THE EFFECT OF VIRTUAL REALITY IMAGERY ON SPORTS IMAGERY, MOTIVATION, EMOTIONAL INTELLIGENCE AND EXPECTANCY-BELIEF AND VALUES ON FOOTBALL KICKING SKILL PERFORMANCE AMONG YOUTH FOOTBALL PLAYERS IN SARAWAK

CANDRAWATI BINTI IBRAHIM

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by

CANDRAWATI BINTI IBRAHIM

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LIST OF ABBREVIATIONS

AM	Amotivation
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CG	Control Group
CI	Confidence Intervals
CNV	Contingent Negative Variation
df	Degree of freedom
EI	Emotional Intelligence
EIS	Emotional Intelligence Scale
EIS-M	Emotional Intelligence Scale Malay Version
EPRD	Education Planning Policy and Research Division
EXP	Expectancy
EXT	External Regulation
FEVQ-PE	Expectancy-Value Questionnaire in Physical Education
FEVQ-PE-M	Expectancy-Value Questionnaire in Physical Education Malay Version
ICC	Intraclass Correlation Coefficient
IDT	Identified Regulation
IM	Intrinsic Motivation
ING	Integrated Regulation
IS	Imagery Script
ITJ	Introjected Regulation
NFI	Normative Fit Index

NNFI	Non-Normative Fit Index
PST	Psychological Skills Training
RMSEA	Root Mean Square Error of Approximation
SDT	Self-Determination Theory
SEM	Structural Equation Modelling
SI	Sport Imagery
SIAQ	Sports Imagery Ability Questionnaire
SIAQ-M	Sports Imagery Ability Questionnaire Malay Version
SMS-6	Sports Motivation Scale-6
SMS-6-M	Sports Motivation Scale-6 Malay Version
SPSS	Statistical Package for Social Sciences
SRMR	Standardized Root Mean Square Residual
TLI	Tucker-Lewis Index
USM	Universiti Sains Malaysia
VR	Virtual Reality
VRI	Virtual Reality Imagery

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KESAN IMAGERI REALITI MAYA TERHADAP IMAGERI SUKAN, MOTIVASI, KECERDASAN EMOSI DAN KEPERCAYAAN DAN NILAI HARAPAN TERHADAP PRESTASI KEMAHIRAN MENENDANG BOLA DALAM KALANGAN PEMAIN BOLA SEPAK REMAJA DI SARAWAK

ABSTRAK

Imageri adalah kaedah latihan kemahiran psikologi yang menggunakan semua deria untuk mencipta semula pengalaman, yang secara efektif meningkatkan prestasi atlet, terutamanya dalam bola sepak. Kajian ini mengkaji kesan imageri realiti maya terhadap imageri sukan, motivasi, kecerdasan emosi, dan kepercayaan dan nilai harapan terhadap kemahiran menendang bola sepak dalam kalangan pemain muda di Sarawak. Fasa 1 melibatkan pengesahan versi Melayu dari Soal Selidik Keupayaan Imejan Sukan (SIAQ- M), Skala Motivasi Sukan-6 (SMS-6-M), Skala Kecerdasan Emosi (EIS-M), dan Soal Selidik Jangkaan-Nilai dalam Pendidikan Jasmani (FEVQ-PE-M). Seramai 321 guru pelatih lelaki mengambil bahagian dengan purata umur 20.13 tahun. Analisis faktor pengesahan dan alfa Cronbach digunakan untuk penilaian kebolehpercayaan dan kesahan. Indeks kesesuaian SIAQ-M ialah RMSEA = 0.071, CFI = 0.969, TLI = 0.960, SRMR = 0.08, dengan nilai Kebolehpercayaan Komposit (CR) antara 0.796 hingga 0.885 dan kebolehpercayaan ujian-semula ICC = 0.996-1.000. SMS-6-M menunjukkan kesesuaian dengan RMSEA = 0.065, CFI = 0.924, TLI = 0.912, SRMR = 0.052, dan alfa Cronbach α = 0.929, dengan kebolehpercayaan ujian-semula ICC=0.987-1.000. EIS-M menunjukkan indeks kesesuaian RMSEA = 0.083, CFI = 0.904, TLI = 0.893, SRMR = 0.08, dengan alfa Cronbach α = 0.955, dan ICC = 0.989-0.999. FEVQ-PE-M

