refined performance of movement as a result of practice. The learner can now move on from "what to do" of the first stage to the "how to do" of the next stage, as they have had some practice of the skill and have also identified the different stimuli that might impact their performance. In these situations, proprioceptive cues are of more importance while visual cues are relatively less significant.

Proprioceptive cues refers to the relative sense of possession of the player's own body parts and the strength of the effort that is being employed. To understand these cues, the learner focuses on the kind of input being felt in both the joints and muscles, and how there body is being moved in that space. With more practice, the learner is able to acquire more proprioceptive inputs that in turn aid the learning hence, the more the practice, the better. In the early stages of learning, the students exhibit clumsy behaviour with large base of support and arms up high in the guarded position. However, with practice, the students start taking longer time and more controlled jump, narrowing the base of support and maintaining a relaxed body position. These changes in behaviour imply that the students have advanced to a more refined movement and have passed the early stage of learning.

3. Autonomous stage

   This stage is considered as the final stage of learning, where the motor skill becomes almost involuntary or instinctive (automatic). The autonomous stage is considered as the final stage of learning, where the motor skill becomes almost involuntary or instinctive. Once the learner advances to this level of learning, it becomes possible for the learner to perform the skill with a very little cognitive involvement irrespective of the environment. In this study, the students can now jump in a predictable environment and an unpredictable environment such as a crowded field with equal ease.

2.3 Mental visualisation

Imagery refers to the method of recreating an experience in your mind with the help of all the senses, emotions, sensation, feelings, and thoughts. Today, mental

visualisation is used every day by some of the best athletes of the world (Cotterill, 2006). According to research, it is found that imagery is effective in improving performance. As observed by Culbert and Olness (2010) those who practice their performance mentally through visualisation perform better during the actual performance than those who do not. Nonetheless, it is also essential to follow certain specific techniques in order to avoid some of the potential difficulties related with imagery.

The study conducted by Sami (2017)concludes that mental visualisation is one of the most significant psychological skills. One can enhance one's performance of a skill by visualising the skill mentally with the right conception of the skill and correcting errors in the imagery. Mental visualisation, in essence, can be defined as the mental progressions that intend to attain a performance result through the reflection of the phenomena or realisation that the athlete already had due to prior experience.

To begin with, imagery has innumerable uses and advantages. Probably, the greatest positive aspect of imagery is when everyone processes the ability to practice it and it can be applied in almost anywhere and anytime. It is a skill that is developed through practice (Mullin, 2009). Some of the uses for mental visualisation include building one's confidence, rehearsing tactics, cultivating positive thinking, problem-solving, learning and practicing a particular skill, getting a control over nerves, adopting a preparation and performance routine, and review and analysis (Bull & Shambrook, 2004).

The use of scientific techniques helps visualise a past experience from memory as well as create an imagery of movements or future events that have not been experienced before in order to prepare the mind for future performance. This sort of mental visualisation is referred to as mental experience. This form of mental

visualisation enables the player to have clarity about the expertise required in performing the skill, thereby letting the brain send clear signals to the body parts so that movement of each part is such that it helps to achieve an optimal performance (AL-Majid, 2002).

According to Abdul-Salam (1997) the physical condition and knowledge of the skill does not reveal the performance or skill level of the player in most cases; instead, it is reflected by the degree of mental maturity of the player and the extent of awareness that the player has about his or her potential and exact abilities.

The process of mental visualisation is quite complicated because it involves a number of senses, including the visual sense, auditory sense, motor senses, and some other senses. In mental visualisation, memories of movements or parts of it are recalled, which are saved in the memory bank of the mind as a result of earlier experiences. Thus, the perception created by accumulating these multiple aspects can help in attaining the desired performance outcomes and aid in learning the skill better. The diverse range of perceptions will play a significant part in the performance of the player by enabling the player to develop thinking skills, face different situations and solve problems. Hence, mental visualisation is one of the major skills that need to be reinforced and strengthened so that performance can be upgraded and the levels of achievement can be improved.

There are two main elements or components of mental visualisation. The first is voidance which is associated with the degree of realism and purity in the perception of the player attained through personal appreciation. The factors that assist in acquiring clarity of the mental visualisation usually include all the senses that make the image more detailed and clearer. The second element is control that ensures that the image created stays in the mind. The second element is also responsible for improving the

image stored in the brain. Control in the mental visualisation process helps the player to imagine and create the exact performance that the player wants to achieve; the level of control can range from macro-control in the picture to partial control and total control as mentioned by (Arabi & Jamalthe, 1996). However, mental imagery cannot be considered as a substitute for practical physical training. It only acts as an accompanying aid that can enhance the performance skills of the player.

Moreover, there are several studies that substantiate these advantages of mental imagery and explain them at the neural level. According to the observations made in these studies, electrical activity takes place in the brain and muscles during mental rehearsal that are connected with physical movements. The brain imitates stimulating the muscles in a pattern that is necessary to apply the skill, but not at a level where the body moves in reality. According to Bull and Shambrook (2004), similar mental activity takes place when the player makes observations of other people performing a specific action. This adds learning advantages for observers who watch their role models in action. This form of mental activity is known as scenario performing which also facilitates skill acquisition (Jensen, 2009). When an athlete watches his role model perform, the mirror neurons trigger certain specific patterns. Then, when the athlete performs the observed behaviour, the same pattern of neuron triggering takes place. According to Dufesne (2007) the neural pathway strengthens with every movement or rehearsal. It also functions the opposite way, that is, when a certain neural pathway is not used, it will gradually atrophy. Therefore, if negative images are consciously blocked out repeatedly and substituted by positive images, then it is highly unlikely that the negative images will emerge during future mental rehearsals (Shane & Murphy, 2005).

There is numerous beneficial guidelines available for beginners who are starting with the practice of mental imagery. Mental visualisation should be practiced in an environment which is relatively quiet and does not have interruptions or distractions. During the practice, it is imperative to incorporate and integrate all the senses, most importantly the kinaesthetic senses that include the sense of balance and weight movement. This inclusion of senses enables the brain to recall images that are already stored within the memory. Moreover, it is essential to practice it in real-time as this helps the athlete to prepare for a full-paced real situation. The emphasis should also be on past mistakes and failures, in order to instil corrective measures in future imagery and thereby diminish the possibility of their recurrences (Bull & Shambrook, 2004).

2.4 Effect of imagery

Over the past 5 decades, the use of mental imagery has been elaborately researched, specifically in the field of sport psychology and motor learning (Fishburne, 2010). As highlighted by , Luiselli and Reed (2011), 99% of the235 of Canadian athletes who participated in the 1984 Olympic games reported using mental imagery. According to the data, the athletes agreed that they engaged in systematic imagery during the training, at least once a day, for about 12 minutes each time,4 days a week. At the 27 Olympic sites, some of the athletes reported to have engaged in imagery in preparation for their events for almost 2 to 3 hours (Vealey, 2007). This validates that an increase in the mental visualisation ability in turn improves the impact and effectiveness of imagery training. According to the research done by Vealey and Greenleaf (2006) it is suggested that the effectiveness of mental imagery as a tool of mental imagery can be classified into three areas. The same is represented in Figure 2.1.

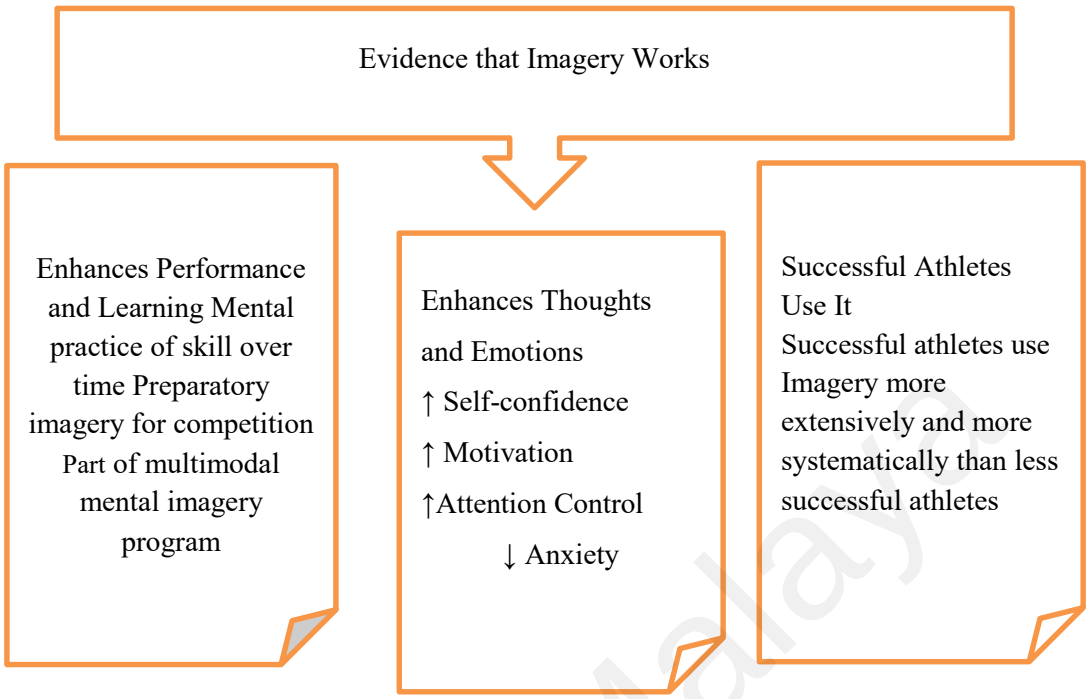

Figure 2.1 summary of the research report for the efficacy of imagery: (Vealey & Greenleaf, 2006)

According to the research conducted by Vealey & Greenleaf (2006), there are a number of advantages for using mental imagery. To begin with, imagery has been proven to improve sports skill learning and performance. Second, imagery is seen to have positive influence on the thoughts and emotions of athletes, helping them to be less critical of the athlete's performance. Lastly, research showed that successful athletes apply imagery more systematically and extensively as compared to the athletes who are relatively not successful.

Several studies that substantiate the impact of the mental imagery on the improvement of athletic performance Jones and Stuth (1997), Raabe and Heisenberg (1999) motor skills and performance Morris, Spittle and Watt (2005) and learning of basketball strategic skills (Guillot, 2009). As observed in these studies and reviews, the mental imagery tool when used as an element of sport psychology can be

considerably beneficial for the success of the athletes extending their physical performance, particularly during competitions. Mental rehearsal has been extensively used by coaches and athletes as a practical and psychological tool for performance enhancement. Mental rehearsal interventions have the potential to enable athletes to change attitudes, speed up learning, overpower competitive stress, identify and solve problems related to performance situations, and enhance performance. As suggested by Calmels (2004),there are specific kinds of imagery as well that are effectual in alleviating the anxiety level of the athletes and altering their perceptions about performance from negative and limiting to facilitative, challenging and motivating.

Moreover, mental imagery has evolved to be an essential element in the tactically organised learning experience that is implemented in sport psychology and motor skills domain. A number of studies have substantiated that optimisation of motor performance occurs when mental imagery is applied along with physical practice.

2.4.1 Internal and external mental visualisation

There are two key perspectives that are used for imagery: an internal or inside perspective and an external or outside perspective. When the images are visualised from the first-person point of view, it was referred to as the internal or inside perspective. On the other hand, the external or outside perspective is like watching oneself on television. The internal perspective helps to improve the quality of the 'feel' component, while the external perspective is beneficial for objectively assessing and reviewing performances. Both the perspectives need to be applied to achieve optimum results. However, there is no conclusive evidence that indicates that one has more advantages than the other (Bull & Shambrook, 2004).

2.4.2 Internal mental visualisation

Also called the kinaesthetic imagery, it refers to imagining an activity in one's head in a way where it feels like one is actually performing the act.

2.4.3 External mental visualisation:

In external mental visualisation, the player invoke image by sees other players perform, for example, the performance of a champion athlete or an outstanding player. A player practises external mental visualisation by watching a performance that the player considers as ideal, in movie or TV show (Fira & Shultz, 2001).

