UTS UNIVERSITY OF TECHNOLOGY SYDNEY

A Model for the Delivery of Taekwondo Education for Officials in the Oceania Region

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Doctor of Philosophy in Information Systems

under the supervision of Dr Kyeong Kang, Dr Valerie Gay and Dr Alan Sixsmith

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Certificate of Original Authorship

I, Rene Raymond Leveaux, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Engineering and Information Technology at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

Signature:

Date: 1 August 2023

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Capstone Editing provided copyediting and proofreading services, according to the guidelines laid out in the university-endorsed national 'Guidelines for Editing Research Theses'.

Dedication

This thesis is dedicated to my mother (Margo) and father (Jean)

who always wanted a 'doctor' in the family,

and to HE … just because

Publications Emanating From This Work

Leveaux, R. & Kang, K. (2021). Referee and coach education in sports: Case of Taekwondo with focus on the Oceania region. *Journal of e-Learning and Higher Education*, *2021*. https://doi.org/10.5171/2021.606594

Leveaux, R. & Kang, K. (2019). *An examination of the delivery of sports Taekwondo referee and coach education with emphasis towards the Oceania region* [Paper presentation]. 34th International Business Information Management Association Conference, Madrid, Spain.

Leveaux, R., Gallagher, S., Sixsmith, A. & Simpson, H. (2019). Classroom evolution: The swing towards blended and flipped learning. *Journal of e-Learning and Higher Education*, *2019*. https://doi.org/10.5171/2019.560996

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Gallagher, S., Sixsmith, A., Leveaux, R. R. & Simpson H. (2017). Transitioning the classroom: The shift towards blended and flipped learning. In K. Soliman (Ed.), *Vision 2020: Sustainable economic development, innovation management and global growth – Proceedings of the 30th International Business Information Management Association Conference* (pp. 4581–4592). IBIMA. https://opus.lib.uts.edu.au/handle/10453/127700

Other preceding works and publications by the author may be found in Appendix L

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Glossary

ATU	Asian Taekwondo Union
AFTU	African Taekwondo Union
CSB	Competition Supervisory Board
Dan	Belt (grade) level of a black belt practitioner (from 1st Dan to 9th Dan)
Daedo	A brand of PSS approved by WT
Dartfish	The provider of the video review system used in WT competitions
Deuk Jeom	A point scored in a Taekwondo match
Dobok	Uniform worn when practising or competing in Taekwondo
Dojang	Training hall or club used to practise Taekwondo
Gup	Belt level of student prior to black belt
Gam Jeom	A penalty in which the opponent is awarded a point
Hanmedang	An event comprising of Poomsae, Hosinsul and Kyukpa
IDP	Industry Doctorate Program
IR	International Referee
ITF	International Taekwondo Federation
Hogue	Chest protector, though also can include head gear and additional body protection
Hosinsul	The art of self-defence
KP&P	A brand of PSS approved by WT
Kyukpa	The art of breaking
Kyorugi	The term for fighting and/or sparring
LMS	Learning Management System

MNA	Member National Association
MOOC	Mass Open Online Course
OTU	Oceania Taekwondo Union
PATU	Pan American Taekwondo Union
Poomsae	A set sequence of strikes and blocks in a predetermined pattern
PSS	Protection Scoring System (aka 'Protective Scoring System' or 'Protector and Scoring Systems')
UTS	University of Technology Sydney
WTF	World Taekwondo Federation (pre-June 2017)
WT	World Taekwondo (June 2017 onwards)

Abstract

Taekwondo is a martial art recognised and practised globally. The sport of Taekwondo has evolved from the martial art, is practised in over 210 countries and is contested at the highest sporting levels, including the Olympic Games. Increasing demands accompanying the growing popularity of the sport have led to frequent changes to the sport's rules and conduct; this has necessitated continual development of and access to comprehensive educational programs for all stakeholders involved in the sport. The sport now requires highly skilled and knowledgeable officials, especially in refereeing and coaching.

This thesis resulted from an industry-based project support by the Oceania Taekwondo Union and presents a model for the delivery of education on Taekwondo competition in the Oceania region. This thesis reviewed prior literature on e-learning, blended learning, and cultural aspects and issues in relation to the sport in the Oceania region. This review identified that Taekwondo education in Oceania faces unique challenges, including geographical dispersion of the regional body's member countries, cultural diversity, and limited access to funding and educational resources.

This project commenced with a comprehensive review of Taekwondo education across the Oceania region to understand the key challenges and gaps. This review was then expanded to the educational offerings in the other four Taekwondo regions and offerings by the Taekwondo world body. The organisational structures of the sport and the martial art were examined to understand the key challenges, complexities and barriers influencing and affecting the sport's diverse stakeholders. Data collection included in-depth phenomenological interviews with Taekwondo international referees and coaches, and the researcher's observations during educational seminars and pre-

competition referee and coach instructional briefings. Qualitative data analysis used employing a phenomenological approach. This enabled a deep exploration of the lived experiences and perspectives of the participants, which was paramount to this project.

The findings highlight the challenges and educational needs of referees and coaches in the Oceania region. An innovative, technology-enabled solution is proposed to ensure the widespread accessibility and delivery of Taekwondo education across the Oceania region. The proposed educational model integrates online (interactive learning modules, instructional videos and assessment tools) and offline educational components (in-person workshops and seminars for practical training), providing accessible and flexible learning opportunities for referees and coaches. The model is tailored to meet the educational needs of the region's referees and coaches, addresses coach and referee accreditation, and provides potential avenues for improved revenue streams. The model can be adapted by the Oceania Taekwondo Union and will enhance the knowledge and skills of Taekwondo officials, leading to more consistent and effective officiating practices in the Oceania region.

Keywords: Taekwondo, officials, education, Oceania

Chapter 1: Introduction

1.1 Background

This thesis is the conclusion of an industry-based research project conducted under the University of Technology Sydney's (UTS) Industry Doctorate Program (IDP) with the industry partner the Oceania Taekwondo Union (OTU).

This project evolved out of the OTU's need to address the problem of providing an educational program to its members across the Oceania region. The OTU comprises 19 member countries (see Appendix A) with a broad range of educational levels, social standards, cultures and socio-economic environments.

1.2 Industry Doctorate and the IDP Program

The traditional Doctor of Philosophy (PhD) is an academic degree awarded for original research and contribution to the academic community. It is typically a research project conducted over a three- to five-year period, culminating in a thesis or dissertation.

An industry doctorate is a doctoral program that combines academic research with practical, real-world experiences in an industry or business environment. It emphasises the *practical application of knowledge and skills to a real-world problem in collaboration with an industry partner* (UTS, 2023).

Overall, the main difference between a traditional doctorate and an industry doctorate is the focus and purpose of the degree; the traditional PhD is more focused on academic research and the industry doctorate is more focused on applied research in a business or industry environment.

The IDP is a joint program between UTS and an industry-based sponsor to address a specific problem in the sponsor's organisation, with a goal of furthering the

interaction of UTS and the industry partner to mutual advantage. The IDP places a strong emphasis on the participating candidate's professional experience to achieve this goal. The IDP requires the researcher to be immersed in the sponsor's environment and/or organisation to be able to gain a deep insight into the organisation's problem and fully address the issues at the organisational level.

1.3 Education Context and Accomplishments

The researcher has an extensive background in both the sport of Taekwondo and in education, with over 40 years of involvement in the sport, including 25 years as an international referee. The researcher has held senior positions within the sport, both on national and international bodies, and has been in the tertiary education sector for more than 35 years, with roles including the development and delivery of undergraduate and postgraduate educational programs.

1.4 Justification for the Project

The need for accurate and speedy delivery of education in the sport of Taekwondo is a complex problem due to the frequent changes of rule interpretations and application. As with any organisation, the introduction of a change needs to be effectively managed from the organisational, technical and people (participants) perspectives. In regard to change management, the relevant sporting organisations do not differ from business organisations.

The organisational perspective is on ensuring (1) the change is developed, delivered and implemented effectively and in a suitably timely manner, and (2) the necessary tools—in the case of this project, the educational programs, structures and processes—are in place to allow this.

The technical perspective is on the change being successfully implemented with respect to the technologies within the sport being used by the sport's officiating bodies, and the technical components being used by the sport's participants in competition.

The people perspective is on ensuring that the change is embraced, adopted and used by the sport's participants, who, as a result of the change, may need to readjust the way they participate. As such, the educational model needs to provide the mechanisms and tools to ensure that the change occurs in a timely and suitable way.