menunjukkan RMSEA = 0.854, CFI = 0.966, TLI = 0.958, SRMR = 0.081, dengan alfa Cronbach α = 0.923, dan ICC=0.993-1.000. Fasa 1 juga menggunakan Pemodelan Persamaan Berstruktur (SEM) untuk menganalisis hubungan, menunjukkan korelasi positif yang signifikan antara pembolehubah kajian. Fasa 2 mengkaji kesan imageri realiti maya terhadap pembolehubah ini dan prestasi menendang bola sepak dalam kalangan pemain muda. Keputusan menunjukkan perubahan yang signifikan dari masa ke masa dan antara kumpulan untuk Imageri Sukan, $F(1, 57) = 56.54$, $p < .001$, ηp2 = .498, Motivasi, $F(1, 57) = 64.40$, $p < .001$, ηp2 = .530), Kecerdasan Emosi, $F(1, 57) = 10.21$, $p < .001$, ηp2 = .264), dan Kepercayaan Dan Nilai Harapan, $F(1, 57) = 9.92$, $p < .001$, ηp2= .163). Perbandingan kumpulan menunjukkan perbezaan yang signifikan antara Imageri Realiti Maya (VRI) dan Skrip Imageri (IS), VRI dan Kumpulan Kawalan (CG), tetapi tidak antara IS dan CG, kecuali untuk SMS-6-M ($p = .112$). Kajian ini menyimpulkan bahawa SIAQ-M, SMS-6-M, EIS-M, dan FEVQ-PE-M adalah boleh dipercayai dan sah digunakan untuk pemain bola sepak muda di Sarawak. SEM menunjukkan bahawa imejan realiti maya mempengaruhi secara positif imageri sukan, motivasi, kecerdasan emosi, dan kepercayaan dan nilai harapan. Program intervensi imageri realiti maya selama 12 minggu disarankan untuk institusi pendidikan dan bola sepak bagi meningkatkan kemahiran bola sepak dalam kalangan pemain muda di Sarawak, menyumbang kepada peningkatan prestasi jangka panjang.

THE EFFECT OF VIRTUAL REALITY IMAGERY ON SPORTS IMAGERY, MOTIVATION, EMOTIONAL INTELLIGENCE AND EXPECTANCY-BELIEF AND VALUES ON FOOTBALL KICKING SKILL PERFORMANCE AMONG YOUTH FOOTBALL PLAYERS IN SARAWAK

ABSTRACT

Imagery, a psychological skills training method, enhances athletic performance, particularly in football. This study examines the impact of virtual reality imagery on sports imagery, motivation, emotional intelligence, and belief-values regarding football kicking skills among youth players in Sarawak. Phase 1 involved validating the Malay versions of the Sports Imagery Ability Questionnaire (SIAQ-M), Sports Motivation Scale-6 (SMS-6-M), Emotional Intelligence Scale (EIS-M), and Expectancy-Value Questionnaire in Physical Education (FEVQ-PE-M). A total of 321 male trainee teachers participated, with a mean age of 20.13 years. Confirmatory factor analysis and composite reliability (CR) were used for reliability and validity assessment. The SIAQ-M displayed an acceptable fit (RMSEA = 0.071, CFI = 0.969, TLI = 0.960, SRMR = 0.08), with a Composite Reliability (CR) values range from 0.796 to 0.885 and test-retest reliability of ICC = 0.996-1.000. The SMS-6-M showed a fit with RMSEA = 0.065, CFI = 0.924, TLI = 0.912, SRMR = 0.052, and a Cronbach's alpha of $\alpha = 0.929$, with test-retest reliability of ICC = 0.987-1.000. The EIS-M demonstrated fit indices of RMSEA = 0.083, CFI = 0.904, TLI = 0.893, SRMR = 0.08, with a Cronbach's alpha of $\alpha = 0.955$, and ICC = 0.989-0.999. The FEVQ-PE-M showed RMSEA = 0.854, CFI = 0.966, TLI = 0.958, SRMR = 0.081, with $\alpha = 0.923$, and ICC = 0.993-1.000. Phase 1 also utilised Structural Equation Modelling (SEM)

to analyse relationships, revealing significant positive association among the study variables. Phase 2 investigated the effect of virtual reality imagery on these variables and football kicking performance among youth players. Results indicated significant changes over time and between groups for Sports Imagery, $F(1, 57) = 56.54$, $p < .001$, $\eta p2 = .498$, Motivation, $F(1, 57) = 64.40$, $p < .001$, $\eta p2 = .530$, Emotional Intelligence, $F(1, 57) = 10.21$, $p < .001$, $\eta p2 = .264$), and Expectancy-Belief and Values, $F(1, 57) = 9.92$, $p < .001$, $\eta p2 = .163$. Group comparisons indicated significant differences between Virtual Reality Imagery (VRI) and Imagery Script (IS), VRI and Control Group (CG), but not between IS and CG, except for the SMS-6-M ($p = .112$). The study concludes that the SIAQ-M, SMS-6-M, EIS-M, and FEVQ-PE-M are reliable and valid for youth football players in Sarawak. SEM revealed that virtual reality imagery positively influenced sports imagery, motivation, emotional intelligence, and expectancy-belief and values. A 12-week virtual reality imagery intervention program is recommended for educational and football institutions to enhance football skills among youth players in Sarawak, contributing to long-term performance improvements.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Malaysia leverages sports as a key instrument for national development, aiming to foster unity, develop human capital, and achieve international recognition. Through various government programs and initiatives, the country focuses on developing athletic talent, improving infrastructure, and creating an environment where athletes can excel. The regulation of sports is designed to maximize achievements and promote participation across all demographics, with institutional leaders spearheading policies that support athletes' progression to high-performance levels (Khan, 2014). Ultimately, these coordinated efforts are intended to contribute to the nation's overall growth, showcase its capabilities on a global stage, and support broader economic development.