2.5 Internal vs. External Imagery

Internal and external imagery are primarily the two basic forms of mental imagery. While practicing mental imagery, the players visualise themselves from their own point of view (Orlick & Partington, 1988). Conversely, the external imagery involves as a third person perspective. According to David and Smith (1987), external imagery is equivalent to watching one's performance on a television or a movie screen. In the field of mental imagery, it has been a matter of considerable discussion and debate as to which perspective, the external or the internal, creates the maximum impact on performance. Even though at times, the internal imagery produces r relatively more exact recreation of a performance, the outcomes are exceedingly inconsistent and hence inclusive. The most important study that endorses the internal imagery was carried out. According to their research, it was observed that the elite gymnasts applied mental imagery more frequently than external imagery. In another study, it was revealed that even elite skiers preferred internal imagery over external imagery. A different study on elite rifle shooters also validated the same findings, where shooters practised internal imagery more than external imagery (Montuori, 2018). All of these

studies indicated that elite performers are likely to use the internal perspective far more frequently than the external one. It can be concluded from these research results that internal imagery is significantly more effectual than external imagery. However, in spite of the fact that internal imagery is the focus of these studies, each study was unsuccessful in manipulating the external versus internal imagery. But the impacts of external and internal imagery on performance have been assessed and compared in two key studies. According to the findings of these two studies, there is no noteworthy difference between the effects of both perspectives. In a study conducted by Sepstein (2016) it was found that in a dart throwing task, there was no substantial difference between the groups practising external and internal imagery respectively. In another more recent study that was based on 59 figure skaters, no noteworthy difference was observed in the implementation of external and internal perspectives (Withers & Wallace, 2011). Additionally, there have been two more research studies that validated that there is almost a similar effect in performance for either of the two perspectives. All these studies are very similar to the studies that endorse the internal perspective as there was no scope for comparing the external and internal imagery. In a particular study, elite racquetball players were involved, while another study was on elite wrestlers. However, in both the studies, no difference was found between the impact of external and internal imagery. There is very little evidence to verify either of the perspectives, since only two studies have focused on the external and internal imagery variables. The outcomes of the empirical data indicate that there is no behavioural evidence to support the idea that internal imagery is superior or more beneficial compared to external imagery in improving motor skill performance (Orlick & Partington, 1988). While there is no substantial experimental evidence to validate the effectiveness of the internal perspective, it is still assumed that internal imagery is

better than the external one. Hence, in the majority of the mental imagery training sessions, the internal perspective gets greater preference than the external perspective. In recent times, several researchers are emphasising that the impact of the imagery is dependent on the skill, that is, while some skills may gain from the use of internal imagery, some other skills may find the use of external imagery to be more effective. It is asserted that the impact of imagery technique is possibly task related, to which form of imagery will have the most significant effect (David & Smith,1987). To elaborate, interactive sports such as tennis, hockey, or basketball will possibly benefit most from external imagery due to the visual adaptations, while individualised sports such as rifle long jump and high jump will likely benefit more from internal imagery because of the involvement of proprioceptive and kinaesthetic feedback (Withers & Wallace, 2011). Nevertheless, the issue of external versus internal imagery is nowhere close to resolution. Still there are several questions that need to be answered, and it is expected that more relevant research in this field will provide the answers.

2.6 Mental Imagery and Learning Motor Skills

In the field of learning and strengthening motor skills, mental imagery has become the most extensively used training technique. In recent times, researches and studies have been carried out expansively to understand the impacts of mental imagery on the learning and performance of sport skills Al-Rubaie (2009) (Rashid, 1998). According to the research evidences, it is found that mental imagery has considerable impact on the acquiring and performance of various sports skills. However, as per the study made by Carless and Douglas (2010) these effects of mental imagery will be effectual only under the circumstances that the athletes have an adequate imagination about the formation method of the skill and that visualisation is imprinted on their minds.

The extent of cognitive demand that a particular task has on a performer is another significant aspect that needs to be considered when analysing mental imagery. If the level of cognitive demand for a specific task is high, the learning that an intermediate skilled performer would have will possibly be more than an advanced performer since the advanced performer already knows and understands the cognitive aspects of the task (Jia Gao, 2016). Several studies that are considered and discussed in this summary have emphasised and assessed the impacts of imagery on advanced performers rather than beginners such as Sophie (2007) (Wolframm, 2011). Due to the fact that beginners have little experience with the specific task, it is highly challenging to construct an accurate and distinct image of the task. As a result, mental imagery will most likely have little impact on the performance of most beginners because they cannot create a realistic image of the task. It is, therefore, necessary to have more researches and studies that focus on different ability levels of performers, such as intermediate and expert. With more research and comparison of different ability levels, where the performers have some prior experience with the task, it becomes possible to have greater understanding and insights on the impacts of imagery at varying ability levels of the performers.

Additionally, it is extremely essential for athletes to visualise challenging and difficult situations as this will enable them to practice the appropriate responses and reactions when some situation in a competitive environment goes wrong or is not as per the expectations. Anticipation is the key entity or critical factor, because it is significantly important to know what to do if some situation arises. Moreover, the emphasis has to be on the process of learn and performance, and not on the outcome alone. However, at times, creating a mental imagery of a successful end result during

practice sessions can be a strong motivating factor, as it reminds the athlete about what he or she is working towards (Miller, 2003).

2.7 Principles of Mental Visualisation

Besides motor skills, mental imagery can be applied to enhance perceptual skills, and memory. A number of researches have been conducted over the last 20 years that investigated the nature and characteristics of mental imagery and unleashed its powers e.g- Erik Maier (2018), (Lucette Toussa, 2019). The Principles of Mental Imagery provide a comprehensive, unbiased, and advanced introduction to the key findings of this research, as well as identify five generic and distinguishing principles that can explain most of them. This particular research takes into consideration the experimental methodologies that have solved several difficult methodological problems that are intrinsic in imagery research. It also covers the latest experimental observations and findings that are not included in other imagery books. The Principles of Mental Imagery collate the work of all significant researchers in the field of mental imagery. The chapters include new research and findings on the role of imagery in human memory, and how human perception is influenced by mental imagery. The following are the most dominant aspects in the study of modern imagery

a- Mental visualisation of the skill performance and outcomes: The athlete or player must create an imagery of the entire performance of the skill, along with the desired outcomes.

b- Attention to detail or exactness: When the details are understood thoroughly, the mental image will be clearer and more effective.

c- Emphasis on the positives: The mental focus on positivity and success during visualisation interestingly enhances the efficiency of responses during performance and improves the level of performance.

d- Direct mental visualisation prior to performance: The athlete or player applies the mental visualisation skills directly at least once before the actual performance, and the number of practice trials is dependent on the athlete's or player's loopback mode and specialisation of the skill.

e- Mental visualisation at par with the performance speed: The mental visualisation for the athlete must take place at the same speed as that of the actual performance of the skill or at a faster speed.

2.8 Mental visualisation and its Relationship with Skills Performance.

The mental visualisation or rehearsal is a highly efficient tool for the mind to communicate with the body because the body only communicates through images, and hence it is of great value for athletes and should be extensively used (Jensen, 2009). But it is fundamental for the athletes to have realistic expectations because mental imagery can assist athletes to improve their performance skills only if they believe in the process and journey, and practices frequently (Cotterill, 2013). As mentioned by Shane and Murphy (2005) the repetition and practice of the skill is of utmost significance and the most critical aspect of imagery because the only method to improve the skill is to have increased clarity and control of the mental images. To conclude, the repeated practice also makes the skills hardwired in the brain; a dearth of practice will cause the old erroneous habits to resurface under high pressure environments (Bull & Shambrook, 2004).

However, a number of aspects need to be considered when using imagery, since ignoring these aspects or situations could likely impact an athlete's performance negatively. To begin with, it is necessary to keep in mind that images can have a unique personal meaning for every individual and hence no two athletes will relate an image with the same meaning. For instance, when figure skaters were made to visualise a golden ball, some visualised the image of a calming aura while others were stressed and blinded by the perceived image. Similarly, there can be unfavourable impact caused by relaxation imagery in strength events. Also, visualising the end result during the progress of a competition can prove to be distracting for some. Some of the relevant and possible problems associated with visualisation are the absence of imagery control when unfavourable images or distracting thoughts arise in the mind. This can prove to be dangerous as the impact of negative images is way more intense and stronger than the positive impacts of favourable images. But almost all challenges and problems can be mitigated or overcome with a suitable methodology that replaces negative images with positive ones through relaxation imagery and self-talk (Shane & Murphy, 2005).

On the other hand, mental imagery has other additional usages that help to address the various sports performance related challenges cording to Bernier (2010), Kaoua (2016) (Williams, 2017) :

1. Mental practice of specific performance skill.
2. Improving confidence and positive thinking.
3. Improving problem solving skills.
4. Controlling arousal and anxiety.
5. Preparation for performance.
6. Maintaining mental freshness during injury.

2.9 Retention

One of the key objectives of mental visualisation is to attain stability of skills, knowledge and physical attributes, so that the acquired skills and knowledge are retained over time. The term retention is usually used to indicate the term memory. Several researchers have studied human memory and made observations about the capacity it has to save information over time. Various studies have revealed the workings of the memory, how information is saved and permanence is attained, and how the information decays and ends over the years through a statute of limitations in a state of uncertainty as mentioned by Saad and Fahim (1998).

The classical literature and definitions of retention focus on the extent to which people can recall or (perform) a previously practiced skill or (learning) after a certain time has elapsed. It is thus concluded that retention is potentially dependent on an individual's memory of the skill or learning. As mentioned by Voltage al-Kholi, Annan, and Jelloun (1998), retention can be defined as the level of performance after certain duration of no training. According to Halil (2003) retention can be defined as the amount of information that an individual can recall about the performance of a movement or skill after a specific period of interruption. As observed by Halil (2003), there is an overlap of impact between and within the educational components of intensive exercises, and the retention of some tennis skills. Joiner and Smith (2008) stated that the everyday variables that may impact the retention abilities of motor skills of an individual include: the skill level attained by the individual during the initial learning period, transfer of skills of one task for the performance of a different task, distribution of practice in the course of training; existence of interfering activities, introduction of extra test trials before final testing; and use of part-task versus whole-task training methodologies.

To assess the degree of retention after implementing the treatment, one or two weeks need to elapse without the involvement of any related activity, and then the subject should undergo the performance test to ascertain their retention abilities (Roig , 2012).

2.10 Conceptual Framework

In this study, the conceptual framework that has been implemented is reliant on the variables present in the research. There are basically two types of variables: the dependent variables and the independent variables. As presented in Figure 2.2, the dependent variables of this study include long jump performance and retention, while the independent variables include traditional learning method, mental-physical methodology and mental imagery method. Long jump retention and performance variables have a mutual impact on each other, where each one has dependence on the other. On the other hand, mental imagery, which is an independent variable, has impact on the dependent variables, that is, long jump performance and retention. The mental-physical method, another independent variable, also has impact on the dependent variables of long jump performance and retention.

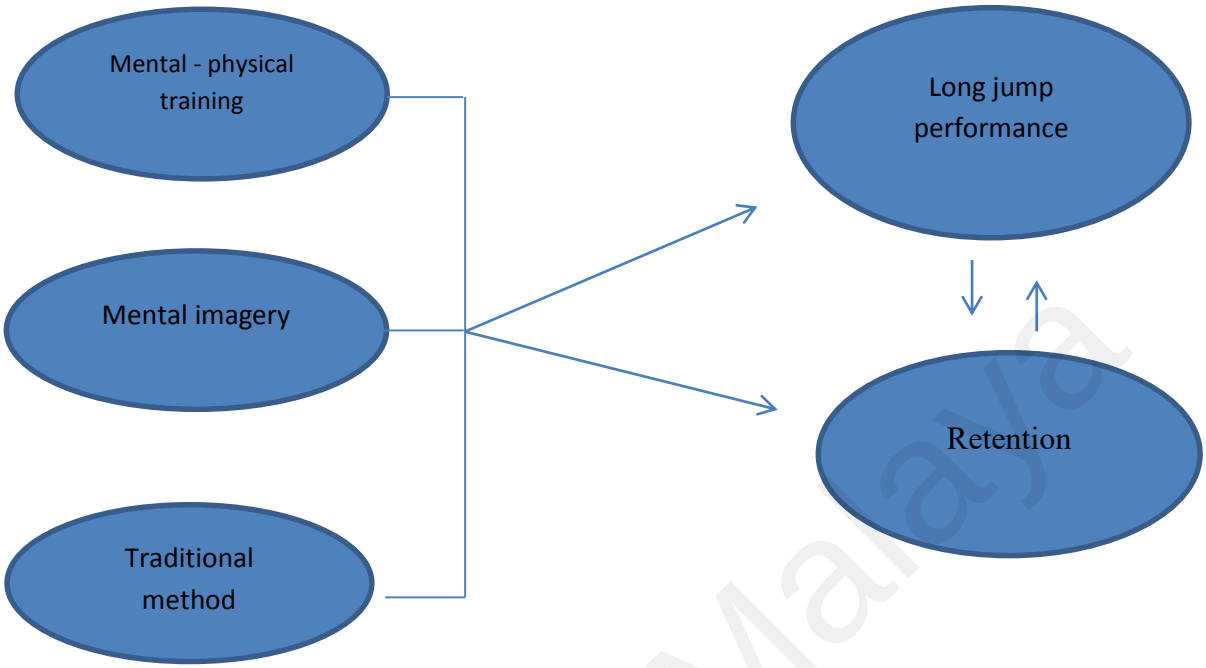

Figure 2.2 Conceptual framework

2.11 Theoretical framework

According to the works of Munzert and Lorey (2009) imagery can result in the imagination of future events. Several theories have been put forward to describe the functioning of imagery and how it impacts feelings, thoughts, and behaviour. In the theory related to sports, the emphasis has been on providing details on how imagery can improve learning and performance. A lot has been discussed and understood about the functioning of imagery and how best to implement it in order to improve performance, from the studies carried out by Morris (2005) and (Hanrahan & Andersen, 2010). As stated by kiefer (2011) every individual has his or her unique perception and hence each one creates his or her own reality. In recent times, the discoveries made in the field of neuro science are of particular interest, where it has been recognised and established that physical performance and imagery have certain

neural mechanisms in common, a phenomenon or occurrence called 'functional equivalence' (Wake Field, 2009). How can merely thinking about hitting a perfect tennis serve, Jumping over a higher bar, sinking a golf putt, or healing an injured arm enable athletes to accomplish these in real has been an area of major interest. Through visualisation, the mind can produce information from memory that is fundamentally the same as a real-life experience; hence, imagining events can have an impact on our nervous system which is comparable to that of an actual experience (Weinberg & Gould, 2011). In reality, the potential to acquire high muscular strength within a short span of time is functionally important, not only for active stabilisation of joints, but also as a primary quality in different sports disciplines. As cited in Hale (1998) the psycho neuromuscular theory that initiated with Carpenter recommended the ideo-motor principle of imagery. According to Shin (2010) the ideo-motor principle of fundamental mechanism of all intentional human behaviour. Based on this principle, it is concluded that the learning and performance and of motor skills is facilitated and improved through imagery, as a result of the type of neuromuscular activity patterns that are stimulated during imaging. This theory claimed that any thoughts that are prevalent in the mind during imagery would get expressed in the muscle movements. This theory has been referred to as the neuromuscular feedback theory, which suggests that well-controlled and clear images incite explicit muscle movements, particularly in those muscles that are stimulated in the course of the imaged task (Nadalin & Eric, 2011).