The current educational environment in the Oceania region provides an educational model that is, in essence, a stand-and-deliver model using PowerPoint, delivered in a face-to-face mode. This inhibits the educational opportunities for stakeholders in the region and is dependent on the availability of a limited number of presenters to travel to member countries, done at considerable cost to the OTU. In addition, course content is only updated as the region's educational body is informed of rule changes via its educators attending international seminars conducted by the world body, World Taekwondo (WT).

A phenomenological approach was taken as it was imperative for this project to be able to explore and gain insights into the lived experiences (Goulding, 2005; Houston, 2022) of elite-level referees and coaches. Yin (2015, p. 14) notes that 'phenomenological studies attend not only to the events being studied but also to their political, historical, and sociocultural contexts'. By using a phenomenological approach, the research was able to collect participants' lived experiences as described in their own words. This was supported by the researcher's observations at pre-event referee and coach meetings/instructional briefings and educational offerings by the world and regional bodies.

1.5 Project/Research Objective and Project/Research Question

This research was part of an industry-based project with the OTU to address problems with the provision of coach and referee education in the Oceania region. The issues can be summarised as a lack of:

- a sufficient number of available, skilled educators across the OTU's member countries

- access to suitable educational programs across the region

- a standard educational program across all OTU member countries

- an accepted and recognised accreditation program across the region

- access to up-to-date interpretations and application of rules and regulations

- clear and transparent pathways for coaches and referees to progress to international accreditation.

The regional environment also presents three factors that make delivery of education in the Oceania region challenging:

- considerable cultural differences

- considerable differences in available financial resources within and between the member countries and the member countries' federations

- differing organisational structures and policies between the member countries and organisational issues related to the regional governing body.

Therefore, this research project addressed the question:

What is the optimal educational offering and platform to provide the best possible coach and referee educational opportunities for the sport of Taekwondo in the Oceania region?

The research areas of interest are shown in Figure 1.1.

Figure 1.1

Research Areas of Interest
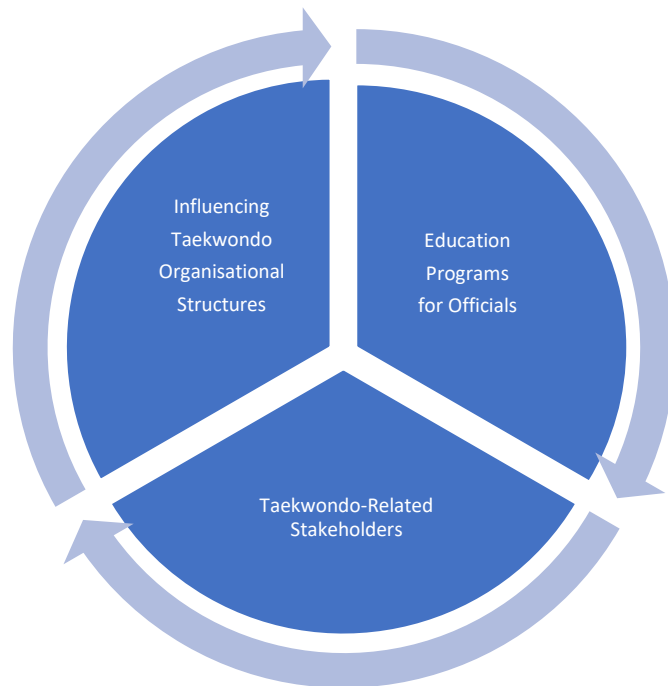
1.6 Research Method Outline

This project used a qualitative research method for data collection—a phenomenological approach supported by direct observations. Using a phenomenological approach means the collected data are drawn from participants' own 'world' experiences (Houston, 2022), and observative data provide a greater insight (Klinke & Fernandez, 2023) into participants' experiences.

Figure 1.2 shows the activities carried out in this project. The first steps were to examine the structure of the educational programs offered by the OTU, then those offered by other regional bodies and WT. The literature was examined throughout the research to identify current practices in e-learning and blended learning and to clarify knowledge in areas related to the sport of Taekwondo.

Figure 1.2

Project Activities
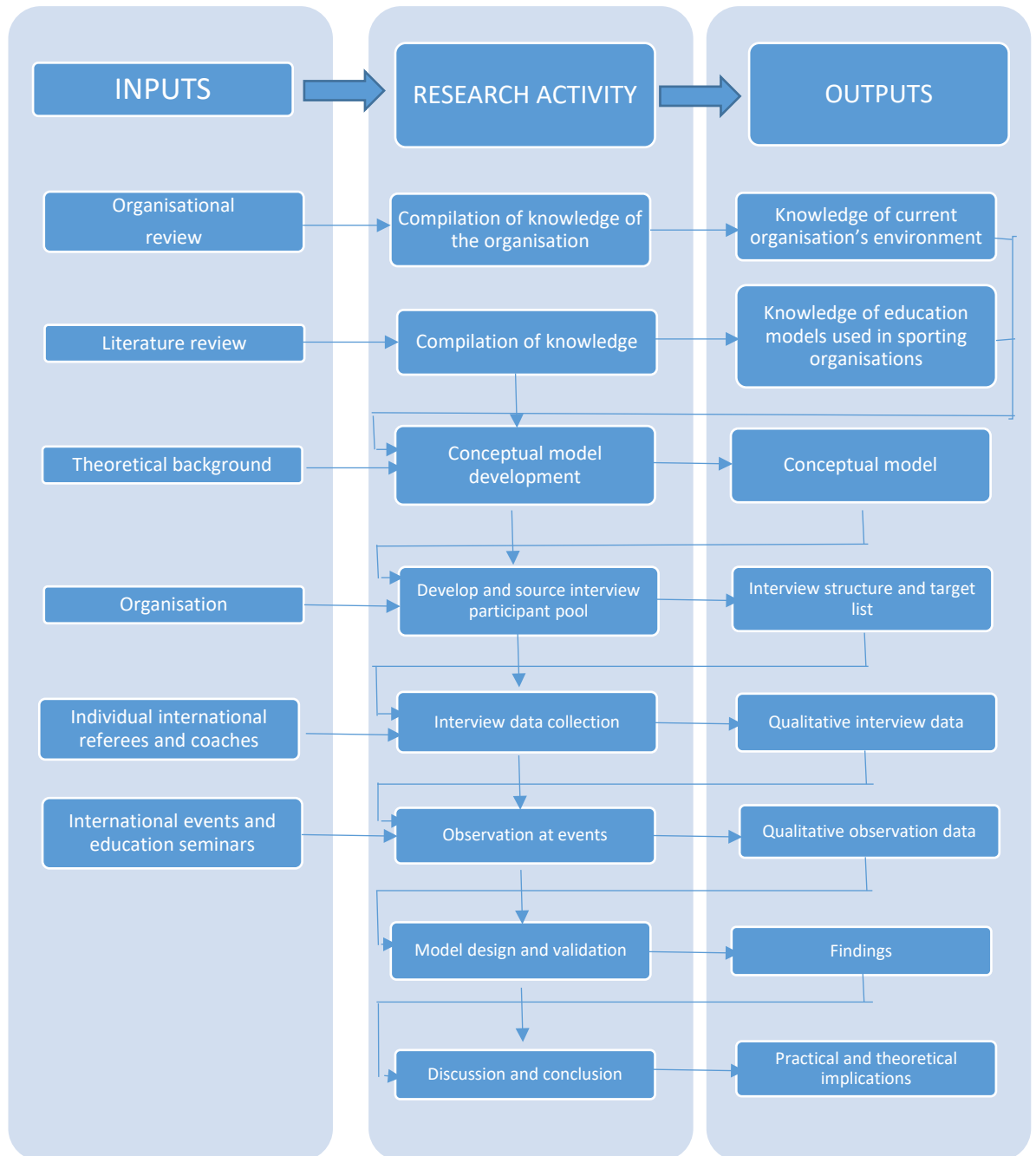
1.7 Limitations and Delimitations

This project used a phenomenological approach supported by the researcher's extensive observations. The project aimed to address problems in coach and referee education in the Oceania region; in this, it endeavoured to develop an education model

for referee and coach education for the OTU. While the scope of the project was the member countries of the OTU, the lack of experienced international referees and coaches in this region necessitated supplementing the participant pool to include international referees and coaches from other regions to gain accurate and deep understandings of the relevant issues. Issues and problems raised by participants that were specific to another region or not applicable to Oceania officials were not considered in this research.