To become a professional athlete, a systematic training program must address physical, technical, and psychological aspects, with the psychological component being as vital as the others (Supriatna & Hanief, 2022). A key psychological training method is imagery training, which involves an athlete mentally recreating a sensory experience of a performance or skill (Maciel et al., 2021). The effectiveness of this training relies on the athlete's ability to create vivid, lifelike mental images by engaging all senses (Kehoe & Rice, 2016). This mental rehearsal, which can be conscious or subconscious, allows athletes to visualize themselves performing tasks or movements without physical execution, a practice shown to significantly improve performance in motor tasks (Di Corrado et al., 2014; 2019). Consequently, much of the research in this field focuses on an athlete's ability to generate high-quality imagery.

Elite athletic performance relies heavily on an athlete's ability to perceive, anticipate, and execute skills under time pressure. In response, modern sports training is increasingly focused on developing visual-perceptual and visual-motor skills, with a growing interest in new technologies to gain a competitive advantage (Teng et al., 2021). Virtual reality (VR) technology offers a promising solution to this challenge by providing an innovative and engaging approach to training. Unlike traditional methods, VR can bypass the brain's predictive coding to create a powerful sense of presence, immersing athletes in realistic, dynamic environments (Riva et al., 2019). This allows them to practice and perfect their imagery skills with a level of realism and engagement that was previously unattainable, thereby accelerating their development and enhancing their on-field performance.

Motivation is a crucial driver of an athlete's commitment and effort (Padilla et al., 2021). Through immersive VR experiences, athletes can visualize success, which can enhance their intrinsic motivation, fueling their perseverance in training and competition. Furthermore, emotional intelligence is essential for managing stress, maintaining focus, and fostering positive team relationships (Tran et al., 2020). VR imagery training can improve an athlete's emotional intelligence by allowing them to practice coping strategies and emotion regulation in realistic, simulated scenarios. In addition, the technology impacts an athlete's expectancy-values-belief by building confidence, reinforcing positive self-talk, and strengthening their belief in the importance of their goals (Tóth-Király et al., 2021). By immersing athletes in environments where they can experience success and overcome challenges, VR can reshape their beliefs about what they are capable of achieving, thereby enhancing their overall performance and resilience on the field (Chesham et al., 2021).

Sarawak is Malaysia's largest state, encompassing 124,449.51 square kilometers, which is 37.5% of the country's total area. Its projected population of over 2.9 million people includes a diverse mix of major ethnic groups such as the Iban, Chinese, Malay, Bidayuh, Orang Ulu, and Melanau, as well as smaller communities like Indians and Eurasians (Department of Statistics Malaysia, 2021). Football, the world's most popular sport with over 250 million registered players (FIFA, 2022), mirrors its global passion in Malaysia, where it is also the most popular sport (Ahmad, 2021; Aman et al., 2024). Governed by the Football Association of Malaysia, the sport's widespread popularity and minimal equipment needs make it highly accessible, contributing to its development since the establishment of modern regulations in 1921.

Malaysia, once a regional football powerhouse, has seen a decline in its national team's performance since the 1990s. To regain its former standing and earn international respect, like that of nations such as Japan and South Korea, Malaysia should look to the success of countries like Thailand. Thailand's "Gajah Perang" team, for example, achieved success in the 2018 World Cup and 2019 Asian Cup qualifiers, largely due to a highly efficient nine-year football development program (Berita Harian Online, 2016). Recognizing that youth are a vital component of society (Biddle, 1997), Malaysia's Ministry of Education (MOE) has taken a proactive role in addressing this decline. The MOE has established a nationwide network of training centers and sports schools, providing young players with structured training, resources, and year-round competitions to identify and develop talent. This strategic pathway is crucial for nurturing future national players and is a key step toward returning Malaysian football to its former glory.

The Sarawak State Schools Sports Council (MSSN) works with the District Schools Sports Council (MSSD) and school sports managers to plan and oversee school-level sports competitions. This is part of a national effort to elevate football to an international standard. In Sarawak, the state football association and the Sarawak State Sports Council (MSNS) conduct talent identification programs for teenage footballers, using a series of tests to measure key factors for success in the sport, as described by Balyi & Hamilton (1995). The state government and sports schools also play a crucial role by providing structured programs and a pathway for these young athletes. Sports schools in Sarawak select and train the best young talents, focusing on developing their technical skills, physical fitness, tactical understanding, and psychological factors like confidence and resilience to prepare them for competitive play at the state and national levels.

In Western sports, there is a growing recognition that athletic success is not solely the result of physiological or biomechanical factors but is also critically dependent on psychological aspects. This awareness has led to an increased emphasis on integrating sports psychology into training, a practice that is now widely acknowledged by athletes, coaches, and sports organizations as a key to achieving success (*Institut Sukan Negara Malaysia*, 2015). For instance, research in football has shown that psychological training, in addition to physical drills, can improve overall performance and reduce the risk of injury (Marcello et al., 2009). This shift highlights the vital role of psychological skills in modern, high-level sports.