2.11.1 Theory.

Theory is a framework or model or paradigm of understanding as well as observed, which influences and moulds what is seen and how it is seen. The researcher

is able to create links between the concrete and the abstract through the theory; the empirical, the theoretical, the observational statements, the thought statements, etc.

Several theories have the objective of elaborating how learning can be achieved. Some of the theories include the symbolic learning theory by Sockets 1934, the Social Learning theory by Albert Bandura 1961, the psych neuromuscular theory, and the attention and Arousal Set Theory. Researchers have concluded that the Attention and Arousal Set Theory is the best or the most apt theory in relation to this study as this theory presents a combination of two important theories, namely the attention and arousal set theory and the symbolic learning theory.

2.11.2 Psych neuromuscular theory.

A number of early psychophysiological studies that form the basis of the psych neuromuscular theory on mental preparedness include studies by (Roumbou, 2017). These psych neuromuscular theories suggest that the effectiveness of visualisation or imagery rehearsal of a motor task is primarily attributable to the feedback generated from the minute muscle innervations that take place when the individual visualises performing the motor skill in his or her mind (and these muscle stimulations are similar in pattern to those during actual performance). According to Morris (2005) the feedback facilitates alterations and corrections in motor behaviour because the imagery stimulates low-level innervation of the muscles that play an intricate role in the performance, reinforcing the specific brain-to-muscle connections or bonds through repeated feedback, which is very similar to the strengthening pattern experienced during physical performance. As Morris (2005) the imaginary movement of bending the arm caused minute muscular contractions in the flexor muscles of the arm. In the research carried out by Weinberg and Gould (2011) electrical activity was observed in the skiers' leg muscles as they visualised skiing the course; and the findings asserted

that the muscular activity kept altering during the duration of the skiers' imagining. The muscle activity was found to be the maximum when the skiers visualised themselves skiing through rough sections in the course, which in reality would require increased muscle activity. When a player exerts vivid and detailed imagination of a movement, he or she makes use of neural paths very similar to the pattern that takes place during real performance of the movement (Fira & Shultz, 2001). Moreover, it has been found that an improvement in strength and skill development is closely dependent on the reinforcement of the neural pathways of the trained muscles, specifically in a dynamic and intense strength training (Calmels, 2004). Let us consider for example the task of perfecting a tennis serve. The objective is to make the swing for the serve as natural and fluid as possible. In order to achieve this, before the serve is made each time, imagine the whole serve from the beginning to the end, along with seeing the ball go into the target zone, and try to automate the move (that is, groove your serve swing mentally). As a result of practicing this visualisation, strengthening the neural pathways that regulate the muscles that are associated with your serve swing Saleh and Ata, (2008),(Weinberg & Gould, 2011). There is another point of concern with the psych neuromuscular theory, that is, the research implies cognitive processing instead of 40 neuromuscular feedbacks to be the more probable reason for the efficiency of mental preparedness and imagery. The research conducted by Ryan and Simons (1983) and the reviews of mental preparedness and imagery presented by driskell, Carolyn, and Moran (1994) Feltz and Landers (1983) indicate that visual imagery impacts or proves beneficial for the cognitive tasks more than the strength tasks (Morris, 2005). It has been observed that there has been a considerable improvement in athlete performance because of imagery that focuses on productive

responses, in contrast to the imagery that is based on stimulus physiognomies of the situation (Vealey, 2007).

2.11.3 Symbolic learning Theory.

Cognition has been the subject of focus in the symbolic learning theory presented by (Sackett 1934). Sackett asserted that imagery constitutes of rehearsal of the symbolic characteristics or aspects of tasks, such as sequences of activities involved (Hanrahan & Andersen, 2010). It was also mentioned that imagery can enable individuals understand their own movements better. According to the symbolic learning theory, imagery can function as a coding system that helps individuals gain a better understanding of their movement patterns. In other words, imagery enables individuals learn skills by becoming familiar or acquiring awareness of what needs to be done to achieve a successful performance. A mental blueprint is created for the successful execution and completion of a movement in the mind of the performer, when the performer forms a motor program in the central nervous system. For instance, in a doubles match in tennis, if a player is aware of his or her partner's movement for a specific shot, the player can plan her own course or movement patterns better (Weinberg & Gould, 2011). The different researches work carried out by Ryan and Simons (1983), Wrisberg and Ragsdale (1979), and Morris (2005) have reinforced the symbolic learning theory, where it is emphasised that mental rehearsal enables and supports cognitive performance more than motor performance. However, most of the sports skills involve both cognitive and motor components, and hence imagery can be impactful to an extent in enabling players acquire and perform a diverse range of skills. Johnson (1982) further asserted that visualisation of movements led to a bias in later performances when the player or performer concluded a visual-interference task. The observations and findings made in Johnson's study endorse the symbolic learning

theory as it is hypothesised that imagery of movements would be mainly visual (Schunk, 2014). Therefore, concluded that the relationship between human motor performance and mental imagery is evidently inseparable. The fundamental prerequisite for imagination to occur involves the capacity of human memory to store and project perceptions so that we can refer to them actively. The bio informational theory hypothesises that mental images are composed of propositional depictions of information stored in the long-term memory (Blumenstein & Orbach, 2012).

2.11.4 Attention and arousal set theory.

The attention and arousal set theory, as proposed by Janssen and Sheikh, (1994), aims to describe imagery rehearsal through the integration of physiological as well as cognitive components. According to the theory, imagery is an approach through which athletes can train and prepare themselves for a motor performance, both psychologically and physiologically. In the cognitive domain, it is implied that imagery can enable athletes to concentrate on task relevant prompts alone, as against irrelevant stimuli that can prove to be distracting and negatively impact the performance (Feltz & Landers, 1983). With the use of the mental imagery technique, athletes also enhance their attention to prompts for motor responses, reduce inhibitions to the motor action, and gain increased awareness of their physiological state (Feltz & Landers, 1983). As per the assumptions, peak performance is attained at an optimal state of arousal, and imagery can support and enable the athlete in his or her attempt to achieve that state of optimal arousal (Janssen & Sheikh, 1994).

The attention and arousal set theory brings together the physiological aspects of psych neuromuscular theory and the cognitive elements of the symbolic learning theory. As postulated by this theory, there are two ways in which the practice of imagery can help to improve performance. From the cognitive standpoint, imagery

may assist the athlete to selectively attend to the task at hand. When an athlete is focused on a task-relevant image, it is less likely for the athlete to be distracted by irrelevant stimuli. On the other hand, from a physiological perspective, imagery may enable the athlete to control the arousal level to achieve optimal performance.

2.11.5 Application of attention-arousal set theory in physical education studies.

As a result, it can be concluded that the attention and arousal set theory is very beneficial for sport studies and physical education. This theory asserts that physical education and intervention programs can drive the athlete's performance to greater levels. As mentioned by the attention-arousal set theory, there are two ways in which the imagery can improve performance. From the cognitive standpoint, imagery may assist the athlete to selectively attend to the task at hand. When an athlete is concentrating on a task-relevant image, it is less likely for the athlete to get affected or distracted by irrelevant stimuli. Several studies show that intervention programs can lead to considerable improvement in performance. On the other hand, from a physiological standpoint, imagery may enable the athlete to control the arousal level to achieve optimal performance (Afrouzeh & Sohrabi, 2013).

2.12 Long Jump Skill

In current times, the long jump is a common and popular event. In order to be good at long jump, one requires speed, skill, flexibility, strength and endurance. While it can possibly take several years to master all these elements, young athletes can acquire an accurate learning of the basic technique of the event at an early age (Maksoud, 1986).

Since the inception of modern athletics in the mid-nineteenth century, the fundamental technique used in long jump has not changed. The athlete sprints down a

runway or landing strip, jumps up from a wooden take-off board, bolts through the air, and lands in a pit of sand. Therefore, a successful long jump athlete needs to be a fast sprinter, have strength in legs to execute the jump, and be adequately coordinated and flexible to perform the relatively complex manoeuvres associated with the take-off, flight, and landing. The best men athletes in long jump (who are fast and strong) attain about 8.0–9.0 m of distances, while the best women athletes in long jump achieve distances of about 6.5–7.5 m. The main aim during each phase of the jump skill remains the same regardless of the ability, gender and the experience of the athlete. In order for the athlete to conduct the maximum jumping distance, he has to reach the very end of the run up to gain the highest horizontal velocity and the take-off foot must be placed accurately on the board of the take-off. The athlete is required to produce a high vertical momentum and not to sacrifice any horizontal velocity. During the phase of the flight, he has to maintain the rotation forward which is created during the take-off and align his body in a proper position preparing for the landing phase. At the landing phase, the athlete is required to pass the mark forward that was originally marked or made by his feet, without any reduction in the jumping distance or the back sitting.

2.12.1 Constituent elements of the long jump

The long jump event is composed of four continuous components or elements run-up, take-off, flight and the landing (Ibrahim, 2012). Every element requires dedicated attention and practice so that the athlete's full potential can be maximised. However, the fastest sprinter will not be able to win the long jump if the take-off action has not been adequately practised, developed or coordinated.

2.12.2 The run-up

According to Coyle (2001) the basic characteristics of a good run-up include rhythm, accuracy, and consistency. An effective run-up will help the athlete to gain or build up the required speed and attain a potentially effective take-off position. The long jump run-up requires being long enough to enable athletes to eventually build up an optimum speed (this is the fastest speed the athlete can attain without losing control during jump) that they can control during take-off. In general, an athlete who accelerates fast, such as a sprinter, will need a shorter run-up length than someone who takes longer to gain their optimum speed. The run-up may be too short if the athlete does not attain their optimum speed or 'stutter' (take short steps) during the course of the last few strides. The run-up should be shortened if the athlete reduces speed before the take-off board because this is normally caused when the athlete over-strides to the take-off board or attains the optimum speed very early. Athletes should figure out their own run-up distances. It needs to be considered that younger athletes will have shorter run-up distances than older (or even taller or faster) athletes. After establishing consistency, one should measure the run-up distance with a measuring tape. If there are no available tapes, measurement can be performed using the athletes' feet. They will begin from the middle of the square or the front of the take-off board (the side closes to the pit) and they will count the amount of foot lengths until their start mark is reached. The next competition or session can then use this distance as a starting point. One should remember that the run-up distance of an athlete can be altered by wind conditions, differences in track surfaces such as synthetic or grass, as well as running inconsistencies. If the athlete is situated in front of the wind, there may be a need to take the start back. On the other hand, if headwind is present, there

is a need to bring the start mark forwards. Running consistently helps the athlete achieve more accuracy.

The run-up consists of three phases.

1. The first or entry phase – as the athlete builds speed gradually, he/she develops a rhythm.
2. The central phase – rhythm and optimum speed are achieved by the athlete. During this phase, it is especially important during for the athlete to demonstrate good sprinting action. This happens when the head, shoulders, and hips of the athlete are aligned.
3. The preparation for take-off –the posture of the athlete during this phase becomes more upright. An increase in cadence (leg and arm speed) should also be present over the last 3–6 strides (Veassilios, 2007). The last (or take-off) stride needs to be fast. Furthermore, foot must not be stamped (should be flat) on the board (Luis & Eiberhrt, 2012).

2.12.3 The take-off

The take-off action takes the speed of the athlete during run-up and turns it into a vertical lift off the board. This action determines the flight path through the air of the athlete's centre of gravity. Main points in the take-off stage are:

A foot slightly in front of the body in a fast, firm flat footed plant. Stamping must be avoided on the take-off board since it will be counter-productive with the action of obtaining lift off the board.

1. The head, upper body, and hips must have vertical alignment. The take-off leg also needs to be fully extended at the hip, knee, and ankle. When in the take-off position, the athlete must not bend in the middle since the forward rotation of the body will be accelerated once it is in the air.