1.8 Structure of the Thesis

This thesis comprises seven chapters, with each chapter focusing on different stages of the examination of Taekwondo sports education for referees and coaches. The thesis's structure is summarised in Figure 1.3 and outlined below.

Figure 1.3

Thesis Chapters

Chapter 1
- Thesis Introduction

Chapter 2
- Literature Review

Chapter 3
- Taekwondo and the Problem

Chapter 4
- Research Methodology, Paradigm and Design

Chapter 5
- Selection of Research Subjects and Research Method

Chapter 6
- Research Results

Chapter 7
- Findings, Conclusions, Implications and Future Work
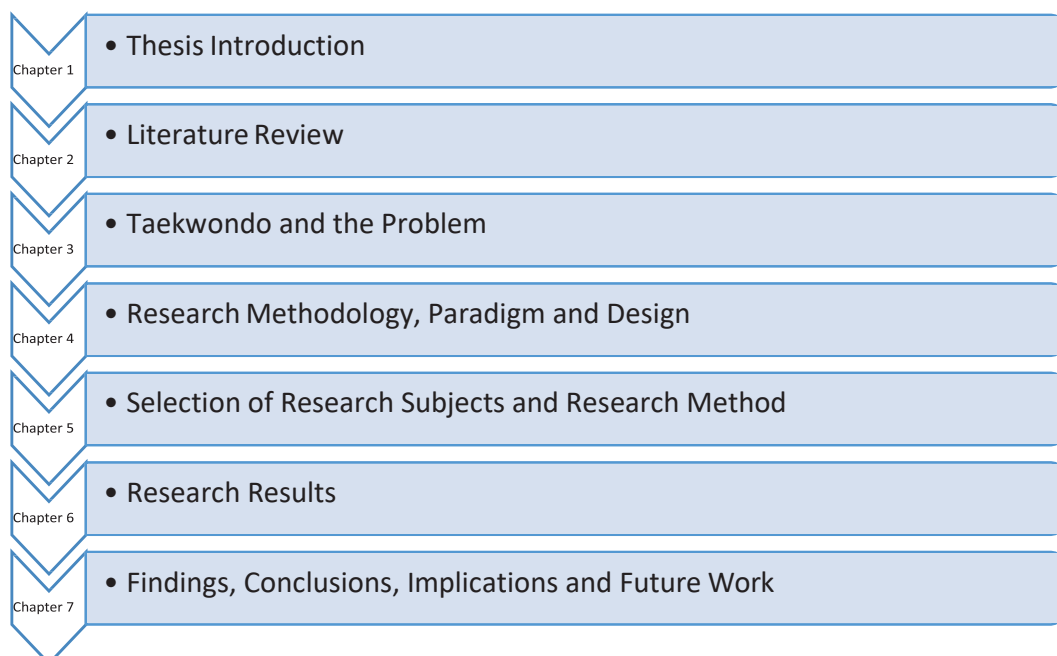
Chapter 1 provides a brief overview of the project, its background, purpose, objectives, research question and methodology.

Chapter 2 undertakes a detailed literature review on topics related to education and culture. This provides a detailed understanding of relevant subject areas and a deeper pool of knowledge for the researcher to draw from.

Chapter 3 explores the organisational structures in the martial art and sport and identifies the problems in the delivery of education for coaches and referees in the Oceania region.

Chapter 4 discusses the underlying epistemology of the qualitative approach used in this project and justifies the chosen phenomenology methodology. This chapter also discusses the units of analysis and selection of interviewees/participants.

Chapter 5 discusses the research method, including data collection, recording procedures, ethical considerations and data analysis.

Chapter 6 discusses and interprets the research findings. Data collected from the participant interviews and researcher's observations are analysed and reviewed.

Chapter 7 summaries the conclusions, discusses the implications of the research, and proposes future research directions.

Chapter 2: Literature Review

2.1 Introduction

This chapter reviews previous research in areas relevant to the project problem, including education delivery modes and culture. This review provides the knowledge foundation for the design of a suitable education model for delivering education to Taekwondo coaches and referees in the Oceania region. This model will address the region's potential obstacles and the educational requirements of sport officials.

Through the literature review, a comprehensive theoretical knowledge map was derived. This provided a structured framework with which to capture the key concepts and clarify relationships with respect to the aims of this project. Through the identification and the synthesizing of these key elements, the foundations have been laid to additionally guide future research. This mapping of theoretical knowledge not only provided clarity but also offers valuable insights for further explorations and advancement.

2.2 E-Learning

The concept of e-learning was first introduced in 1999 in a cognitive behavioural therapy seminar (Fox, 2022). It has since gained popularity, emerging as one of the fastest growing industries (Elearning, 2015; Mitra & Sharma, 2022; Thakur et al., 2022). In 2014, e-learning was reported to be a US$55.6 billion industry (Ferriman, 2014); in 2022, it was valued at over US$300 billion (GMI, 2023). There are many definitions of e-learning. Yusriadi et al. (2022) describe e-learning as a process to expand education on a global level using the latest technologies and innovative tools. Kok (2013, p. 20) defines e-learning as 'learning and teaching using electronic media and requir[ing] the use of information and communication technologies combined with

electronic media'. Initially, e-learning was known as 'internet-based training' or 'web-based training' (Beal, 2021), with the focus on how technology could facilitate and enhance teachers' and students' learning and teaching experiences (Lee & Hwang, 2022; Liu et al., 2010). Veerasamy (2010, p. 366) states that e-learning extends beyond 'online learning, virtual learning, distributed learning, networked learning or web-based learning' and considers e-learning to be an integration of educational activities, either individual or group, carried out via standalone or networked computers or other electronic devices either online or offline. This view is supported by others (Hurajova et al., 2022; Jacobs, 2019). Typical examples include Mass Open Online Courses (MOOCs), informative online educational videos such as Lynda.com, and digital collaboration platforms in the form of online discussion forums. In addition, classrooms designed with technology, such as eye sensors that can detect where students are focusing their attention (to better understand how the study environment affects learning engagement for further improvements), are also considered a form of e-learning.

E-learning opens many avenues for the delivery of education through the applications of technologies, providing opportunities to deliver education at any time and to any location (Purwanto & Atmaja, 2022; Tania et al., 2022; Tzankova et al., 2022; Versteijlen & Wals, 2023). E-learning can be in various forms (Chang et al., 2022; Dahan et al., 2022; He et al., 2023)—such as knowledge databases where step-by-step guidance is provided to execute specific tasks, online with support provided through forums, emails, chat rooms and bulletin boards (Obringer, n.d.)—and delivered synchronously or asynchronously to allow students to learn at their own pace (Greenagel, 2002; Katai & Iclanzan, 2023; Korres, 2023; Nugroho et al., 2023; Rautiainen, 2023; Romiszowski, 2004; Suleiman Khreisat, 2023). E-learning allows for either independent study, where students complete their modules independently, or

collaborative study, where students engage in discussions (Li et al., 2023; Wen et al., 2023). Education is now being delivered via mobile phones, tablets and other devices globally (eCreators, 2016; Eom, 2023; Moustakas & Robrade, 2022; Zhang et al., 2023b).

Rapid advancements in technology have increased the provision and uptake of e-learning (Akselrod et al., 2023; Rao, 2011; Stecuła & Wolniak, 2022a), with a multitude of benefits. However, e-learning needs to fulfil the needs of its stakeholders to be successful (Kabare et al., 2022; Wagner et al., 2008).

2.3 Benefits of E-Learning

E-learning provides mobile and flexible learning and has been noted by Patra et al. (2022, p. 1) as 'an excellent alternative to traditional teaching'. E-learning also provides for learning at one's own convenience and pace (Korres, 2023; Okoro, 2022; Rao, 2011; Sobaih et al., 2022) while providing greater options in modules and subject matter for individual learning objectives (Elmaadaway & Abouelenein, 2022; Hošková-Mayerová & Rosická, 2015; Kingsdorf et al., 2022; Optimus Learning, 2013). Learning can occur in the comfort and convenience of one's home; in certain countries, this is a strong preference where traditional classroom settings may have low standards or be difficult to reach. E-learning also potentially reduces travelling and attendance costs (for students and providers) and reduces providers' overheads (rent, administration, instructor costs, etc.). The result is more accessible learning at lower cost (Hošková-Mayerová & Rosická, 2015; Isroani et al., 2022; Lee et al, 2009; Noh et al., 2012; Optimus Learning, 2013; Pallavi et al., 2022). This applies across multiple contexts, including university or education environments and employee training.