1.2 Background of Study

Sport psychology is of great importance in enhancing performance in sports. The statement supported by Yongtawee et al. (2022) by stating that successful performance in sports depends on two of three major components, namely psychological readiness, and motor skills (Yongtawee et al., 2022). Imagery is one of the psychological skills training (PST) that uses both the mind and the body where it involves the process of creating or re-creating one's experience by using all the human senses. Imagery is a powerful technique for enhancing sports performance. For the last few years, imagery has always been the subject of great research. The findings consistently encourage us to believe that effective visualisation methods have such a significant and meaningful impact on sports performance. We enable our athletes to psychologically experience a variety of competing situations by practicing these methods, so that when the time comes, they will just be prepared to perform better. Although the explanation for this would be unexplained, imagery often predicts behaviour. Such as at work, in relationships, or in sports, imagining disaster or success typically leads to that event. Taking control of our imaginations is critical if we are to effectively manage our behaviour, especially in football.

However, more studies are needed to understand the mechanism of imagery to rips more benefits from the imagery training. One such method could be using virtual reality. Meanwhile, over the past few years, many sports scientists have developed new systems that use technology to improve the performance of athletes. One of the technologies used in virtual reality (VR) headsets. Virtual Reality is created by Jaron Lanier in 1989. Lanier was one of the settlers in this field, founded the company VPL Research (from “Virtual Programming Languages”) which created the first part of the system in 1980. Virtual Reality (VR) is the use of computer technology to create a simulated environment. VR

places the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds. By simulating as many senses as possible, such as vision, hearing, touch, even smell, the computer is transformed into a gatekeeper to this artificial world.

The only limits to near-real VR experiences are the availability of content and cheap computing power. In Virtual Reality, the computer uses similar sensors and math. However, rather than locating a real camera within a physical environment, the position of the user's eyes is located within the simulated environment. If the user's head turns, the graphics react accordingly. Rather than compositing virtual objects and a real scene, VR technology creates a convincing, interactive world for the user success in sport is often associated with vigour and anger. Importantly, emotionally intelligent people can get themselves into the appropriate emotional states for the demands of the situation. If the situation requires high arousal, emotionally intelligent people are good at getting themselves psyched up and prepared. Equally, if the situation requires calmness, emotionally intelligent people are excellent at relaxing themselves.

Research looking at the nature of emotional intelligence has found that emotionally intelligent people use psychological skills such as imagery more often than their less emotionally intelligent counter parts. It was found that emotionally intelligent people are mentally tough and that they find exercise enjoyable. Importantly, it seems that emotional intelligence can be enhanced through suitably developed intervention packages.

1.3 Statement of Problem and Rationale of Study

Football is a complex sport where success depends on a combination of psychological abilities and technical skills, with kicking being one of the most vital. As a fundamental skill, kicking is essential for everything from making passes to scoring goals (Bacvarevic et al., 2012; Rada et al., 2019). Despite its importance, kicking is considered one of the most difficult skills to master, requiring a high degree of control and concentration to ensure accuracy. The issue of inaccurate passes is particularly relevant in Malaysian football, where it has been identified as a factor hindering team performance, as noted during a match against Saudi Arabia in the 2018 World Cup qualifying campaign (Berita Harian Online, 2016). This highlights the critical need for players to develop and refine their kicking ability to achieve a higher level of play.

Kicking is the most important skill in the game of football. There are many other skills but without kicking no team can play a winning game. The significance of kicking ability in football cannot be overstated, as highlighted by Bacvarevic et al. (2012). This skill extends beyond passes, crosses, and clearances, playing a crucial role in scoring goals and ultimately enhancing the prospects of winning game. The goal is scored when the ball passes beyond the goalkeeper and the goal line within the goal area. There are different types of kicks in the game of football. Some of them are as follows In-step Kick, In-side Step Kick, and Out-step Kick. In-step Kick is the most powerful kick among all. Benneth et al. (2016) stated by the instep kick is an important technique in football for generating maximum ball speed, which combined with accuracy, can help successfully score a goal. Successful kicks need to be fast and accurate, especially when kicking for shooting a goal (Deros et al., 2012).

Research on the expectancy-belief and values of youth athletes is crucial for enhancing skill performance and maintaining sports involvement. In football, a key skill is kicking, which is vital for everything from accurate passing to scoring goals. The ability to kick effectively is a primary determinant of a team's efficiency and a major factor in winning games (Silva et al., 2013). Studies have consistently shown that positive expectancy-beliefs and high subjective task value can significantly increase players' engagement, performance, and achievement in sports (Gao, 2007; Kanagarajah et al., 2020). Therefore, understanding these psychological factors is essential for improving both individual kicking skills and overall team success.