2. A powerful drive exists in the free knee to hip level. Bending of the free knee is done with the foot beneath the line of the knee instead of being in front of it. The hips will tend to drop if the free knee goes up higher than the hip level (or parallel). As a result, it is more difficult to have an effective lift off the Board. A leading foot (i.e. not directly beneath the knees)results in a slower and less efficient conversion of the horizontal speed built by the athletes during the run-up. The foot must be at right angles to the shin (dorsiflexed).
3. The free knee drive must be coordinated with a fast, sharp opposite arm drive (using the same arm as foot used for the take-off). The athlete should bend thearm at a 90 degree angle and stop it at forehead level (going any higher lessens the effectiveness).
4. The eyes of the athlete need to look straight ahead during take-off since this ensures the stability of the head.
5. A long last stride to the take-off board must be avoided by the athlete as this will only situate the body in an inefficient take-off position (similar for a stride that is too short). The last stride taken by the athlete must be fast and flat. HOW TO PALY ON THE LONG JUMP as PART OF YOUR LIFIN THE WAY

2.12.4 The flight

Daham (2011) states there are several different flight techniques that can be applied in the long jump. The sailing technique is performed by majority of untrained little athletes. One can easily adapt this to the more efficient stride jump, which is a predecessor of the hitch kick. The hitch kick and the stride jump both allow the athlete to take on a more efficient position in the air so that the forward rotational effects of the light can be retarded. The hang is another common technique. In this technique, the athlete needs to arch his/her back during the flight before forcefully thrusting his/her legs forward into the landing. One should note that the height reached by the

athlete during the flight is determined by the combination of the take-off position, run up speed, and actions. Once in the air, the athlete's flight path is predetermined.

2.12.5 Landing

The result of an efficient take-off is an efficient landing. Achieving the best landing position can be difficult if the athlete fails to get sufficient height during take-off. These are some of the main points during the landing phase: a. Landing is achieved with the feet together positioned in front of the body (Abd AL-Karim & Faisal, 2001). Upon contact, the knees bend. This makes it possible for the body to move past the foot marks. If the athlete performs poor extension before landing, it can be a result of the presence of forward rotational forces or having poor abdominal strength to sustain the jack-knife position. For landing, the most common technique is scoop through. In this technique, the athlete relaxes the knees during landing before scooping hips through so that the feet marks are cleared. Note that in the sail technique, the leg used for take-off is driven forward with the leading foot. This accelerates the effect of forward rotation and puts the body of the athlete into an early landing position. Development of the hitch kick is done from the stride jump, where another cycle is completed by the legs before landing is finished. The arms is synchronised with the legs during the cycle (Al-Tahi, 2016)

2.13 Rules of Long Jump Event

The rules of the event are helpful in making the athletes understand how to prevent fouls on their jumps. The following are the basic rules of long jump:

- The athletes should not take off in front of the line of the meter square or take-off board nearest to the pit. It is not a foul for the athletes to take off from behind the mat or board.

- During landing, the athlete is not allowed to put their hand or any body part outside the pit closer to the take-off area than the mark they made in the pit.
- Once the jump is complete, the athlete should not walk through the pit and head to the direction of the take-off area (athletes must always be encouraged to exit towards the back of the pit to exit). These are not the only rules for long jump but they are seen as the most vital ones for little athletes to know

2.14 The Related Studies

This part of the study includes the ideas, finished studies, generalization or conclusions and others. Those includes in this part helps in understand the information that are relevant and similar to the present study.

2.15 Mental imagery Studies

According to Willims (2017) mental imagery method has positive effect on heart rate and anxiety responses to a standard psychological stress task. In this study involve 25 female with (M_{age} = 23.24; SD = 4.19) imaged three different scripts (challenge, threat, and neutral) to manipulate appraisal of a speech preparation task.

Compere the present study with Sarah's study use mental imagery method to reduce the stress, however, the current study exam the effect of mental imagery on learning new skill. Moreover those studies have different in sample. Both studies use same quasi-experimental design.

The study by Rashad Tarik Yousef (2012) aimed to identify the impact of mental perception in the education of some types of scoring basketball. The finding of this study is statistically significant. True experimental method was used for the nature of the suitability of the research problem. Included the sample 30 students from the

first row average ages (12-13) Divided into two groups and by (15) students per group, the researcher also discussed the means, devices and tools used and steps to perform the search of the selection and to identify some types of scoring basketball and exploratory experiments, Tests, as well as tribal curriculum using mental visualization and then testing a posteriori as well as the use of certain statistical methods. Finding: The curriculum prepared according to methods used in the research has a positive effect and effective in the education of some types of scoring basketball.

The study of Marjorie (2010) which is titled Functions of mental imagery in expert golfers related to resent study in terms of exam mental imagery effect on sport activity. In this study, the researcher had examined the aspects and their use of the mental imagery and described the relation between the functions, the characteristics and the content of the mental imagery that are used by professional golfers. However, in the recent study the researcher the function of use imagery in learning new skill among beginners. Marjorie's study the method used the interviews with 21 expert golfers to collect data about their use of imagery. The resent study uses the quasi-experimental design to collect the data.

The study of Grotheer, Annette (2010) "Mental Imagery, observational learning and external focus in experts" the researcher tried to study if there were any possible benefit of the FOA (focus of attention) during the observational learning, the physical practice and the mental imagery. Utilizing the physical task of the full-body multiphase allowed the researcher to examine the sort of influence for each of these effects on the performance of the athlete. The experts in the long jump were the subjects of the study. The external and internal focus of the attention was compared by using the mix of factorial analyses of the variance. There was a different found reflecting the long distance jump for the internal focus of attention than the external

focus of attention. However, this effect was attributed for the unintended differences between the first and second group because of the difference in the level of expertise.

The data was normalized and corrected for this problem and there was no effect of the focus of attention. Although the focus of attention has not influenced the overall speed and distance, the external focus of attention produced a higher level pattern of improvement following the physical practice when it was compared to the internal focus of attention.

However, both of the analyses showed a significant effect of the condition, longer distance that is following the physical practice than following observational or mental practice.

Keywords: observational learning, focus of attention, expertise, mental imagery, athletic performance.

After reviewing this study find out that the focus of grotheer's study similar to the current study in term of benefits of mental imagery. However grotheer's study motley variables which is can't see this point in the current study

Overview of the study of Maryam, Janet ,Ebrahim (2016) the aim of this study was to evaluate the effectiveness of program design and the evaluation of training effectiveness of motor imagery to improve the motor skills of children with developmental coordination disorder.

In this study the used method was quasi experimental design. 16 children were selected to participate in the training program related to motor imagery after the necessary evaluation on children with developmental coordination disorder. The children motor skills were measured by Ossietzky Lincoln test before entering the training program. Motor imagery training program were taught to children with developmental coordination disorder during the eight sessions. Then, gross motor

skills of children were re-evaluated. The results showed that motor imagery caused a significant difference between pre-test and posttest groups in gross motor skills of children.

The aim of Maryam , Janet , Ebrahim (2016) study's similar to the current study which is evaluate the effectiveness of program design and the evaluation of training effectiveness of motor imagery to improve the motor skills. The methods used this this study was quasi experimental as well. However participate were selected to Maryam, Janet, Ebrahim (2016) study's is different in term of age and number.

Working memory and acquisition of implicit knowledge by imagery training, without actual task performance this study done by Helene and Xavier (2006). The researchers in this study have investigated learning of a skill called (mirror reading) by mental imagery training without using the actual performance of the task of mirror reading. During the experiment physically healthy volunteers was simulating writing on a screen that is transparent that was placed around eye level. The screen can be read by an examiner who is facing the subject. In order to perform this motor task that is irrelevant, the subjects were required to imagine the letters in an inverted way as if the letters seen in a mirror from the subject's own point of view (imagery training). The second group was performing the same imagery training that was associated with a more complicated secondary counting and spelling task. The controlled group simply had to write the words as the words would normally appear from the subject's point of view. The training included 300 words, all the subjects after that were tested in a mirror-reading task using sixty non-word constructed according to an acceptable combinations of letters using Portuguese language.

In the study of Maryam, Janet, and Ebrahim used the mental imagery on reading, however, in the resent study use mental imagery on motor skill. Both this

study and resent study use the mental imagery in learning process. Maryam, Janet, Ebrahim's study and the resent study both are using quasi experimental design.

Vorgelegt and Hegazy (2012) the effect of mental imagery on precision tasks in tennis and soccer. This study aimed to investigate whether mental imagery can improve the precision of two different closed skills which are the soccer penalty kick and the tennis serve. The research questions suggested the potential influence of the intervention of the mental imagery is fully dependent on the variables and their nature. The design of this study was experimental using pre-test and post-test and a controlled group. After collecting the data from the sample who are 60 subjects (22 females, 38 males) of beginner athletes with a reasonably high skill level at tennis, aged between 12 to 35 in Germany and a 54 male soccer athletes who are playing in a lower league. The analyses of the covariance showed that there is a significant effect of the precession of the tennis serve, while for the precision of the penalty kicking in soccer the effect of the mental imagery was only marginally significant.

The resent study applies the mantel imagery on school's students while the study above sample was athletes with a high skill. This study aimed to improve the skill of the athletes however the resent study aiming to teach new motor skill. Both studies use mantel imagery in motor skill developing.

2.16 Long Jump Studies

Hassan (2014) was his purpose of his study is to investigate the number of educational modules allocated to the activity of the long jump in raising the amount of applied and cognitive learning. An experimental research design was used in this research with pre-test and post-test for experimental group and control group each group has 8 students participated in the tests. Students in the control group were using the traditional learning approach. On the other hand, students in the experimental group were using the proposed tutorial using ultra-interference in the media to learn and retain the activity of the long jump. The finding of this research was that the prepared program achieved improvement in the level of technical performance and achievement in the long jump in the activity of the experimental group.. As noticed in the review of Hassan's study finding intersection points with current study are the research design and the research depend variables, while, the differences are the treatment and sample of the research.

Ibrahim (2012) aims in his study to detected values of some indicators bio kinetic of the research sample in the long jump at the first year university students. Detect stylistic differences between programmed instruction and learning approach. In this study used experimental design, and random sample. The finding of this study is curriculum using the method of programmed instruction is more effective than learning method approach in learning the technical performance and achievement of the effectiveness of the long jump. As noticed in the review of Ibrahim study intersection points are both studies work on how to develop the long jump skill for fresh students. This study used the experimental design, while the resent study uses quasi experimental design.

The study by Hussein Ali Jaafar (2012) aims to find out the effect of using the sequential method in learning and improving the performance of the two phases of the movement of walking during the flight phase of the long jump for the students. Know the differences in the impact of preference for the sequential method and the method used by other teachers to learn and improve the performance of the two phases of walking during the flight of the long.

The researcher used the experimental method for suitability of the research problem and research objectives. The sample of research is (12) students from fourth grade students of physical education. The finding conclusions are a clear improvement of the experimental group in kill's tests, while, the control group showed no significant differences in the level of development between the results of pretest and posttest in compared to the experimental group. Characterized by experimental and control group significant differences between the results of both tests of the experimental group in skill's tests used in the research. After reviewed this study find out that the methodology and the research field are match with the current research. On other hand, the research sample and the treatment used to solve the research problems are different.

Manipulating the attention that is directed for long jump athletes is to enhance their performance and to develop the coaching instruction. This theses is presented to the faculty of the graduate program in sport science and exercise 2014. The study's aim is to investigate the manipulation of the external focus of attention and how would it affect the long jump skill for a collage level students. The findings of this study suggested that performing the long jump skill could be enhanced if the subjects focuses on an external target high aboveground only if that target was self-selected by the athlete himself and not by the instructor. The researcher recommended that a similar research could be conducted on a higher sample of long jumpers.

This study is digging in developing the university student performance in long jump, however, the resent study work on teaching long jump skill for school's students. The resent study use mental imagery method and mental-physical method as treatment to compeer between them which method is more convene to teach the long jump skill in the schools.

The perfect angle to take-off in long jumping, Wakai (2005). This study aimed to identify the perfect take-off angle during standing long jump and to investigate the underlying biomechanics that can produce that perfect angle. The number of subjects were five who performed a maximal-effort in standing long jumps by using a wide range of angles to take-off, the flight and eventually landing. The variables from analysis video of the long jump. An observed decrease during the speed of the take-off by increasing the take-off angle was explained by a simple model of generating the force of the take-off phase. Both the take-off and the landing configuration of the subject were explained by a geometrical models.

In this study the researcher work on develop the long jump performance. Five participants chosen for this study as sample.

2.17 Retention Studies

The study by Hatam and Ariane (2015) aims to determine the impact of the use of accurate learning method and the curriculum followed in learning of some basic offensive skills in basketball and the extent of retaining those skills after a specified period of time of learning. an experimental research design was used in this research with pre-test and post-test for experimental group and control group each group has 56 participated in the tests. Students in the control group were using the traditional learning approach. On the other hand, students in the experimental group were using

the accurate Learning method. The finding of this research was the experimental group which used the accurate learning method had shown significant result comparing with the control group which used the traditional method. As noticed in the review of Hatam and Ariane (2015) study intersection points with my current study are the retention the researchers studied the effect of the use of accurate learning method and the curriculum followed in learning of some basic offensive skills in basketball the research design as well, the differences are the method of solving the problem and the sample.