From the perspective of the education provider, education can more easily be delivered on a global scale in a cost-effective manner. Online courses are scalable, able

to accommodate larger class sizes than face-to-face instruction and have a readily variable pace. This eliminates several constraints of conventional education delivery and makes education more accessible to wider audiences.

2.4 Challenges in E-Learning

There are disadvantages to e-learning. Learners require discipline, self-direction and time management (Al Shlowiy, 2023; Li, 2022; Murray, 2023; Pucillo et al., 2023). Depending on timing and how the educational program is structured, learners may not have access to the necessary support to resolve issues immediately and directly with the educator (Odeh & Keshta, 2022; Patra et al., 2022). A benefit of in-person teaching environments is the collaborative and interactive learning achieved through face-to-face interactions. This cannot be fully replicated with e-learning, which may lead to feelings of isolation by the learner (Li, 2022; Rao, 2011; Salahshouri et al., 2022). Additional issues are information overload and technical difficulties. Learners with lower computer skills are disadvantaged (Maatuk et al., 2022; Optimus Learning, 2013; Stecuła & Wolniak, 2022b) and may feel e-learning to be a daunting experience, thus hampering uptake of e-learning (Garbarova & Vartiak, 2022; Kaniadakis & Padumadasa, 2022; Nouraey et al., 2023).

The increasing complexity, functionalities and service offerings of technologies allow for educational programs to be more connected and integrated but require end users to have greater skill sets. Globalisation and increased dependence on technology have seen education institutions and multinational companies focus on online activities (Abd Algabar et al., 2023; Osei et al., 2022; Spencer-Oatey & Franklin, 2012), sometimes to the detriment of other entities within the organisations.

2.5 Success and Stakeholders in E-Learning

Successful application of e-learning in the development of educational programs is largely reliant on meeting the needs and requirements of the stakeholders. Stakeholders likely come from diverse backgrounds and cultures; thus, the first step in designing an e-learning solution is identifying stakeholders and their roles within the proposed e-learning environment (My et al., 2022; Romero et al., 2015). Stakeholders can be categorised as primary or secondary stakeholders.

2.5.1 Primary Stakeholders: Students

E-learning is used by students or course participants (Dash, 2022) to access courses—typically, courses they cannot access in person. Some use e-learning to improve or supplement their traditional learning experience, while others use it as their sole learning component (Sobaih et al., 2022; Teferi & Zerihun, 2022; Wagner et al., 2008). E-learning also provides access to learning for students facing social and/or cultural issues (Alyahya et al, 2022; Fung et al., 2022; Rich, 2016).

2.5.2 Primary Stakeholders: Instructors

Instructors in e-learning environments have similar roles to instructors in traditional learning environments; they guide participants in their learning by delivering lectures, providing course materials and interacting with participants (Khodabandelou et al., 2022; Wu et al., 2023). As with traditional (in-person) courses, the success of e-learning courses depends on enthusiastic, well-trained instructors and the provision of appropriate and relevant support (Dash, 2022; Jeyabalan & Cynthia, 2022; Tian et al., 2022).

2.5.3 Primary Stakeholders: Educational Institutions/Bodies

The widespread popularity of e-learning has seen many traditional educational institutions introduce online courses to deliver services to a broader range of students.

The high demand for online courses—further increased by the COVID-19 pandemic—has driven the emergence of online-only institutions. Certain online institutions have been identified as leaders in e-learning due to their high-quality courses (Alam, 2022; Jameel et al., 2022; Nkulu-Ily, 2023).

2.5.4 Secondary Stakeholders

Prior literature (Almala, 2006; Pappas, 2014; Wagner et al., 2008) identifies the following secondary stakeholders in e-learning:

- Employers—use e-learning for staff training, especially in organisations with a diverse workforce distributed across various regions.

- Content providers and designers—due to the need for rapid delivery of educational programs, some institutions are reliant on external bodies to create engaging e-learning materials and content.

- Technology providers—the providers of the Learning Management System (LMS), for example, Blackboard Learn and Canvas.

- Technical support staff—typically support the information technology technical infrastructure, but may also provide support for student registrations and other administrative matters.

- Accreditation bodies—evaluate the quality of education offerings and provide relevant accreditation of courses.

2.5.5 The Negative Side of E-Learning for Stakeholders

E-learning has benefits and disadvantages for various stakeholders. E-learning offers a whole new learning environment, but this necessitates acquisition of new or additional skills (Abdunabiyevna & Mansur, 2022; Mikić et al., 2022; Veeramanickam & Ramesh, 2022). Students and instructors need to learn technical skills to operate in the e-learning educational environment (Retscher et al., 2022; Romiszowski, 2004;

Veeramanickam & Ramesh, 2022). In addition, e-learning does not provide the same avenues for students to interact with their colleagues (Ali & Smith, 2015) or receive personalised support from instructors (Nehme, 2010); however, this is being lessened with advances in technologies such as Zoom (Wu et al., 2023; Zhang et al., 2023b). E-learning increases instructors' workload by the additionally required interaction via email, discussion boards and forums. Extra preparation time is also required to determine the methods of delivering learning materials and in the preparation of materials (Nicklin et al., 2022; Salas-Pilco et al., 2022).

Although e-learning eliminates the need for educational institutions to have physical campuses, creating and maintaining effective e-learning programs can be expensive. The most commonly cited reason for educational institutions being limited in e-learning adoption and development is projected costs, followed by resistance from faculties and academics who do not see e-learning as equivalent to face-to-face learning (Eton & Chance, 2022; Salahshouri et al., 2022).

Content providers and technology providers must ensure their content or technology does not violate copyright, is current and does not encroach upon privacy, while the format of their designed programs must be customisable and accessible for various institutions and users (Paris et al., 2022).

Accreditation bodies face new challenges with the growth of e-learning and accompanying pressure to accredit online courses (Amaral & Norcini, 2023). The difference in the nature of the online learning environment and questions of what standards to apply can make evaluation difficult.

As such, e-learning has created opportunities and challenges for various stakeholders. Table 2.1 summarises the stakeholders and their key benefits and concerns.

Table 2.1

Stakeholder Benefits and Concerns Resulting From E-Learning

Stakeholder	Benefits	Concerns
Students	• Access to diverse courses • Flexibility	• Lack of personal support • Lack of interaction • Necessity to learn new skills
Instructors	• Flexibility to reach broader audience	• Necessity to learn new skills • Increased workload
Educational institutions	• Access greater number of students	• Budget • Resistance from faculties
Employers	• Ability to train geographically dispersed and diverse workforce in less time and for less cost	• Lack of interpersonal skill growth among employees
Content providers	• Creation of business	• Ensure copyright clearance • Ensure flexibility of products
Technology providers	• Creation of business	• Ensure copyright clearance • Ensure flexibility of products
Technical support	• Creation of job opportunities	• Issues surrounding infrastructure
Accreditation bodies	• Extension/growth of courses to accredit	• Pressure to accredit growing number of courses • Difficulties accrediting courses across different environments

2.6 Cultural Issues and E-Learning

Cultural differences and similarities influence the success of information systems and e-learning (Nuryatin et al., 2022; Rokhman et al., 2022). Pappas and McKelvie (2022, n.p.) define culture as the 'characteristics and knowledge of a particular group of people, encompassing language, religion, cuisine, social habits, music and arts', and they further note Cristina De Rossi, an anthropologist at Barnet and Southgate College in London stating that 'culture encompasses religion, food, what we wear, how we wear it, our language, marriage, music, what we believe is right or wrong, how we sit at the table, how we greet visitors, how we behave with loved ones and a million other things'. Culture is dynamic, complex, learned through socialisation, and based on shared and negotiated values and norms; therefore, it is always changing (Gsir & Mescoli, 2015; Schuelka & Engsig, 2022; Spencer-Oatey & Franklin, 2012). Geert Hofstede's cultural dimensions (Hofstede, 2011) provide a useful basis for better understanding the culture of e-learning. Hofstede identified five, later six, main dimensions of national culture with which to understand and compare the similarities and differences of cultures. These dimensions are summarised in Table 2.2. While Hofstede focused on national culture, these cultural dimensions are also useful for understanding culture in other contexts, such as organisational or industry culture, cultures associated with various societal groups and subcultures.