Football in Sarawak has a rich history with strong community support and past successes. This study is crucial for understanding the motivations of the state's youth football players. By measuring their current motivation levels, researchers can effectively implement virtual reality (VR) interventions to improve high-level kicking skills. The study's focus is on examining the roles of motivation, emotional intelligence, and expectancy-belief and values in enhancing performance. It also explores how these psychological factors, along with VR imagery, can be used to help young players reach their full potential.

Virtual reality (VR) offers a promising alternative to traditional, script-based imagery training for enhancing football kicking skills. By providing an immersive and interactive environment, VR allows players to realistically visualize and simulate game scenarios, which can improve skill acquisition and performance (Fiorilli et al., 2021; Gómez & Fernández, 2022). In a controlled VR setting, players can practice and refine their kicking technique, observe their form, and receive real-time feedback. This immersive experience helps to enhance muscle memory and overall kicking proficiency.

Despite these potential benefits, the specific application of VR for imagery training in football remains an under-researched area. This study aims to address this gap by systematically investigating the effects of a VR imagery intervention on the sports imagery, motivation, emotional intelligence, and expectancy-belief and values of youth football players in Sarawak, as well as its impact on their kicking skill performance.

1.4 Operational Definition

To ensure clarity and coherence for readers, this study provides precise definitions of key terms used throughout the research. These definitions are tailored to the context of the study and are consistently applied to enhance comprehension. These operational definitions also help researcher to be more focus and consistently in the right direction during literature review process. The following terms are defined as follows:

1.4.1 Youth

In the context of this study, “youth” refers to individuals aged between 18 and 23 years. This age range is chosen to correspond with the transitional phase from adolescence to young adulthood, aligning with the specific focus of the research. It's important to note that while definitions of youth may vary across organisations and countries, for the purposes of this study, individuals within the age range of 18 to 23 will be considered youth.

1.4.2 Performance

Performance in football is a multifaceted construct encompassing biomechanical function, emotional factors, and training techniques. It is the measure by which football participation is evaluated, reflecting players' abilities to execute skills effectively,

contribute to team success, and achieve individual and collective goals.

1.4.3 Football

Football, also known as association football or soccer, is a team sport where two teams of 11 players each compete to score goals by moving the ball into the opposing team's goal. It is played predominantly with the feet, although other body parts except the hands and arms can also be used and is characterised by its dynamic and strategic nature.

1.4.4 Kicking

Kicking in football involves a forward and sideward swing of the leg opposite to the kicking foot, with the non-kicking foot placed beside the ball. It is a fundamental skill in football, crucial for making passes and scoring goals. Kicking requires coordination, technique, and whole-body movement, making it one of the most challenging skills to master in the sport.

1.4.5 Convenience Sampling

Convenience sampling, also known as Haphazard Sampling or Accidental Sampling, is a nonprobability sampling method where members of the target population are included based on practical criteria such as accessibility, availability, or willingness to participate. While convenient, this sampling approach may introduce biases and limitations that should be considered in the interpretation of results.

1.4.6 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) is a statistical technique, specifically a type of Structural Equation Modelling, used to examine the relationships between observed variables (e.g., test scores, social perception appraisals) and latent variables or factors.

CFA focuses on testing hypotheses about the underlying structure of data, aiming to validate theoretical models and assess the fit between observed and expected relationships.

1.4.7 Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) is a comprehensive statistical method that integrates factor analysis and regression analysis to analyse the structural relationships between measured variables and latent constructs. SEM allows researchers to examine complex networks of relationships among variables, making it particularly useful for understanding the interplay between psychological constructs such as sports imagery, motivation, emotional intelligence, and expectancy beliefs.

1.4.8 Imagery vs. Mental Imagery

In sport psychology, imagery is a skills training technique that uses the senses to create or re-create experiences in the mind, while mental imagery refers specifically to the cognitive process of mentally rehearsing actions without physical execution; in this thesis, *imagery* is used for training and measurement, and *mental imagery* highlights the underlying cognitive process (Morris et al., 2005; Weinberg & Gould, 2015; MacIntyre et al., 2013; Moran, 2016).

1.5 Research Questions

Phase 1:

1. Are the translated Malay versions of the Sport Imagery Ability Questionnaire (SIAQ), Sports Motivation Scale-6 (SMS-6), Emotional Intelligence Scale (EIS), and French Expectancy-Value Questionnaire in Physical Education (FEVQ-PE)

valid and reliable to measure sport imagery, sport motivation, emotional intelligence and expectancy value among university students?

2. Is there an inter-relationship between sports imagery, motivation, emotional intelligence, and expectancy-belief and values on kicking skills performance among youth football players in Sarawak?

Phase 2:

3. Are there effects of virtual reality imagery on sports imagery by groups on football kicking skill performance among youth football players in Sarawak?
4. Are there effects of virtual reality imagery on motivation by groups on football kicking skill performance among youth football players in Sarawak?
5. Are there effects of virtual reality imagery on emotional intelligence by groups on football kicking skill performance among youth football players in Sarawak?
6. Are there effects of virtual reality imagery on expectancy-belief and values by groups on football kicking skill performance among youth football players in Sarawak?