The study by Iyad Ali Hussein and Hazem Mohammed Ali (2013), which titled "The impact of external feedback in learning and retention skills transmission and reception volleyball at middle school students age 12-13 years" this study aimed to investigate the effect of the external feedback during learning and retaining the skills for the transmitter and receiver of the ball and the plane touched for several researchers, including (SSI) feedback and the retention and forgetting including the importance of the feedback in learning and retaining these basic skills. The experimental method was used by the researchers and the sample was selected from the middle school students.

In conclusion, the researchers found that the external feedback has improved the performance, and that the learning process has a very positive role in the learning process, specifically during the early stages of learning.

In this study the researchers test the external feedback to see its effect on retention in the comparison with current research study the retention as well. The current research uses the mental imagery test on the retention. Also point of the differences is the research method and the sampling.

Ali Mohammed Khalaf, Habib Hussein Musleh and Omar Hamdi Abdel-Rahman (2013) which titled "The effect of using blooms model of command learning

in developing of learning and retention some basic skills in handball" aimed to identify the impact of the use of Bloom's model of learning in the development of learning some basic skills handball and return this learning. This study used the experimental method in manner equal groups with pretest and posttest. Choose the research group of third-grade students in the Faculty of Physical Education total 99 students and deliberate way that represent the research community. The research sample was selected randomly by lottery among the students, reaching the sample size of the group (33) students. The application modules apply on the experimental group of (36) educational units, including the introductory unit applied by three educational units per week. The results were processed by appropriate statistical method. The researchers concluded that the curriculum that has been entered on the experimental group was a major factor in the superiority of the experimental group in learning and retaining. After reviewed this study find out that the methodology and the research field are match with the current research. On other hand, the research sample and the method used to solve the research problems are different.

Effect of practicing soccer juggling with different sized balls upon performance, retention and transfer to ball reception, this study done (2014). A physicl education and sport science master theses. This study aimed to investigate whether increasing or decreasing the level of difficulty of the acquisition phase would enhance the level of transfer and the retention in performing juggling in soccer, and whether if this practice has any positive impact on the effect of the ball receiving performance.

The subjects were 22 adult soccer players (7 males, 15 females) with the age range of 16-19 years old who were tested in ball juggling for as many times as they possibly can within a time limit of 30 seconds where only the dominant foot to be used.

Furthermore, the skill to be performed within a restricted area to validate the test. The subjects after the pre-test were divided randomly into two equal size groups.

During the six weeks training period in a ratio of four sessions per week and 10 minutes per session, the first group practiced the ball juggling with a smaller sized ball than the balls that used in the test which would make the phase of acquisition more difficult, while the other group have practiced the ball juggling skill with a larger ball than the balls used in the test which made the phase of acquisition more easy.

The training of the ball receiving practiced during the training period. The retention test was conducted six to seven weeks after the post test to measure the consistency of the soccer ball juggling performance. The hypothesis suggested that the practicing of the of the ball juggling with a smaller sized ball might enhance the retention and transfer performance more as compared to practicing the juggling with a larger soccer ball. Furthermore, the hypothesis suggested that the practice of the soccer ball juggling would not have significant positive transfer of learning to performing the ball receiving skill.

The study's results showed that both of the groups has enhanced the transfer and the retention performance in the test of the ball juggling skill without a significant differences among the groups, which leads to rejecting the hypothesis that claims that practicing juggling with a smaller ball would be superior as compared to practicing the soccer ball juggling with a larger ball. The findings supports the hypothesis of the variability of practice. The researcher suggests that the number of the skill repetition is more important as a factor than the size of the ball that is used in practice during the acquisition phase. Furthermore, there was no positive transfer found to ball receiving skill performance that is supporting the specificity of the principle of learning.

A comparison of motor skill learning and retention in younger and older adults this study done by Sarah, Karen, Penhune (2009). The aim of this study was to investigate the short term retention and learning by using a modified sequenced reaction time type of task. A multi finger serial task was designed by the researcher for presenting a random and repeated sequence in completely interleaved way, giving subjects within block, variable practice on both types of sequences. The subjects were asked to respond using a piano keyboard to the visual stimulus that are appearing in one of four squares on the screen of the computer. The subjects were not informed that one of the presented sequences would be repeated. The sequence specific learning during one day, was inferred from the difference in accuracy and the retention time between random and repeated sequences. In sequence specific retention and learning, the age different was observed across the days, and it suggests that the older adults may benefit more from the variable practice.

2.18 Summary

This chapter reviewed the literature related to the objectives of the current study. It discussed the long jump skill in schools and the way mental imagery method work

Provide new learning method for student in physical education very important to improve the performance of the students.

CHAPTER 3: METHODOLOGY

3.1 Introduction

In this chapter, the method that is used in this study will be presented. It will also describe the nature of the subjects of this study, the used instruments, the type of the procedure used for gathering the data, and how this data will be statically treated. This study aims to exam the mental imagery method, mental-physical method on learning motor skills in physical education program and return the skill.

3.2 Populations and Sample

The study population consists of high school students from a school in Iraq and an intact sampling from the school has been adopted without alteration. The selection of intact sampling technique was done because of certain reasons, firstly, because of the current study design's nature, which is quasi-experimental. Thus, the selection of this sampling method is because the school serves as a good medium to easily apply the planned curriculum to perform the research. Furthermore, this sampling method allows researchers to determine the sample size quicker when compared to other methods.

The study sample from a school in Baghdad comprises 90 high school Iraqi students. The sample is segmented into three groups: experimental group one (N=30), experimental group two (N=30) and control group (N=30). The sample includes male school students only in Iraq, classified based on gender.

3.3 Research Design and Procedures

3.3.1 Research Design

This study used the quasi-experimental design to determine the effect of utilising mental imagery on the performance and the retention of this performance on the long jump skill. Quasi-experimental design involves choosing groups where a variable is tested despite the absence of any random pre-selection processes (Montero, 2012). The quasi-experimental design was selected for this study because an educational experiment is being performed. Thus, one might arbitrarily divide a class by seating arrangement or by alphabetical selection. Often, the division is convenient and leads to as little disruption as possible, especially in an educational situation. After the selection is complete, the quasi experiment takes place in a manner that is very similar to any other experiment, with the comparison of a variable between different groups. This study has three groups: experimental group one (n=30), experimental group two (N=30), and control group (n=30).

The control group will learn the long jump skill in six sessions once a week through the traditional method. The experimental group1 will learn long jump skill for six sessions once a week using mental imagery. Experimental group two will be taught the long jump skill through the combination of the practical (traditional) way and mental imagery technique.

Table 3.1 *Data Analysis Study*

Select Control Group	**Pre-test**	**No Treatment**	**Post-test 1**	**Free time (without training)**	**Post-test 2**
Select experimental Group	Pre-test	Experimental Treatment	Post-test 1	Free time (without training)	Post-test 2
Select experimental Group2	Pre-test	Experimental 2 Treatment	Post-test 1	Free time (without training	Post-test 2

3.4 Procedure of the Study

This study aims to determine how imagery affects long jump performance. Two treatment groups and a control group were included in the study. Each group started with thirty subjects, which generated total of 90 subjects for the whole study. For the two experimental and control group, the students received mental practice or a combination of both physical practice and mental imagery from the physical education teacher. Training was given to the school's physical education teacher on the intervention and the reason for applying it in the session. Every subject was given a pre-test and a post-test. Every group received a total of six contact sessions for their respective specific treatment. At the end of the sixth contact session, a post-test was given to the subjects in order to gauge their improvement in long jump performance with respect to the treatments. After two weeks of administering the post-test, all the groups went through another (post-test, 2) in order to gauge their retention of the skill. Data was subjected to statistical analysis tests, which includes ANCOVA, independent t-test, and Paired t-test.

The school's physical education teacher was trained by the researcher for one month. The training involved treatment for the three groups and the application of mental imagery, the traditional method, and the mental physical method. The physical education teacher was trained two times a week for one month.

The scientific study needs to take note of the choices of the population. Then, the convenience sample for the study was must be collected from this population. The most appropriate method to gather data from the sample must also be applied. Lastly, the right data analysis for the data will be gathered from the sample important stage in order to obtain clear answers for the research questions. This chapter will present a review of the sample included in this study, the method utilised for data gathering, and the treatment applied to address the study problem and perform data analyses.

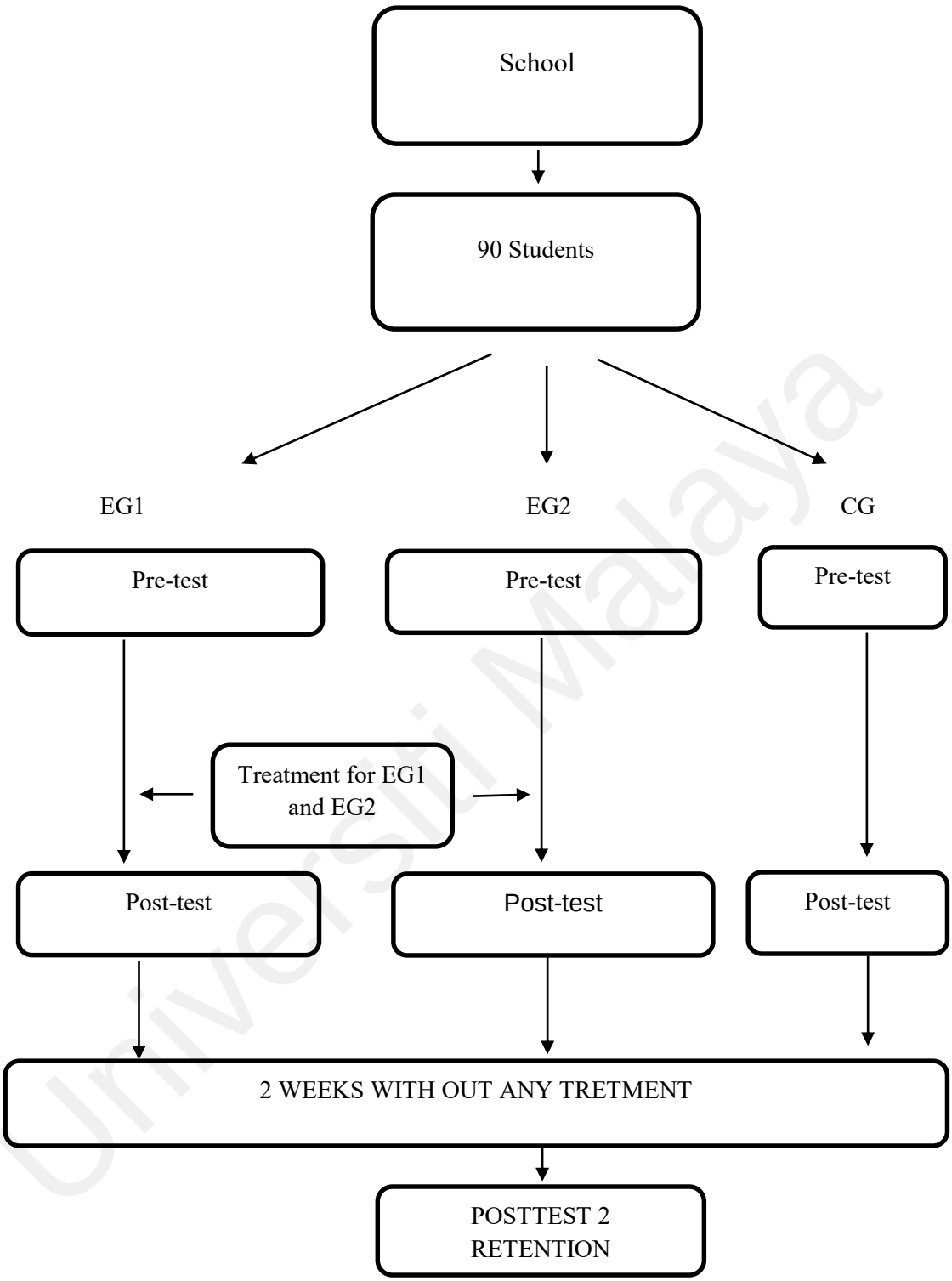

Figure 3.1 Quasi-experimental design (Creswell, 2012)

3.4.1 The physical education lesson program for the groups:

A. Program For experimental group one:

a. The school physical education program is considered for the experimental group that includes mental imagery program as intervention. The school physical education lesson is (45 min). The intervention program divides the lesson as explain below.

b. warm up (10 min): jogging (3 min), stretching (5 min), running (2 min)

c. Aerobic exercise (10 min): sit-up, sit and reach, pull up, Swedish swimming

d. Mental imagery session (15 min):First they were given the script to read and pictures to see regarding the long jump performance after which they were given time so that they can imagine the correct performance with regards to the skill.

e. Entertainment games (10 min): public secondary schools in Iraq are engaged in basketball, football, volleyball, where they play each game for two sessions.

3.4.2 Mental-physical learning methods group program

This measures the impact of integrating mental imagery on learning and retention when considering long jump skill. The intervention program includes 45 minutes of practice session, which is done once a week extending for six weeks. The program for experimental group to the mental - physical training program is integrated is provided below.

3.4.3 Objective

Students create mental images after they watch pictures regarding long jump performance, they are asked to recreate image in their mind regarding to the long jump performance, which they imagine themself doing the correct long jump performance as in the pictures they watched. This allows demonstrating the specific physical movement, since they get the time for practice the movement physically in the field.

Facilities and materials include stopwatch, whistle, measuring tape as well as a skill evaluation kit.