Table 2.2

Hofstede's Cultural Dimension (Adapted From Hofstede, 2011)

Cultural dimension	Definition
Power distance	Degree to which less powerful members of the society accept power is distributed unequally and how inequality is managed. In a high power distance culture, hierarchical order is more easily accepted, whereas in low power distance cultures, there is a tendency for the equalisation of power distribution.
Individualism vs Collectivism	How loosely or tightly knit the social framework is within the community. In an individualistic society, the emphasis is on 'I', while the focus in a collectivist culture is on 'we'.
Masculinity vs Femininity	Preference for achievement and success or cooperation and caring for the weak and quality of life. A masculine culture emphasises achievement, whereas feminine cultures are more consensus-oriented and caring.
Uncertainty avoidance	Degree to which members feel comfortable with uncertainty and ambiguity and how uncertainty in the future is dealt with. High uncertainty avoidance cultures prefer certainty, whereas low uncertainty avoidance cultures have a more relaxed attitude and can better cope with uncertainty in the future.
Long-term (future) vs Short-term orientation	Degree of emphasis placed on the present or past versus the future. In long-term orientation, there is a stronger emphasis on future goals and achievements, whereas in short-term orientation, immediate gratification is more important.
Indulgence vs Restraint	Degree to which members either freely satisfy their basic needs and desires or follow strict social norms. In an indulgent society, relatively free gratification of basic and natural human desires related to enjoying life and having fun are allowed. Restrained societies regulate the gratification of needs via strict social norms.

Hofstede's cultural dimensions focuses the variations in cultures through these six specific dimensions which provide a framework to provide the understanding of how behaviour and societal structures are influenced by cultural values and norms. In contrast, Hall (1989) defines culture as the way of life of a group of people, encompassing their attitudes, learned behavioural patterns and material things. He considers that culture operates at a subconscious level shaping the thoughts and actions of individuals, and individuals become aware of their culture through exposure in that cultural context.

Context is in essence is the information surrounding and event or situation and interwoven with the significance and meaning of that event, and the 'cultures of the world can be compared on a scale from high to low context' (Hall & Hall, 1990, p. 6). People from different countries communicate in different ways, and having an awareness of these differences leading to better communication, comprehension and less misunderstandings.

According to Hall's influential concept of high-context and low-context theory (Hall & Hall, 1990, Kittler et al, 2011), an individual's cultural background has a significantly influential role in their ability to understand and appreciate complex messages. Hall categorizes cultures into high-context and low-context cultures based on communication styles and cultural factors like history, religion, and traditions.

Specifically, individuals from low-context cultures are anticipated to encounter greater challenges in comprehending complex messages and, consequently, to demonstrate less appreciation for such messages compared to individuals from high-context cultures.

High-context cultures are characterized by stability, cohesion, and unity. Those in a high-context culture tend to have a high reliance on history, their status, their

religion and other information to assign meaning to an event. Low context, however, typically value individualism compared to collectivism, and is characterised by prioritising individual needs and goals over the needs of the group (Triandis et al, 1988). In addition, Tella (2005) indicates there exists differences in politeness norms between high-context and low-context cultures. Where, in a low-context culture, the asking of questions may be considered polite and the asking of the same or similar questions might be considered impolite, intrusive and potentially offensive.

Communication for high-context cultures relies more on implicit meanings and non-verbal cues (Mogea, 2023). People in high-context cultures prefer symbolic and artful language, whereas low-context communication is more explicit and relies heavily on verbal messages and low-context people prefer task-related language, and would expect explanations when something remains unclear.

Context theory and Hofstede's dimensions provide insights into the influence of cultural backgrounds will have with respect to communication styles, preferences, and interpretations of complex messages across different cultural contexts.

Culture plays a vital role in facilitating the adoption of e-learning by learners, trainers and organisations. E-learning may be a cultural shift, thus requiring adjustment in attitude, knowledge base and understanding (Highley, 2013; Panackal et al., 2022). Accordingly, different cultures of learning within organisations need to be recognised and considered (Hyasat et al., 2022; Lea, 2003).

Several studies (Akhavan et al., 2023; Lea, 2003; Pitchford, 2022) have highlighted that maximising e-learning's potential requires an understanding of the cultural complexities within an organisation and developing an e-learning strategy that meets the organisation's needs. More mature organisations that already have a strong corporate identity tend to find e-learning platforms to be more conducive delivery

methods for their training and development. For example, the Volvo group was, via e-learning tools, able to deliver a standard induction training program across its culturally diverse workforce of over 50,000 employees to achieve a common culture (Lea, 2003). This increases organisational capabilities through knowledge management processes and better decision-making (Aparicio et al., 2016; Hannen & Aparricio, 2023).

In the LINE case study, culture was proven to be a vital consideration for businesses when considering e-learning adoption (Lea, 2003) and the most important factor for success. At the national level, the cultural considerations were customer traditions and codes; however, the business culture, which is unique to each organisation, also needs to be considered to ensure the effectiveness of training and professional development offered by e-learning.

2.6.1 Language Barrier

The magnitude of the cultural transition from classroom-based teaching to e-learning depends on an organisation's existing learning culture, teaching cultures, language and technology use. Despite the popularity of e-learning, uptake by education institutions to provide e-learning courses was slow prior to the COVID-19 pandemic. E-learning requires more than just the adoption of technology and highlights the importance of organisational change (Noh et al., 2012; Osei et al., 2022) and clear communication.

A main concern with e-learning uptake is language and communication barriers hindering its effectiveness. E-learning courses often implicitly have a particular style of language and expressions particular to certain cultures or contexts that are unfamiliar to learners from other cultures and countries. This ethnocentricity can be a barrier for learners outside of the originating culture and cause difficulties in understanding the

topic and subject matter in e-learning (Alanis et al., 2022; Mohammadi et al., 2011; Moustakas & Robrade, 2022; Spencer-Oatey & Franklin, 2012).

2.6.2 Power Distance

High power distance cultures (e.g., China and India) prefer experts to disseminate course content, as they are perceived as authoritative figures with status and power (Wang & Fränti, 2022). This may give students motivation and a sense of obligation to learn. In e-learning, however, the power distance is often narrowed; thus, e-learning is more conducive for lower power distance cultures (Khan, 2017; Nathan, 2008; Rao, 2011; Rodrigues, 2005; Yusriadi et al., 2022).

Adoption of e-learning is slow in organisations with high power distance cultures, where senior teaching staff and knowledge experts are respected, seen as authoritative figures and do not see the need to change (Dai et al., 2022; Noh et al., 2012; Zhang et al., 2023a). Conversely, e-learning uptake is high in low power distance cultures such as Australia, where academia and education providers are less threatened by changes in status thus more willing to adopt change. While the dropout rate with e-learning is higher than in traditional education, this rate can be controlled through the provision of a motivational learning environment (Chelawat & Sant, 2022; Kavulya & Misava, 2014; Lea, 2003).

2.6.3 Individualism, Long-Term Orientations and Collectivism

For students from an individualistic culture, individual satisfaction plays a key role in assessing the effectiveness of e-learning, with a stronger emphasis on the achievement of individual goals and individual contribution to an organisation (Aparicio et al., 2016; McCarthy et al., 2022; Singh et al., 2022; Zheng et al., 2022). However, it is important to leverage knowledge diffusion and acquisition through socialisation for sharing of knowledge.

E-learning requires discipline and self-direction; thus, it is more conducive for long-term or future-oriented and individualistic cultures, where individuals are more motivated for self-improvement and active learning (Hošková-Mayerová & Rosická, 2015; Ji & Xie, 2022) and, given the greater focus on future employability, more appreciative of development opportunities (Amsal & Susdiani, 2022).

For more collectivist cultures, e-learning platforms should promote information sharing and collaboration for effective learning outcomes, with greater emphasis on working together (e.g., group projects) to satisfy communal interests (Sewandono et al., 2022). For example, Japan has a highly collectivist culture that values congruence; therefore, e-learning styles that use team incentives are more likely to succeed (Mukherjee, 2006; Ramaswamy, 2002). However, Hofstede (2001) suggests a strong correlation of technology adoption with individualism (Castro-Lopez et al., 2022). This is supported by Liu et al. (2010), who highlighted the importance of students' individual learning behaviour as crucial to sustaining self-directed learning and technology management.

2.6.4 Uncertainty Avoidance

As e-learning courses often follow a standardised format, this helps to reduce the anxiety associated with an uncertain training process. Therefore, cultures with high uncertainty avoidance may prefer e-learning programs. Further, learners' country of origin and country of residence will influence the appropriateness of e-learning platforms. Developed countries typically have higher technology penetration and technology literacy rates than underdeveloped countries; therefore, learners from or residing in developed countries are more likely to be familiar with various types of programs. Conversely, learners from or residing in developing countries may face issues such as unfamiliarity with, or lack of access to, the technology and/or programs needed

for e-learning courses. Such issues increase uncertainty and hamper e-learning's effectiveness (Bühler et al., 2022; Gsir & Mescoli, 2015; Sayed et al., 2023).