1.6 Research Objectives

The general objective of this study is to investigate the relationship and effect of virtual reality imagery on sports imagery, motivation, emotional intelligence, and expectancy-belief and values and football kicking skill performance among youth football players in Sarawak. The specific objectives of this study are to:

Phase 1:

1. To examine the validity and reliability of the translated Malay versions questionnaire Sport Imagery Ability Questionnaire (SIAQ), Sports Motivation Scale-6 (SMS-6),

Emotional Intelligence Scale (EIS), and French Expectancy-Value Questionnaire in Physical Education (FEVQ-PE) among university students using confirmatory factor analysis and internal consistency reliability.

2. To investigate the relationship between sports imagery, motivation, emotional intelligence, and expectancy-belief and values on kicking skills performance among youth football players in Sarawak by using Structural Equation Modelling (SEM).

Phase 2:

3. To examine the effects of virtual reality imagery on sports imagery by groups on football kicking skill performance among youth football players in Sarawak?
4. To examine the effects of virtual reality imagery on motivation by groups on football kicking skill performance among youth football players in Sarawak?
5. To examine the effects of virtual reality imagery on emotional intelligence by groups on football kicking skill performance among youth football players in Sarawak?
6. To examine the effects of virtual reality imagery on expectancy-belief and values by groups on football kicking skill performance among youth football players in Sarawak

1.7 Research Hypothesis

Operationally, this study tests the following null hypotheses at the $\alpha = 0.05$ significance level:

Phase 1:

1.7.1 **Ho1**: The Malay translated questionnaires (SIAQ, SMS-6, EIS, and FEVQ-PE) are not valid and reliable among university students.

Ha1: The Malay translated questionnaires (SIAQ, SMS-6, EIS, and FEVQ-PE) is valid and reliable among university students.

1.7.2 **Ho2**: There are no significant relationships between sports imagery, motivation, emotional intelligence, and expectancy and values on kicking skills performance among youth football players in Sarawak.

Ha2: There are significant relationship between on sports imagery, motivation, emotional intelligence, and expectancy and values on kicking skills performance among youth football players in Sarawak.

Phase 2:

1.7.3 **Ho3:** There are no significant effects of virtual reality on sports imagery by groups on football kicking skill performance among youth football players in Sarawak.

Ha3: There are significant effects of virtual reality on sports imagery by groups on football kicking skill performance among youth football players in Sarawak.

1.7.4 **Ho4:** There are no significant effects of virtual reality on motivation by groups on football kicking skill performance among youth football players in Sarawak.

Ho4: There are significant effects of virtual reality on motivation by groups on football kicking skill performance among youth football players in Sarawak.

1.7.5 **Ho5:** There are no significant effects of virtual reality on emotional intelligence by groups on football kicking skill performance among youth football players in Sarawak.

Ha5: There are significant effects of virtual reality on emotional intelligence by groups on football kicking skill performance among youth football players in Sarawak.

1.7.6 **Ho6:** There are no significant effects of virtual reality on expectancy-belief and values by groups on football kicking skill performance among youth football players in Sarawak.

Ha6: There are significant effects of virtual reality on expectancy-belief and values by groups on football kicking skill performance among youth football players in Sarawak.

1.8 Chapter Summary

In short, this chapter gives an overview of the research topic, the intention, and the reason for the researcher to conduct the study. Chapter 2, which is the literature review, will delve deeper into the existing knowledge and research on the topic. It will examine relevant studies, theories, and concepts that have been explored by other researchers. The literature review aims to provide a comprehensive understanding of the current state of knowledge and identify any gaps or areas for further investigation.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter 2 presents the literature review of the study, which includes a theoretical, practical, and review of previous findings. The purpose of this chapter is to provide readers with an understanding of the existing knowledge and research relevant to the study. It aims to highlight the significance of the research and identify gaps or areas for further exploration. The literature review serves as a foundation for the study, helping to establish the theoretical framework and contextualise the research questions or hypotheses. By examining previous studies and theories, this chapter contributes to the overall understanding of the research topic and provides a basis for the subsequent chapters.

2.2 Virtual Reality (VR) device and Sport Performance

Virtual reality (VR) technology has emerged as a promising tool in enhancing sport performance. Its immersive nature allows athletes to experience realistic and simulated environments, providing opportunities for skill acquisition, effective training, and psychological benefits.

One area where VR has shown potential is in skill acquisition. VR provides a controlled and repeatable environment for athletes to practice and refine their skills. Studies have demonstrated that VR training can improve athletes' motor skills, such as hand-eye coordination, reaction time, and spatial awareness (Donohue et al., 2018). VR

simulations can mimic real-game scenarios, allowing athletes to train in a safe and controlled setting before transferring their skills to actual competitive settings.

VR has also been found to enhance training effectiveness. By creating immersive and engaging environments, VR training can increase athletes' motivation and engagement during practice sessions. VR simulations can be tailored to specific training objectives, providing interactive and personalized training experiences (Steed et al., 2016). This targeted training can lead to improved performance outcomes and skill development.