School physical education program (45 min)

A. Warm up (10 min): jogging (3 min); stretching (5 min); running (2 min)
B. Mental imagery session (15min): they are allowed to read the script and watch the pictures regarding the long jump performance and then given 1time to imagine the correct performance is given for the skill.
C. Movement rehearsing physically (10 min): they are given time to practice the movement physically in the field. The students follow the steps and practice the movement along with teacher's feedback.
D. Entertainment games (10 min): basketball, football, volleyball. They will play each game for 2 sessions.

3.4.4 Traditional learning group lesson program:

This measures the impact of employing mental imagery on retention and learning regarding long jump skills. Any special intervention given by the researcher is not included in the group of traditional learning method. However, for this group, the intervention program is kept for 45 minutes with regards to the normal physical education class assigned by the physical teacher, which is once a week continuing for 6 weeks. They also evaluate the long jump skills.

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3.5 The Interventions Programs

A. Mental imagery training program

For each of the six contact sessions, mental imagery training was provided to group one. A mixture of external and internal imagery was included in the mental imagery. The external imagery method involved a text and pictures to describe the long jump performance for the students. In the first contact session, subjects were asked to use proper techniques regarding imagery. The imagery procedures were implemented by all subjects for long jump performance on the very first day. In the imagery training, for each step of the skill, the students were allowed to read the text as well as watch the pictures.

B. Combined mental physical method

The mental imagery program aims to increase performance regarding long jump skill by segmenting the skill into parts so that each part can be visualised individually, after that they asked to imagine the whole skill. In the program content, the student uses mental imagery to practice long jump by reading the description regarding each part of the skill, which is supported by clear images showing the performance.

After gaining complete understanding regarding the skill, students were asked to sit and relax in a comfortable position without tension; they were asked to close their eyes to visualise the performance regarding the skill's first phase (approach) perfectly as demonstrated in the text.

The students attempt to visualise again with an additional focus. After completing the second time, students get ready for the first phase regarding the skill. This should give students time for their mental imagery training (watch the

performance image, read the text and visualise the performance). To correct their mistake, a comparison was made between the perfect performance and what they have performed. For the other three steps (flight through the air, take-off and landing) pertaining to the skill, the same application is implemented. Post completion of training on an individual basis for all the steps, the application is applied for the complete skills altogether.

C. Physical training program for control group

Physical practice for the long jump skill is provided for the control group. In this group, each subject performs 20 consecutive long jumps in each of the six contact sessions along with the instructions of the physical education teacher. At the same place, subjects would jump every day. Throughout the study, at no time, subjects were randomly given script or pictures regarding long jump skill so that they can understand the skills. Adhere to the employed method in the school, since this method does not employ any tools that would aid the student in understanding the movement. In the first contact session, subjects were asked not to practice the skill in the session time, which would likely produce a defect in the study.

3.6 Test

Long Jump Test, the test's objective is to determine the performance as well as achievement that would be beneficial for the learner. Two long jump experts with more than 10 years of experience in coaching were used to validate this test.

Test description: In the first stage (run-up): students run along the track with gradual increases in speed. In the second stage (take-off): students jump off from each mark (red line) without touching it. The third stage (flight): forth stage (landing)

Evaluations were completed by expert who gave scores (from 0 to 10) for all skill stages in order to evaluate skills performance (appendix 1). Physical education teachers measure the distance from each take-off line until the first sand mark made beach student, to record his achievement. Event rules are enforced to avoid fouls during the testing.

The fundamental rules of long jump are:

A- Trainees should not jump off in front of each line of the meter square or take-off board nearest each pit – if a trainee were to take off from before the mat or board, the attempt is not recorded as a foul.

B- During landings, trainees should not extend their hands or any other bodily parts outside each pit and closer to each take-off zone than the marks made within the pit.

C- Upon completing their jumps, trainees should not walk through each pit and towards the take-off zone (they must walk to the back of each pit to exit). It should be noted

3.7 Safety

A. Prior to practice sessions or lessons, the following safety guidelines must be observed:

B. Each pit with clean sand has been dug down at least 50 deep

C. No foreign objects are present and hidden, including glass, cans, stick, stones, etc.

D. The take-off zone is flat and flush with the surface of each run-up and must be able to take the force of athletic jumps.

E. Take-off boards must be firmly secured to avert movement during take-off from their surfaces, such that athletic shoes have grip and will not slip.

F. Run-up surfaces are flat, firm, and free of potholes, debris and movement from other subjects.

G. Shovels, rakes, and other gear should be placed face down and away from each landing zone so that subjects cannot trip over or stand on these when leaving each pit.

H. Subjects must wear athletic shoes that offer protective support, particularly for the heels.

I. Each trainee should be warmed up effectively with flexibility exercises prior to any activities.

J. Injured subjects must discontinue activities and seek medical care immediately.

3.8 Internal validity

Internal validity in investigative results gives researchers' confidence to decide that what was accomplished during the research had caused what was observed to occur, the outcome would represent results from treatments. Intrinsic validity only matters when a study attempts to associate causes with effects. Validity is established from both external and internal approaches. Either approaches important, although both are often opposed due to features of research design that infrequently increase internal validity. Proper sampling strategies with accurate measurements establish the validity of the final investigative results. In the resent study the researcher did steps to insure the validity of the study. A confounding variable is an extraneous variable that is statistically related to (or correlated with) the independent variable. The effects observed in the study were due to the manipulation of the independent variable and not due to another factor.

The sample group must be representative of the target population to ensure external validity.

3.9 Data collection

Data collection involves procedures for recording information based on target variables, using an established system of measurements that enables the researcher to address relevant questions while evaluating outcomes. Tools for collecting data can include questionnaires, interviews, observations, and readings. In our study, we chose to use evaluation forms (long-jump skill performance practical testing) which athletic coaches and other experts have already created for assessing and scoring students. The teachers observe trainee skills demonstrations and score the subjects based on their performances. The form comprises basic skills that each subject needs to master for him to pass. After the identification of all skills under observation based on relative importance as well as practical testing, the researcher used the evaluation forms for skills assessment, as recommended by expert trainers. Assessment values comprised 40 marks, including 10 marks for every partial movement. The assessment portion dedicated to research sampling comprised 90 students distributed across two experimental groups and a single control group.

3.10 Data analysis

Data analysis for the research involved the effects of using mental imagery practice on the acquisition of long-jump performance. All data collected on the control and experimental group performances is analysed through descriptive statistics, including mean and other inferential statistics acquired with ANCOVA, ANOVA, and multiple comparative testing. Analytical sections use ANCOVA to qualify the initial research

question in order to explain any meaningful effects observed from the use of traditional methods and mental imagery practice with regards to post-test mean scores.

Multiple comparative testing was utilised for determining which of the two modern methods had the greatest influence on learning long-jump skills. Lastly, ANOVA post-test two was utilised for determining statistically meaningful differences in the methods used in post-test. Furthermore, the assumptions of ANCOVA and ANOVA were relied on, including assumptions of homogeneity, normality, and regression slope. All statistical analyses were performed with the statistical package for social science (SPSS).

Table 3.2 *Data analysis of study*

No	Research questions	Statistical analysis
1	Does the combination of mental imagery, traditional method and mental-physical method have any impact on long jump skill?	One-way ANCOVA
2	Is there any impact of the mental imagery and traditional method on long jump skill?	One-way ANCOVA
3	Do mental imagery and mental-physical method cause any effect on long jump skill?	One-way ANCOVA
4	Is there any impact of the mental-physical method and traditional method on long jump skill?	One-way ANCOVA
5	Is there any difference of mental imagery, mental-physical method and traditional method on retention of long jump skill?	One-way ANOVA

3.11 Summary

This section describes the various investigative procedures used and all structures provided. It also covers explanations for the quantitative techniques employed, including population sampling, instruments, data recording procedures, as well as test procedures. Furthermore, it describes the training programme and methods applied in the exercises for mental imagery training as well as mental imagery/physical methods.

CHAPTER 4: RESULTS

4.1 Introduction

The main objective of this study is to examine the effect of intervention program mental imagery and mental-physical learning method on long jump skill performance among school students during 45 minutes of weekly lesson. The long jump skill evaluation form, which comprise each part of the skill score and the overall score for all the skill were used to obtain the required data for the analysis in this study these collected data were being used to analyze the effect of the mental imagery and mental-physical learning method exercises on long jump skills performance.

In this chapter the analysis of the data was by using ANCOVA to determine whether the mean of the post-test scores of students in long jump skill was different between the control group and the experimental groups after controlling for the pre-test scores. Prior to that, the test of assumptions was conducted skewness and kurtosis for normality and levene's test for homogeneity of variance. After the required assumptions were met the descriptive and inferential analysis on post-test scores and the test between subject's effects were conducted.

This quasi experimental design used 90 subjects from a school. The subjects were divided into three groups (control group and experimental groups) using intact sampling of 30 students each (N=30). The first experimental group mental imagery training the second experimental group went with mental - physical training third group control group used normal long jump lesson activities, for all groups go with 45min school lesson.

The analyzed data of mean scores in the level of long jump skills performance between control group and experimental groups were used to find out the effectiveness of an intervention program on the level long jump skills performance.

4.2 Demographic

Table 4.1 shows the three groups, experimental group 1 which consists of 30 student representing 33.3% percent from the total sample. Experimental group 2 which consists of 30 student representing 33.3% percent from the total sample and the control group consists from 30 students representing 33.3% percent from the total sample as well.

Table 4.1 *Group's subject's number and percentage*

Group	N	Percentage
Experimental One	30	33.3%
Experimental Two	30	33.3%
Control	30	33.3%

4.3 Result

ANCOVA used to explore the differences between three students' groups on long jump skill between experimental groups and control group by using mental imagery training and mantel physical training in learning long jump skill; while the Multiple Comparisons was used to measure the different in mean to compare between mantel imagery (experimental group one) and traditional learning method (control group), mental imagery-physical training method (experimental group two) and traditional learning method (control group) to find out which treatment has the higher influence on learning the skill. To measure the effect of mental imagery, mental physical method

and traditional throne retention the skill researcher run out the statistics test of ANOVA in SPSS software to prove if there are any effect of the treatments on the skill retention in experimental group one, experimental group two and control group. To get more understanding of the treatment effect on the retention the researcher run Multiple Comparisons test to discover which treatment are more success in keeping the skill for longer time. In order to use the ANCOVA need to test the assumptions of Independence, assumption of normality and assumption of homogeneity of variances (Levene's test) to insure the used data are testable.

4.4 The effect of mental imagery, mental physical method and traditional learning methods on long jump skill.

An analysis of covariance was used to access whether the experimental groups has higher scored in learning long jump skill by using mental imagery and mental physical method than the control group after controlling for differences between the experimental groups and control group in learning long jump skill.

Question1: Is there any effect of mental imagery, mental-physical method and traditional method on long jump skill?

Hypothesis1: There is significant effect of mental imagery, mental-physical method and traditional method on long jump skill

4.5 Testing the Assumptions of ANCOVA

The one-way ANCOVA is used to determine whether there are any significant differences between two or more independent (unrelated) groups on a dependent variable. As the researcher choose to analyses the research data using a one-way ANCOVA, part of the process involves checking to make sure that the data want to

be analyses can actually be analyzed using a one-way ANCOVA. Need to do the assumptions tests because it is only appropriate to use a one-way ANCOVA. The assumption tests of ANCOVA are assumption of in depending, assumption of normality, assumption of homogeneity and assumption of regression slopes.

Assumption of Independence, the assumption of independence means that data is not connected in any way (at least, in ways that have not accounted for in the model). There are actually two assumptions; the observations between groups which should be independent, which basically means the groups are made up of different people.

The observations within each group must be independent. If two or more data points in one group are connected in some way, this could also skew the data. The best way of ensuring that the observations are independent is the convenience sampling technique. For the purpose of independent the group's respondents came from three classes and were randomly assigned into two experimental groups and control group.

Assumption of normality, the ANCOVA test requires the assumption is 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 and Kurtosis values. Table 4.2 shows the skewness values and Kurtosis values for each construct.

Table 4.2 *Descriptive statistics of Assumption Normality Tests*

Groups	Test	skewness	Kurtosis
EG1	**Pre-test**	0.182	-0.522
	Post-test	-0.011	-0.613
EG2	**Pre –test**	0.280	- 0.559
	Post –test	.0434	-1.241
CG	**Pre-test**	-.039	-.946
	Post -test	-.008	- 0.859

The skewness value kurtosis ranging from negative 2 to positive 2 is considered normally distributed. The values of each construct were between -2 to +2, so the assumption of normality has been achieved. Kolmogorov Simonov was used to determine the normality of long jump skill. Results show that significant value of long jump skill is less than 0.05. Based on skewness and kurtsis were results showed that it is normal.

Assumption of homogeneity of variances (Levene's test), 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. Asserted that if the Levene's Test of Equality of Variance is not significant (p>.05), the two variances are approximately equal. Table 4.3 shows the result of Levene's Test of Equality of Variance.