2.6.5 Subject Matter

MOOCs typically do not have the benefit of being customisable for or targeted towards a specific audience or culture. MOOC attendees usually come from a range of countries and cultural backgrounds; this creates the challenge of delivering a course with the right cultural fit. However, e-learning programs or courses focused on further development or education on a particular subject matter or universal subject are generally more effective, given the likely more specific and educated audience. For example, learning in the science, mathematics and physics disciplines is less strongly influenced by culture due to the universal nature of these disciplines. Conversely, learning in disciplines such as industrial relations, politics and law is strongly influenced by culture.

2.7 Cultural Issues With E-Learning

E-learning does not deliver the same learning outcomes as traditional learning methods. Instead, e-learning should be used to supplement and enrich conventional education (Almulla & Al-Rahmi, 2023; Contini & Maturo, 2011; Subashini et al., 2022). This is achieved through promoting collaboration, reflection, and connecting and supporting learners working together. The success of learning solutions across e-learning and blended learning is influenced by both differences and similarities in culture (Rai et al, 2002).

2.7.1 Sensitivity to the Target Audience's Culture(s)

The target audience's cultures at all levels (national, organisational, middle management, etc.) must be considered in the design of e-learning courses and programs for these to be effective (Macpherson et al., 2005; Newton et al., 2002; Umar & Ko,

2022). An e-learning program must be able to sufficiently and suitably address participants' needs in a culturally appropriate manner (Liu et al., 2010; Maass et al., 2022; Maturo & Paone, 2012). Lea (2003) notes this is a fundamental aspect of delivering education. If this is not possible in the baseline e-learning program, additional support should be made available (e.g., via local teaching staff, or via online mediums such as chatrooms).

2.7.2 Technological Knowledge

Learners need a certain level of skill in information technology to access, fully experience and benefit from e-learning (Khan et al., 2022a; Khan et al., 2022b; Liu & Yu, 2022; Rao, 2011; Reynolds, 2008; Spencer-Oatey & Franklin, 2012). Therefore, consideration should be given to providing necessary additional support to enable learners to access, navigate and fully use an e-learning platform.

2.7.3 Fostering Cultural Identity

Participants learn and adapt to the culture of a learning environment (Spencer-Oatey & Franklin, 2012); therefore, in e-learning, the creation of a shared group identity through forming and fostering a community online helps learners converge and narrows cultural gaps (Hofstede, 2001). This, in turn, leads to communities of practice, which is an important aspect of the social learning system and e-learning (Aparicio et al., 2016; Wong et al., 2022). Over time, a unique culture for each group will be formed and the cultures within groups may converge and bring additional people in, increasing the effectiveness of e-learning. This process can be facilitated with appropriate tools and group size. Finally, while culture must be recognised as a crucial aspect of e-learning, e-learning can also drive cultural change; so culture and e-learning interact and influence one another.

2.8 Social Issues With E-Learning

People in a society share a common culture and most of their associations are within this group (Berry et al., 2022; Lansford, 2022; Norris, 2023). Society and culture are, therefore, counterparts to each other; society is composed of people and culture is the way they behave (Farooq, 2014). Society and culture can rapidly change with exposure to new technologies, which alters people's interactions, learning techniques, working methods, travelling patterns and business conduct (Almasri, 2022; Umar & Ko, 2022; Zhang et al., 2020). Technology—including that involved in e-learning—can influence people's thinking and their relationships with each other, and so it can influence the culture(s) within a society (Mutekwe, 2012).

Society consists of various interrelated parts that perform functions; various institutions—familial, religious, economic, political and educational—perform functions that assist the proliferation of society. An educational system is thus a part or sub-system within the larger system of society (Mondal, n.d.). Per Emile Durkheim (one of the first scholars to address education in society), the key function of education is to convey the norms and values of the dominant culture, which affects society (Chinwendu & Itoje-Akporiniovo, 2020; Sherzod, 2022; Tandi, 2019). Traditional classroom training consists of social interactions among students, colleagues and instructors who belong to a common society, facilitating transmission of societal norms and values. This is usually not available in e-learning environments, which gives rise to various questions regarding the effects of e-learning on society.

2.8.1 Social Isolation

E-learning allows learners to complete study without ever meeting their instructors and colleagues in person, which means less, if any, opportunity to physically meet and socialise compared to traditional, face-to-face learning. Ali and Smith's

(2015) case study at Eberly College of Business, Indiana University of Pennsylvania, concluded that feelings of social isolation led to high dropout rates in online courses. Conversely, regularly attending face-to-face classes reduced the sense of social isolation among students compared to those attending online-only courses (Ali & Smith, 2015; Hilton, 2022). Critics of online courses argue that online students do not get the chance to engage in an active community of learners and are deprived of the ability to engage in debates of ideas; however, this is being lessened via collaborative tools such as Zoom (Goode et al., 2022; Namboodiri, 2022).

2.8.2 Non-Volatile Conversation

Unlike in-person discussions, online conversations are recorded and retrievable, making a contributor directly accountable for what they say. This can inhibit some learners and thus decrease participation in any online discussion (Almendingen et al., 2023; Jia et al., 2023). Some users may just read the discussion comments and never contribute, while others may follow the discussions for a few days and contribute after they have formulated an informed opinion (Lynch, 1999). E-learning/online conversations are thus stilted and non-volatile. Interestingly, some academics are reported as hesitant to put their lectures online for fear of being mocked by students on social media websites such as YouTube, Facebook and Twitter (Grubb, 2011; Ying et al., 2021).

2.8.3 Unequal Accessibility

E-learning is, by definition, technology dependent. As such, accessing e-learning platforms and courses requires users to have access to certain technology (LaMotte, n.d.; Putro et al., 2023; Moustakas & Robrade, 2022; Yusriadi et al., 2022). Compatibility issues are also common, where the technology used by a course participant is not supported by the e-learning platform or vice versa. For example,

Apple's iPad does not support Flash; therefore, an online course using Flash would require a participant using an iPad to download an app allowing Flash websites to be loaded, or to download and convert Flash files on a computer and sync them to the iPad. Other issues include the availability of reliable internet and power supply (Optimus Learning, 2013). The technology dependency of e-learning means a potentially unfair advantage for those with sufficient resources to access the necessary technology, while those with less income or living in less technically and/or financially developed areas can be disadvantaged. In addition, people with certain disabilities (e.g., learning disability, low vision, hearing impairment) cannot access e-learning if the programs, courses and materials are not designed with consideration for these disabilities (e.g., simple text explanation, text-to-voice features, adjustable font size; Retová & Pólya, 2012).

2.8.4 Exacerbating Social Gaps

As discussed in Section 2.7.2, e-learning requires a certain level of technology literacy (Eli-Chukwu et al., 2023; Elneel et al., 2023; Govindasamy, 2001). Older learners can find e-learning difficult compared to younger learners due to less familiarity with technology and software (Maurer, 2001) and technology anxiety (Charness & Boot, 2009). This may result in greater social gaps between older and younger generations (Sen et al., 2022).

Research has indicated that e-learning requires learners to be multi-literate (i.e., able to understand various means of communication [written, verbal/audio, visual elements, etc.]), thus reinforcing the status of vulnerable student groups (Shahzadi, 2022). E-learning may require students to learn new technical skills to effectively participate, in addition to learning course material, thus creating additional burden (Alkabaa, 2022; Mirķe et al., 2019; Moustakas & Robrade, 2022). Digital literacy (the

ability to access, manage, integrate, evaluate and create information through technology) varies among individuals; e-learning may reinforce and widen the gap between those with and without digital literacy and provide an advantage to the former.

2.8.5 Lack of Accountability

The design of online courses tends to assume that the learners taking these courses are self-motivated and active (Liu et al., 2023; Nehme, 2010). This assumption has been questioned by Martens et al. (2007), who stated that the online student experience was less authentic than developers assumed and e-learning platforms should be adaptable to individuals' learning styles (Alvi, 2023; Zhang et al., 2020).