Moreover, VR has psychological benefits for athletes. It can be used as a tool for mental imagery and visualization, allowing athletes to mentally rehearse their performances and improve their confidence and focus. VR can also be used for stress and anxiety management, as it provides a controlled environment for athletes to experience high-pressure situations and learn coping strategies (Makransky & Petersen, 2019). By exposing athletes to realistic and challenging scenarios in a virtual setting, VR can help them develop resilience and mental toughness.

While VR shows promise in enhancing sport performance, there are still areas for further exploration. Future research can investigate the optimal design and implementation of VR training protocols, including factors such as dosage, duration, and frequency of VR sessions. Additionally, studies can focus on the transferability of skills learned in VR environments to real-game situations, as well as the long-term effects of VR training on performance outcomes.

2.2.1 Skills Acquisition

Studies have demonstrated that VR training programs can effectively improve the skills of athletes. Research by Neumann et al. (2018), Durkalec-Michalski et al. (2019), and Bedir & Erhan (2021) had shown positive outcomes in skill acquisition through VR interventions. VR provides a simulated environment that allows athletes to practice specific movements and decision-making skills, leading to enhanced performance in sports such as basketball, tennis, and golf.

2.2.2 Training Effectiveness

The use of VR in sports training has been shown to enhance training effectiveness. VR enables athletes and coaches to observe and analyse performance from different perspectives, improving learning and retention abilities (Ross-Stewart et al., 2018). Bideau et al. (2010) highlights the three-step process of VR implementation in sports, including capturing athletes' motion, adapting virtual humanoids to specific constraints, and presenting the virtual environment. Studies have shown the effectiveness of VR in enhancing sport-specific decision-making in rugby, football, and swimming (Fels et al., 2005; Petit & Ripoll, 2008; Watson et al., 2011).

2.2.3 Psychological Benefits

In addition to physical training, VR can also offer psychological benefits in sports performance. Stinson et al. (2013) suggest that VR can be utilized for sports imagery, allowing athletes to simulate environments and scenarios to enhance their performance. VR can provide relaxation and cognitive therapies, enabling athletes to focus on mental preparation and visualization techniques. However, research exploring the psychological

benefits of immersive VR experiences in sports, particularly for individuals with limited internal imagery skills, is limited.

2.2.4 Future Directions

While Virtual Reality (VR) has demonstrated considerable promise in enhancing sport performance, several areas warrant further exploration to fully realise its potential. Future research should focus on investigating the feasibility and mechanics of skill acquisition and performance enhancement through VR technologies. Specifically, studies are needed to evaluate how VR can be effectively integrated into training regimens to improve technique and tactical skills (Smith & Roberts, 2023).

Moreover, the psychological benefits of VR for athletes, such as stress reduction and cognitive training, represent an intriguing area for further study. Recent research has begun to explore how VR can help in managing performance anxiety and improving mental resilience (Johnson & Clark, 2022). Understanding these psychological impacts is crucial for developing VR applications that not only enhance physical skills but also support athletes' mental well-being.

Additionally, exploring the optimal utilization of VR in various sports contexts is essential. This includes identifying best practices for VR implementation, considering factors like the type of sport, the skill level of the athletes, and the specific training goals (Brown & Lee, 2024). Further research should also assess the long-term effects of VR training on athletes' performance and well-being, including potential benefits and any adverse effects that might arise from extensive VR use (Wang et al., 2021).

In conclusion, while VR has shown significant potential in improving sport performance through skill acquisition, training effectiveness, and psychological benefits, there remains a need for more comprehensive research. This research should aim to optimize VR applications in sports and deepen our understanding of its impact on athletes' performance and overall well-being.

2.3 Imagery and Sport Performance

Imagery is a powerful cognitive tool that enhances sport performance by allowing athletes to mentally simulate sensory experiences and create vivid, realistic mental scenarios. The effectiveness of imagery is contingent on the level of sensory detail and realism achieved. In sports, imagery is employed to improve skill acquisition, enhance performance, and address psychological aspects, making it an essential technique in the field of sports psychology. The comprehensive and immersive nature of imagery ensures its continued relevance and effectiveness in helping athletes achieve their full potential.

2.3.1 The Nature and Process of Imagery

Imagery is a sophisticated cognitive process involving the retrieval and manipulation of stored perceptual information from memory to generate rich, vivid mental experiences. It allows individuals to simulate sensory experiences and create detailed, realistic stimuli in the mind, thereby facilitating mental rehearsal, learning, and performance across various domains, including sports, education, and creative endeavours.

According to research by Salmon et al. (1994), Suinn (1985) and Vangyn et al. (1990), imagery encompasses the ability to mentally simulate a wide range of sensory

experiences. This includes not only visual images but also auditory, tactile, olfactory, and gustatory sensations. When individuals engage in imagery, they can vividly imagine and experience situations as if they were perceiving them through their senses, making the process a comprehensive simulation of reality.