Table 4.3 *Levene's Test of Equality of Error Variances of Experimental and Control Groups on the Post Tests on the Dependent Variable*

D.Variable	**F**	**DF1**	**DF2**	**Sig.**
Long Jump	.647	2	87	.411

From table 4.3, the *p* value of dependent variable was greater than .05 Martin and Bridgmon (2012) Therefore, it was concluded that the variances of long jump skill test were approximately equal and there was homogeneity of variances of the dependent variables across groups.

Analysis of ANCOVA is used to test the main and interaction effects of categorical variables on a continuous dependent variable, controlling for the effects of selected other continuous variables, which co-vary with the dependent. The control variables are called the "covariates.

Table 4.4 *Analysis of Covariance between mental imagery method, mental physical method and traditional learning methods for learning long jump Skill as a Function of Group, Using Pretest Scores on learning long jump Skill Test as a Covariate*

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
pre_test	315.344	1	315.344	47.283	.000	.355
Group	395.297	2	197.648	29.636	.000	.408
Error	573.556	86	6.669			
Total	69217.000	90				
Corrected Total	1374.322	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 long jump skill by using mental imagery

method and mental physical method and traditional method, [F (2.81) = 29.636, p< .05], partial eta squared = .408. The partial eta squared values of .209 means that 20.9% of the variance in learning long jump skill by using mental imagery method, mental physical method and traditional method. The value of partial eta ranging from .1 to .3 is regarded as small, those of .3 to .5 as a medium, and that .5 and over as large. Thus, the value of eta for the long jump skill test (eta = .209) is considered as a small effect size.

This result show us the experimental group one and two have higher increasing in their mean that mean the treatment of these groups are more effective to the students to learn the long jump skill. The mental imagery and physical mental imagery method are giving the students in the experimental groups more opportunity to understand the skill instead of just try to copy the instructor (skill model) movement. This understanding gives the students priority in learning the skill.

Tukey Post Hoc Test. The purpose of this test is to figure out which groups in the sample differ. It uses the "Honest Significant Difference," a number that represents the distance between groups, to compare every mean with every other mean.

Table 4.5 *Tukey Post Hoc Test*

Groups	EG1	EG2	CG
EG1	**-**	**-1.933**	3.666
EG2	**-**	**-**	5.600
CG	-3.666	-5.600	-

The table 4.5 shows comparing the measure of long jump skill to 3 groups of students ranked by degree as to how much they learned the skill from their treatment as control group experimental group one and experimental group tow. This analysis was found to be statistically significant, the strength of the development was found in the experimental group 2 which is 5.6 different in the mean from the control group. The students in experimental group 1 had some improvement as well different in the mean from the control group was 3.6.

Table 4.6 *Long Jump Skill Post-Test Descriptive Analyses*

Group	N	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Control group	30	24.690[a]	.474	23.748	25.632
EX group1	30	27.872[a]	.472	26.933	28.810
EX group 2	30	29.805[a]	.472	28.867	30.744

As shows in the table 4.6 the means and standard deviations for the experimental groups and control group on long jump skills, a difference existed between the experimental groups and control group on learning long jump skills by using mental imagery styles, mental physical and traditional learning method post-test two.

4.6 The effect of mental imagery method and traditional learning methods on long jump skill

Question 2: Is there any effect of mental imagery and traditional method on long jump skill?

Hypothesis 2: There is significant effect of mental imagery method and traditional method on long jump skill

Table 4.7 *Levene's Test of Equality of Error Variances of mental imagery method and traditional learning methods on the Post Tests on the Dependent Variable*

F	df1	df2	Sig.
3.653	1	58	.061

Table 4.7, shows the *p* value of dependent variable was greater than .05 (Martin & Bridgmon, 2012). Therefore, it was concluded that the variances of long jump skill test were approximately equal and there was homogeneity of variances of the dependent variables across groups.

Table 4.8 *Long Jump Skill Post-Test Descriptive Analyses*

Group	N	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Control group	30	24.600[a]	.486	23.628	25.572
Mental imagery Group	30	27.800[a]	.486	26.828	28.772

Recording the table 4.8 the means and standard deviations for the mental imagery group and traditional learning group on long jump skills, a difference existed between the mental imagery group and traditional learning group on learning long jump skills.

Table 4.9 *Analysis of Covariance between mental imagery method and traditional learning methods for learning long jump Skill as a Function of Group, Using Pretest Scores on learning long jump Skill Test as a Covariate.*

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
pre_test	174.457	1	174.457	24.893	.000	.304
Group	150.782	1	150.782	21.515	.000	.274
Error	399.476	57	7.008			
Total	41962.000	60				
Corrected Total	775.600	59				

As shows in Table 4.9, since the significance value for the experimental groups is .000, which is less than .05, there was a significant difference between the mental imagery group and control group on learning long jump skill by using mental imagery method and traditional method, [F (2.81) = 21.515, p< .05], partial eta squared = .274. The partial eta squared values of .274 means that 20.9% of the variance in learning long jump skill by using mental imagery method and traditional method. the value of partial 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 long jump skill test (eta = .274) is considered as a small effect size.

4.7 The effect of mental physical method and traditional learning methods on long jump skill

Question 3: Is there any effect of mental-physical method and traditional method on long jump skill?

Hypothesis 3: There is significant effect of mental-physical method and traditional method on long jump skill

Table 4.10 *Levene's Test of Equality of Error Variances of mental physical method and traditional learning methodson the Post Tests on the Dependent Variable*

F	df1	df2	Sig.
.227	1	58	.636

Table 4.10, shows the *p* value of dependent variable was greater than .05 (Martin & Bridgmon, 2012). Therefore, it was concluded that the variances of long jump skill test were approximately equal and there was homogeneity of variances of the dependent variables across groups.

Table 4.11 *Long Jump Skill Post-Test Descriptive Analyses*

Group	N	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Control group	30	24.660[a]	.424	23.810	25.509
EX group 2	30	29.674[a]	.424	28.824	30.524

Table 4.11 shows that the means and standard deviations for the mental physical method group and traditional learning group on long jump skills, a difference existed between the mental physical group and traditional learning group on learning long jump skills.

Table 4.12 *Analysis of Covariance between mental physical method and traditional learning methods for learning long jump Skill as a Function of Group, Using Pretest Scores on learning long jump Skill Test as a Covariate.*

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	302.613	1	302.613	56.495	.000	.498
Group	370.829	1	370.829	69.230	.000	.548
Error	305.320	57	5.356			
Total	45360.000	60				
Corrected Total	1078.333	59				

As shows in Table 4.12, since the significance value for the mental physical group is .000, which is less than .05, there was a significant difference between the mental physical group and traditional group on learning long jump skill by using mental physical method and traditional method, [F (2.81) = 69.230, p< .05], partial eta squared = .548. The partial eta squared values of .548 means that 20.9% of the variance in learning long jump skill by using mental imagery method and traditional method. The value of partial eta ranging from .1 to .3 is regarded as small, those of .3 to .5 as a medium, and that .5 and over as large. Thus, the value of eta for the long jump skill test (eta = .548) is considered as a large effect size

4.8 The effect of mental imagery method and mental physical method methods on long jump skill

Question 4: Is there any effect of mental imagery and mental-physical method on long jump skill?

Hypothesis 4: There is significant effect of mental imagery and mental-physical method on long jump skill

Table 4.13 *Levene's Test of Equality of Error Variances mental imagery method and mental physical method on the Post Tests on the Dependent Variable*

F	df1	df2	Sig.
1.477	1	58	.229

Table 4.13, shows the *p* value of dependent variable was greater than .05 (Martin & Bridgmon, 2012). Therefore, it was concluded that the variances of long jump skill test were approximately equal and there was homogeneity of variances of the dependent variables across groups.

Table 4.14 *Long Jump Skill Post-Test Descriptive Analyses*

Group	N	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
EX group1	30	28.033[a]	.500	27.032	29.034
EX group 2	30	29.967[a]	.500	28.966	30.968

Table 4.14 shows the means and standard deviations for the mental physical method group and mental imagery group on long jump skills, a difference existed between the mental physical group and traditional learning group on learning long jump skills.

Table 4.15 *Analysis of Covariance between mental imagery and mental physical method for learning long jump Skill as a Function of Group, Using Pretest Scores on learning long jump Skill Test as a Covariate*

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
pre_test	168.568	1	168.568	22.483	.000	.283
Group	56.067	1	56.067	7.478	.008	.116
Error	427.366	57	7.498			
Total	51112.000	60				
Corrected Total	652.000	59				

As shows in Table 4.15, since the significance value for the mental physical group is .000, which is less than .05, there was a significant difference between the mental physical group and mental imagery group on learning long jump skill by using mental physical method and mental imagery method, [F (2.81) = 7.478, p< .05], partial eta squared = .116. The partial eta squared value of .116 means that 10% of the variance in learning long jump skill by using mental imagery method and mantel physical method. the value of partial 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 long jump skill test (eta = .116) is considered as a small effect size

4.9 The effect of mental imagery method, mental physical method and traditional learning methods on retention long jump skill.

Question 5: Is there any effect of mental-physical method and traditional method on long jump skill?

Hypothesis 5: There is significant effect of mental-physical method and traditional method on long jump skill

Table 4.16 *Levene's Test of Equality of Error Variances of Experimental and Control Groups on the Post Tests on the Dependent Variable*

D.Variable	F	DF1	DF2	Sig.
Groups	.647	2	87	.411

From table 4.16, the *p* value of dependent variable was greater than .05. Therefore, it was concluded that the variances of long jump skill test were approximately equal and there was homogeneity of variances of the dependent variables across groups.

Table 4.17 *Descriptive statistics of Assumption Normality Tests*

Groups	Test	Skewness	Kurtosis
EXG ONE	**Post-test2**	-0.284	-1.253
EXG TWO	**Post-test2**	0.123	-0.553
CG	**Post-test2**	-0.010	0.184

Data were tested for normality as shows in the table 4.17, when the skewness and kurtosis value ranging from negative 2 to positive 2 is considered normally distributed. The values of each construct were between -2 to +2, so the assumption of normality has been achieved. kolmogorov Simonov was used to determine the normality of long jump skill. Results shows that significant value of long jump skill is less than 0.05. It is meant the long jump skill not normal. However, based on skewness and kurtsis were results showed it is normal

Table 4.18 *Retention Long Jump Skill Post-Test Descriptive Analyses*

Group	N	Mean	SD
EG1	30	28.033	3.112
EG2	30	29.966	3.295
CG	30	24.366	3.178
Total	90		

Table 4.18 presents the means and standard deviations for the experimental groups and control group on learning long jump skills, a difference existed between the experimental groups and control group on learning long jump skills by using mental imagery styles, mental physical method and traditional learning method posttest two.

4.9.1 One Way ANOVA.

The one-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of three or more independent (unrelated) groups. The one-way ANOVA compares the means between the groups you are interested in and determines whether any of those means are statistically significantly different from each other.

Table 4.19 *Analysis of Covariance for Learning long jump Skills a Function of Group, Using Pretest Scores on Learning long jump Skill*

Source	Sum of square	Df	Mean square	F	Sig.
Between Groups	568.267	2	284.133	33.686	.00
Within groups	733.833	87	8.435		
Total	1302.1	89			

Table 4.19 shows, there is statistically significant difference in the mean of the post-test score in long jump skill between experimental and control groups (f=33.686, sig=.000). Variance in post-test scores can be accounted for by the treatments in the experimental group. The conclusion of the data findings, reject the hypotheses null.

Having found statistically significant evidence that the mean number is not the same for all groups, the next step is to explore where the differences between groups are found. There are several possibilities, three groups might be similar, with just one group having a different mean, or there could be differences between all groups. If the ANOVA produces a statistically significant test, can carry out post hoc tests to see where differences between groups occur. SPSS provides a number of post hoc tests, here the test has been used with results shown below:

Table 4.20 *Multiple Comparisons between Three Groups on long jump Skill*

Groups	**EG1**	**EG2**	**CG**
EG1	-	-2.133	3.933
EG2	-	-	6.066
CG	-3.933	-6.066	-

With reference to table 4.20 a Multiple Comparisons was conducted to evaluate the effect of learning method (mental imagery & mental physical) on retention of long jump skill. There is a significant effect for mental imagery learning method (experimental group one) on long jump skill, the mental imagery learning method (experimental group one) significantly different = 3.9than the traditional learning method (control group), while the results indicated there is a significant effect for mental physical learning method (experimental group two) on long jump skill, the mental physical learning method (experimental group two) significantly different = 6.0 than the traditional learning method (control group). Finally, the results indicated

that also there is a significant effect for mental imagery learning method (experimental group one) on long jump skill than the mental physical learning method (experimental group two), (experimental group one) significantly different = -2.133 than (experimental group two).

In summary, learning method (mental imagery and mental physical method) showed a greater impact on students' in learning long jump skill. Students taught with learning method (mental imagery and mental-physical training) scored significantly higher than students undergoing the traditional teaching approach in these aspects. In addition, students were found to have large improvement in learning long jump skill) under the effect of learning method.

CHAPTER 5: DISCUSSION AND CONCLUSIONS

This section discusses conclusions regarding the research findings, with recommendations that reflect mental imagery practice and results. The aim of this research is to investigate the influence that mental imagery training may have on long-jump skill acquisition and retention, compared to the effects of traditional methods, on groups of secondary students. This research was conducted based on a quasi-experimental approach for investigating the effects of using mental imagery practice on long-jump skills acquisition among students. All pre-test and post-test control group methods applied in this research.