Research indicates that hierarchical societies are less successful in the online environment (see Section 2.6.2). These societies position trainers and instructors as subject matter experts, with accompanying respect and status, and students as accountable to them, creating an obligation to learn. Learners do not feel the same sense of accountability in the online teaching environment (Rao, 2011). Some educators and instructors have reported a preference for delivering lectures face to face over online modules as the learners' requirement/accountability to attend can increase their engagement and participation (see, e.g., Chigeza & Halbert, 2014; Joji et al., 2022).

2.8.6 Lack of In-Person Support

As opposed to face-to-face sessions, online environments may not provide an avenue for instructors to identify if a student is actively participating in the class/session or requires additional attention or support with their learning (Ahmad et al, 2023; DeCoito & Estaiteyeh, 2022; Nehme, 2010; Rich, 2016).

Lack of personal support is reported as one of the main reasons for high dropout rates in online education. For example, Rich (2016) reported that one online charter school had 80 students drop out for every 100 graduates due to lack of support.

Teachers and students in the online learning environment tend to communicate through emails and other web platforms. This hampers the development of professional personal relationships. Lack of physical proximity and high teacher-to-student ratios greatly inhibit teachers' ability to provide personal support in e-learning (Rich, 2016).

2.9 Blended Learning

Blended learning is an approach that combines online and face-to-face modes of delivery to reap the benefits of both (Abdellatief et al., 2011; Atwa et al., 2022; Ayob et al., 2023; Dakhi et al., 2020; Girme, 2022; Imran et al., 2023; Leveaux et al., 2016; Leveaux et al., 2019; Rausch & Crawford, 2012). Several positive outcomes are associated with blended learning (Lim et al, 2007), including increased student self-value (Zheng et al., 2022), decreased dropout rates, increased student satisfaction and improved learning (Castro-Lopez et al., 2022; Chau, 2022; Tinto, 2012).

Blended learning has developed over a series of educational trends, largely due to advancements in technology and innovation (Bizami et al., 2023; Sharma et al., 2022). According to Clark (2003), blended learning has evolved over six significant waves of technological innovation in education:

- writing, considered the initial technological advancement with phonetics and paper
- printing, which involved writing with movable type
- broadcast media, including film, radio and television
- mass media, such as audio-cassettes, videotapes CDs, USB flash drives, etc
- mass-produced computers with CD-ROMs
- internet technology, which enabled networked, web-based e-learning.

The evolution of blended learning through these six waves highlights technology's impact on the learning experience and how education adapts to technological advances.

Presently, following the aforementioned sixth wave, blended learning is 'a hybrid form of the online and traditional learning style' where face-to-face teaching and online delivery are used to complement one another (Ghimire, 2022, p. 93). The principles underlying blended learning are:

- emphasising achievement of learning objectives over the delivery method

- incorporating different learning styles to cater to a diverse audience

- integrating various types of knowledge into the learning experience

- tailoring the learning approach to meet specific requirements and providing additional relevant information when it is needed.

These principles reflect a focus on the learner and their individual needs and the recognition of various learning approaches. There are four levels or categories of blended learning:

1. Component—involves combining different channels to create a basic blend. Each component can function independently, and the number of components used depends on the criteria for blended learning. Components can be combined in series, parallel, or a combination of both.

2. Integrated—a blend designed to create a single, mutually supportive structure. Each component is developed with consideration for how it will fit into the overall learning experience.

3. Collaborative—provides learners with face-to-face or online tutoring and collaborative facilities. Collaborative relationships are formed between learners and tutors and between learners.

4. Expansive—extends beyond the expected components of formal learning and into the real world.

Blended learning has become an increasingly popular approach as it offers numerous advantages over traditional learning methods. Blended learning can enhance the learning experience through innovative use of technology while making delivery more time- and cost-effective (Anthony, 2022; Attard & Holmes, 2022; Islam et al., 2022; Padilla-Meléndez et al, 2013). Blended learning represents a fundamental shift in the way we think about teaching and learning, as it involves a reconceptualisation and reorganisation of the traditional educational dynamic (Garrison & Kanuka, 2004; Islam et al., 2022). Blended learning models are becoming more popular among organisations due to a range of advantages over using a single learning delivery medium (Eyal & Gil, 2022). Blended learning is a key strategy for achieving greater educational goals through a continuous learning process (Lock et al, 2021).

Comparative studies have supported blended learning in terms of the value it provides to students' learning experiences compared to online and face-to-face learning activities (Bashir et al., 2022; Bliuc et al, 2011; Ginns & Ellis, 2007). While face-to-face activities are preferred by students, blended learning is favoured over online-only approaches (Ng, 2011; Mohammed & Malo, 2022). Students consider blended learning a useful experience that motivates them in the learning process and enhances individuals' understanding of the subject matter (Divjak et al., 2022; Fehl et al., 2022; López-Pérez et al., 2011). Blended learning leads to a high pass rate on final exams and skill development in the delivered subject matter (López-Pérez et al., 2011). Thus, blended learning complements traditional learning and provides a platform for better results and skill development.

Per Carman (2002), blended learning has the following key components:

1. Live learning experiences or events: These are led by the instructor, with all learners participating synchronously. These events can take place face to

face or virtually and must contain the appropriate content to produce the desired learning outcomes. The optimal blend of face-to-face sessions and e-learning is necessary to ensure individuals gain a well-structured learning experience.

2. Self-paced learning: This refers to learning experiences that learners complete individually, at their own pace and convenience. Examples include internet-based learning, which may include additional tools such as audio, videos, and questions to enhance learning outcomes.

3. Collaboration: This involves creating an environment in which learners communicate with each other via various mediums, including email, discussion forums, or online chats. The blended learning environment can be peer-to-peer or peer-to-mentor. The successful delivery of the blended learning experience depends on having the appropriate human resources, physical infrastructure, technical resources and budget.

4. Assessment to measure learners' knowledge: This is a vital component of blended learning. It provides learners with feedback and the opportunity to test their understanding of the subject matter.

5. Performance support materials: These are up-to-date reference materials that augment the retention of learning and transfer of knowledge. These materials, such as summaries and audio-visual aids, provide an avenue for immediate maintenance, refreshing, or updating of current knowledge with minimal expense, usually through the use of technology.

6. Sustainability: This involves dealing with culture issues, change management and supporting an ongoing learning culture to ensure the longevity of the blended learning approach.

Blended learning should incorporate four key elements to create effective live learning experiences (Ando et al., 2022; Carman, 2002; Mshayisa, 2022):

1. capturing the learners' *attention*

2. providing *relevant* examples or analogies that are familiar to the learners

3. ensuring that learners remain motivated by having *confidence* in their skills and abilities

4. ensuring that learning experiences leave learners *satisfied* with their results.

There are different models of blended learning, designed to suit differing learning environments. Valiathan (2002) identified three models:

1. The skill-driven model—combines learning in a self-paced mode with interactive sessions facilitated by a mentor via face-to-face meetings, email and discussion forums.

2. The behaviour-driven model—blends online collaborative activities with classroom-based learning, allowing learners to experiment with new behaviours in a safe environment.

3. The competency-driven model—focuses on the transfer of tacit knowledge by observing and interacting with experts, leading to the development of competencies.

Modern-day blended learning models' components can be categorised as:

- offline:
  - workplace learning—learning through projects, apprenticeships and mentors in a real-life setting
  - face-to-face tutoring, coaching, or mentoring—personalised support and guidance from a teacher or mentor

- classroom—conferences, presentations, workshops and other in-person training sessions

- distributable print media—books, journals, logs and other physical learning materials

- distributable electronic media—CDs, DVDs, and other electronic materials that can be distributed physically

- broadcast media—learning content transmitted through television, radio, or other similar means

- online:

  - online learning content—digitally created learning materials such as videos, interactive quizzes and simulations

  - e-tutoring, e-coaching, or e-mentoring—personalised support and guidance from a teacher or mentor delivered through online platforms

  - online collaborative learning—collaborating with other learners through online platforms such as discussion forums, group chats and social media

  - online knowledge management—online systems for managing and sharing knowledge such as wikis and knowledge bases

  - the web—using the internet to access online resources for learning

  - mobile learning—learning through mobile devices such as smartphones and tablets.

Identified benefits of blended learning include ease of scalability, enhanced teaching quality, improved student access and success rates, higher satisfaction levels and increased return on investment (Abuhassna et al., 2022; Bursa, 2023; Maulida et al., 2022). However, there are many challenges that must be taken into consideration when planning and designing a blended learning program.