2.3.2 Sensory Detail and Realism in Imagery

The effectiveness of imagery is closely tied to the degree of sensory detail and realism that can be generated in the mind. Studies by Boccia et al. (2019), Farah (1993), and Kosslyn (1980) have emphasised the brain's capacity to create complex and sophisticated mental experiences. Immersing oneself fully in the imagined situation using all sensory modalities leads to a more immersive and engaging experience. This multisensory approach enhances the vividness and realism of the imagery, making it more impactful for the individual.

Researchers such as Kehoe and Rice (2016), Roure et al. (1999), and Morris et al. (2005) have stressed the importance of generating clear, sharp, and vivid mental images for effective imagery. The clarity and detail of the imagined scenario directly influences the realism and effectiveness of the imagery experience. The more detailed and well-imagined the situation, the more likely it is to produce beneficial effects on performance.

2.3.3 Imagery in Sports Psychology

Imagery is a widely studied topic in sports psychology due to its potential to enhance various aspects of sport performance. It is used as a technique to improve skill acquisition, enhance performance, and address psychological aspects in sports. This section of the literature review focuses on the role of imagery in these areas.

2.3.4 Skill Acquisition

Imagery can play a crucial role in skill acquisition by allowing athletes to mentally rehearse and practice their skills. Mental rehearsal through imagery helps in reinforcing the neural pathways associated with specific motor skills, thereby aiding in the learning process. Athletes can use imagery to visualize the correct execution of skills, which can lead to improved muscle memory and coordination when performing the skills in real-life scenarios.

Recent studies, such as those by Smith et al. (2020) and Taylor et al. (2021), have shown that imagery can significantly enhance the learning and refinement of motor skills, providing evidence that mental practice can be as effective as physical practice in some cases. These studies highlight that mental imagery not only aids in the physical replication of skills but also enhances the cognitive processes involved in skill acquisition.

Imagery has been recognised as an effective cognitive process for improving learning and performance of motor skills (Parnabas et al., 2015). Athletes can use imagery to mentally rehearse specific sporting skills and plan strategies before competitions. By creating or recreating experiences in the mind using all senses, athletes can enhance their cognitive understanding of movements and improve the execution of skills (Arjeria & Kumar, 2015). Mental practice through imagery allows athletes to mentally repeat actions or skills, leading to increased confidence and focus (Amasiatu, 2013).

Additionally, a recent review by Callow et al. (2017) supports the notion that mental imagery contributes to better motor skill performance by enhancing the cognitive and neural representations of the skills being practiced. This is particularly beneficial in

sports where precise timing and coordination are essential, as imagery can help athletes anticipate and react more effectively during competition.

Furthermore, the integration of imagery with physical practice, known as the “dual coding” approach, has been shown to optimise skill acquisition. According to Wright and Smith (2022), combining physical practice with imagery leads to superior performance outcomes compared to physical practice alone. This dual approach leverages the benefits of both mental and physical rehearsal, ensuring a more comprehensive and effective learning process.

2.3.5 Performance Enhancement

Imagery has been shown to enhance performance by helping athletes prepare mentally for competitions. By visualizing successful performance and positive outcomes, athletes can boost their confidence and reduce anxiety. This mental preparation can translate into better focus, composure, and execution during actual performances. The ability to simulate various competitive scenarios and outcomes through imagery allows athletes to be better prepared for different situations they might encounter.

Studies by Johnson et al. (2022) and Williams and Cumming (2023) indicate that athletes who regularly use imagery report higher levels of performance and lower levels of pre-competition anxiety, underscoring the technique's effectiveness in competitive settings.

Imagery has been widely used by coaches and athletes to improve sports performance. It can alter the psychological state of an athlete and facilitate the development of mental processes, technical skills, learning strategies, and tactical layouts

(Ribeiro et al., 2015; Munroe et al., 2000; Williams & Cumming, 2012). By incorporating all senses and creating vivid mental images, athletes can enhance the physical nature of imagery and improve the transfer of skills from imagination to actual performance (Afrouzeh et al., 2013). Studies have shown that imagery can have an ergogenic effect on motor performance, contributing to improved overall athletic performance (Wakefield & Smith, 2009). Recent studies have reinforced these findings. For instance, Zhang et al. (2020) demonstrated that imagery training improved both the psychological and physical aspects of performance in elite athletes. Similarly, Brown and Fletcher (2021) found that imagery interventions significantly reduced anxiety and increased self-confidence among competitive athletes.

2.3.6 Psychological Aspects

The psychological benefits of imagery in sports include enhanced motivation, focus, and emotional regulation. By engaging in imagery, athletes can mentally rehearse coping strategies for dealing with stress and pressure. This mental rehearsal can help in developing a positive mindset and improving overall mental resilience. Furthermore, imagery can be used to reinforce positive self-talk and goal setting, contributing to better psychological well-being and performance.

Recent findings by Green et al. (2019) and Parker and Lovell (2020) highlight the role of imagery in fostering psychological resilience and enhancing mental toughness among athletes, suggesting that it is a valuable tool for mental conditioning. In addition to skill acquisition and performance enhancement, imagery can have psychological benefits for athletes. It can help athletes overcome mental obstacles that hinder