This chapter contains 3 sections. The initial section defines the research question, with the study's research implications also discussed. Lastly, this research provides suggestions for further investigation in this field.

5.1 Discussion

The aim of the research to establish the influence of mental imagery training on long-jump skill performance. This research comprised dual experimental groups plus a single control group. All groups began with subjects selected in accordance with convenient sampling, in a study that comprised 90 subjects in testing. Subject mortality was observed to be rather low, as only four students withdrew from this research. All groups received mental practice training group one, or physical-mental practice training group two, or physical training only control group. Pre-tests were given that comprised jumping along three consecutive trails, with the numbers attained and the resulting highest numbers recorded. All groups underwent six sessions subject to specific contact treatments. Subsequent to the conclusion of the final sixth contact

session, each student was given a post-test session similar to theoretician order to establish his level of improvement in long-jump skills training according to treatment.

Subjects in experimental group one received mental practice training that comprised mental imagery and relaxation exercises. Following the initial sessions, each succeeding mental practice session was five minutes in duration. The control group received physical training with contact that involved consecutive jumping during all five sessions. Experimental group two received physical-mental practice for all five sessions.

Once pre-test and post-test findings were recorded for all groups, data analysis was performed. The hypothesis was that the group using mental imagery experimental group one would not see improvement over the group using physical practice control group, whereas experimental group two would see improvement over the control group that used physical practice.

For testing these hypotheses, various statistical tools were used. ANCOVA analysis was applied for calculating the differences arising between the group using mental imagery experimental group one and the mental-physical practice group experimental group two and control group subjects. Analyses indicated that the group using mental-physical practice significantly improved in performances over control group subjects, as mentioned in the fourth chapter. As it was statistically meaningful, it could be said that the group using mental-physical practice produced greater improvement than either the control group or experimental group one.

One-way ANOVA analysis was used to establish which group gained the most retention. As hypothesised, the mental-physical practice experimental group two did not gain maximal levels of retention from the information given by treatments from experimental group one and the control group. Analyses indicated that the

mental/physical training experimental group two produced higher levels of skills retention over those of control group subjects, as mentioned in the fourth chapter.

Many models would describe how mental imagery training works in terms of how mental imagery training can affect motor-learning performance. The investigation applied the attention and arousal model set, since this model suggests that within the cognitive domain, conveyed mental imagery may help subjects emphasise task-relevant cues versus irrelevant stimuli, which can detract from actual performances (Deborah, 2007). Using this mental approach, subjects become aware of their individual physiological states, which reduce inhibitions regarding motor actions and improves awareness of cues for their bodily motor responses. Nonetheless, the basic weakness regarding the attention and arousal model set is that the theory cannot specifically describe how imagery can optimise arousal and attention.

Mental imagery effect: Motor learning and in particular early learning encompasses attempts by subjects to envision an idea of all movements required while understanding the basic patterns of coordination (Newell, 1985). Towards these goals, subjects should rely on cognitive and also verbal processes in order to hurdle challenges. The findings of the investigation on mental imagery were shown to not benefit all experimental groups equally. Analyses as indicated in Table 4 determined that the group using mental imagery experimental group one gained slight improvements in their performances when compared to control group subjects. The research results for mental imagery practice are supported by other studies on mental imagery practices used in various fields, with further reviews in some of these.

Grotheer (2010) Show that mental rehearsal has led to increased individual skills acquisition in term of transferability, accuracy, interference resistance, and task efficiency. By itself, mental imagery practice is thought to push the envelope of skills

learning in comparison with physical training. Through mental representations of tasks, individuals would activate several mental pathways that become accessible during actual performances of physical activities. Previous study (2010) demonstrated that mental imagery practice presents strong effects on memory and skills retention, which is clearly seen in our research findings, as described by the authors' observation that imagery practice resulted in proficient levels of skills performance.

As clearly seen in research by Grotheer and Annette (2010) similar results were seen even though later studies comprised different subjects with respect to the Garnet study regarding motor-learning performance among secondary school students, on whom the Grotheer and Annette,(2010) report focuses. This research examined the probable accumulative benefit of focus of attention (FOA) processes on mental imagery, observational learning, and physical training outcomes. The use of full-body multi-stage physical tasks enabled us to examine the influence of all these factors on athletic performances in general. Subject choice was expertly limited to selected long-jump tasks. External and internal foci of attention were compared based on a mixed factorial analysis of variance.

The good results that this research acquired from mental imagery practice are supported by theoretical models that assume mental imagery training positively affects performances. The outcome indicates that improvements in performances are possible with the method and this model attempts a description. Such explanation involves the suggestion that mental imagery sufficiently excites neuromuscular units to the point of inducing kinaesthetic imagery of actual movements. The envisioned events would induce changes in the synapses within the central nervous systems of the subjects performing such mental rehearsals.

Conversely, experimental group one (mental imagery) presented slight performance enhancements in comparison to the experimental control group. The best result this investigation obtained was with experimental group two (mental -physical training),which is clearly shown when comparing groups means in Table 4,as those for experimental group two increase with previous training. According to the findings regarding the given hypothesis, the following conclusion can be made regarding combinations of mental and physical practices which produced the most improvement within experimental group two. In comparison to the experimental control group, this group who trained using mental imagery achieved significantly enhanced performances.

Physical Training Effect: According to the researcher investigation, researcher understand that students trained in long jumps using physical training show enhanced performance scores over the pre-test, versus students trained with mental imagery techniques. Conversely, simple physical training practice does not assists well in skill retention as mental imagery. The results for post-test two show physical training with the lowest mean performance. Like outcomes were also recorded in earlier research carried out by Al-Ashker (2019) the numbers of educational modules assigned to long-jump activities towards improving mean levels of cognitive and applied learning. Control-group student members used traditional learning methods. Conversely, subjects within this experimental group applied the proposed tutorials with heavy media intervention in order to learn and retain long-jump activity. These findings indicate that preparatory programmes in high-overlap mode can attain encouraging enhancements in their technical performances of long jumps, within the activity of this experimental group, given that the preparatory programme attained in high-overlap mode is retained well by the subjects. Physical forms of training move

students into acquiring physical skills actual practice. Those students using this technique are reliant on feedback from their trainer. The issue with using conventional methods is that these students cannot retrain as well as they might be using other techniques at the time of training. Physical training or traditional approaches are reliant upon actual practice for attaining mastery of the skills required, which are limited by school lesson times and therefore the numbers of students not allowed enough time to pursue practice.

Mental-physical training method effect: The mental-physical training approaches reliant upon giving students time to realise skill concepts in long-jump performance. These mental imagery methods include the reading of texts on performing skills and the watching of performance content that visualises the skills needed for long-jump performance. The second stage of mental-physical training offers students opportunities for applying what they have retained from the first section of this activity.

The results for this study show that mental -physical training presents the best positive effects on long-jump skill retention and learning. This is clearly shown in the means reported for post-tests one and two, which indicates that the retention results for this technique are the highest among all three groups. Clearly, students within experimental group two had experienced the best positive effects of the two methods. The technique enabled those in experimental group two to achieve the best results in learning long-jump skills, among group campaign treatments regarding mental imagery as well as physical training techniques. Numerous researchers have confirmed that a reliance on physical practice blended with mental imagery does contribute to the optimisation of motor-skill performances, as Taktek and Rigal (2004) the effects of mental imagery on the learning and transfer of a discrete motor task by young children.

The outcomes show that performances of physical practice blended with mental imagery would beat times equivalent to, if not meaningfully better than, performances obtained using only physical practice methods.

Regarding the differences between mental physical and mental imagery approaches in long-jump skill learning, those regarding the imagery technique applied to experimental group1 and the mental physical technique applied to experimental group two may be divided based on certain criteria. Firstly, mental imagery practice emphasises the cognitive learning stages. With the initial motor-learning stage, the objective is to develop a general appreciation of physical skills in a subject. Student learners need to determine the skill objective involved while realising which environmental factors influence their ability to acquire physical skills. Teacher have to do their best to establish optimal learning settings, by removing major distractions where needed Neil and Campbell (2006) (Physical Therapy for Children).Conversely, the mental-physical training technique not only emphasises cognitive-stage learning, it also moves the process forward to the associative stage. Student learners begin to perform smoother movements through informed training. Once student learner has engaged in some practice and thereby experiences the varied physical stimuli that occur, the teacher can then emphasise the "how to" of the skills needed, going forward from the "which to do" of the first approach.

Secondly, among the more important goals of physical education is to teach students that physical activities can be a lot of fun, quality training by dedicated teachers assists students in developing basic motor-skill patterns of movement. The more the students believe physical fitness to be a part of everyday schedules, the more likely these students are to engage in fitness activities as they grow, resulting in healthier lifestyles. Youth who enjoy physical activities are those more likely to

become active. Clearly, mental imagery techniques miss this argument for physical education training within the school. Conversely, the mental imagery/physical training technique manages to address all these issues.

Lastly, statistical comparisons of students who trained in basic long-jump skills using the mental imagery methods show that they obtained fewer points than students who trained in basic long-jump skills using combined mental -physical training.

5.2 Implications of this study

The research is critical for it provides substantial evidence that modern learning methods can positively influence to a significant degree the educational levels of students attending secondary school. This situation is more salient among those training with advanced learning methods such as mental imagery, for they are motivated to acquire self-confidence with a greater sense of responsibility than those who learn through traditional methods. These findings could assist all involved to draw specific lessons, all while helping students and their teachers improve their awareness of the issues.

Implication for the teachers: The challenges of stimulating master levels of skilled performance have motivated teachers to apply different motor-learning methods in the training of students. Nonetheless, most learning methods only emphasise a single stage in the motor-learning process, i.e. cognitive, associative, or autonomous stage. Ignoring the first and/or second steps in the motor-learning process can destabilise the learning process. Our research attempts to emphasise the first two motor-learning stages equally in order to develop more effective physical education training. The research outcomes showed that students performed best when advanced

learning methods were applied. Therefore, trainers need to adapt their learning approaches and specific methods in order for all learning stages. Furthermore, it was shown that advanced learning methods provide a proper track for the pursuit of learning development by all students. Although students are taught different learning approaches, they will slowly learn to realise how modern learning methods can help them quickly acquire new skills, through a deeper understanding of skills-based requirements via mental -physical training.

Implication for students: The implications in this research derive from the advantages of mental imagery methods, which are widely applied in sports training to enhance performances. This brings forward the potential of applying such methodically in physical rehabilitation as well as motor-skill development. The use of mental imagery is seen to be beneficial for facilitating motor-learning tasks in students. As well, the research attempts to help students retain their motor skills for longer by showing them how to fully appreciate their motor skills over time.

5.3 Recommendations for further research

The research establishes certain insights into the results of applying mental imagery as well as combined mental imagery/physical training, towards the learning of long-jump skills. This study therefore presented certain proposals for additional studies. Such developments would help render more complete and reliable results in support of the efficiency of combined mental imagery as well as mental imagery/physical approaches in training for long-jump skills.

(i) In this study, students were trained using advanced learning methods, such as mental imagery as well as mental -physical training conducted over 8 weeks, in order to determine their effects on the learning of skills in long jumps. These trials

were conducted once per week for duration of about 45 min per session, at the school. According to this study, such advanced learning methods had positive effects on long-jump skill learning. Where training of advanced learning methods was not carried out over 8 weeks, a learning decline in long-jump skills was observed. Further study involved more contact in sessions.

(ii) This research involved 90 male students of 3 classes selected from the school, which is located in an urbanised area. Additional research should be conducted with more subjects from various areas, including rural or urban regions, to generalise the findings of this research.

(iii) In this research, implemented physical education sessions of 45 minutes in duration. Time limitations did not allow a research emphasis that involved relaxation. Additional research should be conducted into the use of normal training periods for teaching relaxation using mental imagery.

(iv) Our research comprised 90 male subjects without any female subjects involved. Additional research should involve subjects of both genders.

5.4 Contribution of study

Along with its practical implications, this study also adds to the existing literature. The research contributed to a better appreciation of how the initial learning stages of motor-skill learning may be better managed by teachers. Holistic analyses in this research further adds to current studies by identifying the relevance of mental practice in understanding motor skills and its effect on related learning and retention processes, in terms that should be applied in the initial learning stages. This research confirmed the findings of prior research that also emphasised the relevance of mental imagery in improving motor learning e.g. (Grotheer, 2010)"the practice of using mental imagery was found to strengthen critical images that enable greater skill acquisition and also

retention. Similarly showed that apart from increases in motor-skill performance, the use of mental imagery training can also lessen the effect off forgetfulness

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

5.5 Conclusions

In conclusions the study has sufficiently investigated the means by which advanced learning methods have affected the acquisition of skills in long jumps. The programme applied different teaching approaches that included modern as well as conventional styles in teaching-learning contact sessions. An experimental group consisting of students trained to use mental imagery as well as mental -physical training approaches was established, whereas the control group comprised subjects trained to use only conventional styles. Findings from this research suggest that advanced learning methods have a highly positive influence on long-jump skill learning. However, additional studies needs to be conducted on dissimilar age group samples with diverse advanced learning methods based on this research, towards obtaining further and significantly improved outcomes.

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