In their study on student engagement with blended learning, Holley and Oliver (2010) identified that the blended learning environment is well suited for students who come to their studies with prior positive educational experiences and work experience, as they are able to readily adapt and take advantage of the opportunities presented. Conversely, students who are poorly equipped are likely to have trouble adapting to the blended learning environment. These findings have been supported by several other studies (see, e.g., Dart, 2022; Ketsman, 2022; McCullogh et al., 2022). Therefore, when designing an e-learning platform, the designers must examine and consider the environments in which the program will be delivered and individuals' experiences and cultures.

An educational program must deliver the expected level of student learning within the online environment—likely entailing delivery to participants with different genders, levels of access to technology, educational backgrounds, cultures and languages. A blended environment must explore the opportunity to use various media beyond just basic webpages to provide a learning environment that is rich, engaging and motivates students. The online environment must be reliable and secure, with a robust information technology infrastructure to at least ensure the online environment is available at times when access is required. Planning is essential to develop a sustainable blended learning environment; ensure the needs, goals and objectives are met (Bizami et al., 2023; Chen, 2022; Moskal et al., 2013; Yaniawati et al., 2022); and, ideally, create a common vocabulary, taxonomy and repository for improved communication and sharing (Derntl & Motschnig-Pitrik, 2005; Manciaracina, 2022).

Driscoll (2002) provides recommendations for encouraging acceptance of a blended program (drawn from the IBM Mindspan program). He suggests blended learning facilitate the transition of learners from traditional classroom-based learning to

e-learning in a gradual manner, making the change more acceptable and manageable for both organisations and the learners. This is achieved through the provision of a balanced mix of face-to-face and online learning experiences catering for different learning styles and preferences, including:

- online assessments

- a discussion forum(s) for learners to access after training

- reference material links for the learners to use after the training program, to allow the learners the opportunity to further explore topics in their own time

- available online pre-work materials, which reduce costs and allow learners to be prepared

- set time periods for online support, allowing learners to ask questions of the instructor, and a support platform.

2.10 Chapter Summary

E-learning is frequently welcomed as a solution to the drawbacks of traditional education, including limited accessibility and affordability. The literature shows that e-learning has enhanced the flexibility and accessibility of education, making it appealing to a diverse range of users. E-learning could be used to deliver education in coaching or refereeing skills and disseminate updates to competition rules, regulations, interpretations and applications.

From an organisational perspective, the providers of Taekwondo education for the Oceania region need to be aware of culturally sensitive issues in the region when designing the course materials. Educational programs must be tailored to better suit the region's diverse groups of stakeholders and sport participants, taking into account their cultural differences. To support course participants further, educational programs should offer additional resources such as access to senior, experienced officials (who can

provide real-world experiences) or detailed explanations and subtitles in various languages for demonstration videos. While this approach would enhance the learning experience, it would entail significant costs (production and design costs, time, staff, etc.). Nevertheless, such inclusions would be greatly beneficial, improve courses' inclusivity and cultural relevance, and likely to lead to a greater learning experience and improved skill acquisition.

To address the issue of isolation and potential lack of interaction in online environments, e-learning groups, possibly led by the OTU's educational instructors, should be promoted as part of the online course to encourage participation and accountability among participants. This can also promote the motivation and discipline of course participants. This strategy means participants can benefit from a supportive community and feel more connected to their peers. Additionally, the region would benefit by having more educated and qualified coaches and referees; this may also improve retention of coaches and referees. Blended learning and e-learning's promotion of self-paced learning may affect the traditional role of course instructors, necessitating them to adapt to changing technology and delivery mediums to remain relevant. Addressing the identified challenges would enable the growth of blended learning and e-learning for Taekwondo education in the Oceania region. This would increase the reach of education (and so increase the number of learners) and improve the standard of coaches and referees within the region.

Chapter 3: Taekwondo and the Problem

3.1 Introduction

Examining the organisational complexities of the sport of Taekwondo is necessary to gain an understanding of the research problem. This chapter summarises the origins and current organisational structures of Taekwondo (as a martial art and competitive sport), provides an overview of the competition types, notes this project's key stakeholders, and states the research problem addressed in this project.

The sport of Taekwondo has significantly impacted the Oceania Taekwondo Union by fostering and encouraging a culture of discipline, physical fitness, and international sportsmanship, which in turn contributes to the development and growth of the martial art across the Oceania region.

The introduction of educational technologies for coaches and referees in Taekwondo will further develop effective training opportunities by providing improved training facilities, easier access to up-to-date materials, better-quality communication facilities, ultimately optimizing the coaching process and fostering a more comprehensive approach to athlete development while providing enhanced learning experiences.

3.2 Overview of Taekwondo

3.2.1 The Origins of Taekwondo

Taekwondo is both a martial art and a sport. Taekwondo originates in Korea. There has been considerable discussion on the origins and roots of the martial art (Ahn et al., 2009; Park & Kim, 2016). Some maintain that Taekwondo's roots can be traced back over 2,000 years, based on murals from Koguryo, the early Korean kingdom. That theory is supported by WT (Moenig, 2014). Others assert that the modern-day martial

art of Taekwondo is relatively new, having evolved from Japanese karate into its current form over approximately 50 years (Capener, 2016; Madis, 2003; Moenig et al., 2012). The position taken by WT is considered authoritative (Moenig et al., 2014).

The sport of Taekwondo, as contested at the Olympic Games and various open events and championships (national, regional and world levels), is a modern sport created in the twentieth century. Taekwondo was introduced into Korea by Koreans returning from Japan after the Second World War. It was originally referred to as Tangsudo (meaning 'the way of the Chinese hand based on the Tang dynasty') or kongsudo (meaning 'the way of the empty hand'; Capener, 1995). By the early to mid-1950s, a name change was needed to reflect it as a Korean martial art, categorise the developing sets of techniques as different from Japanese forms, and develop a 'history' to legitimise the art as uniquely Korean (Capener, 1995). As such, in 1955, the martial art was named 'Taekwondo', reflecting the use of feet (*tae*) and hands (*kwon*) and a way of life (*do*).

Taekwondo differs from other martial arts in that it is principally built around dynamic kicking and striking techniques using the hands and feet but also includes an array of self-defence techniques (Bridge et al., 2013; Bridge et al., 2014; Fachrezzy et al., 2021; Pieter, 2009; Schlüter-Brust et al., 2011; Stepan, 2002). It is considered to be the most widely practised martial art in the world, being practised in over 212 countries (WT, 2022b). Taekwondo basically has four elements or components: Taekwondo forms, which are referred to by various names, including Poomsae, Hyung and Tul; Sparring or fighting, known as Kyorugi; breaking techniques using the hands and feet, known as Kyukpa; and Hoshinseul, referring to self-defence.

Taekwondo as a sport is contested in each of these four elements, and the governing bodies for competitions broadly fall under the controlling bodies of the

International Taekwondo Federation (ITF) and World Taekwondo (WT; originally called the World Taekwondo Federation [WTF]).

3.2.2 Taekwondo Competition

The ITF was founded in 1966. Sparring competitions under ITF rules stipulate no contact. Even so, athletes still wear protective equipment consisting of foam head gear and foam hand and foot protectors to minimise the chance of injury. Generally, sparring matches consist of (a) two rounds of two minutes with a one-minute break between rounds for elimination rounds and (b) three rounds of two minutes with a one-minute between rounds for final matches (Pieter, 2009).

WTF was founded in May 1973 and renamed WT in June 2017 (WT, 2022b). Sparring competition under WT rules is full contact. As such, athletes wear considerably more protective equipment, consisting of a foam helmet, forearm and shin pads, hand gloves and foot socks, a cup and a protective chest guard, often referred to as 'the PSS' (Protection Scoring System). Sparring competition rules permit kicking to valid parts of the body, including the head and face. However, the only hand technique permitted is a punch to the body, with any hand strike to the head or face being illegal (Pieter, 2009). Sparring matches are all normally three rounds of two minutes with a break of one minute between rounds. However, in WT sparring competition, round duration may be changed in certain circumstances—to one minute, 1.5 minutes, two rounds of two minutes, or one round of five minutes. If the match is drawn, an additional one-minute 'golden point' round is conducted. In addition to individual sparring, both ITF and WT have team competitions and competition in forms, breaking and self-defence.

Components of the martial art of Taekwondo have been developed into the current form of the sport Taekwondo, which is now contested globally and within five

regions. Both the ITF and WT conduct tournaments at all levels up to and including their respective world championships. The first Taekwondo world championships were conducted by the ITF in 1974 in Montreal, Canada. The first world championships conducted by WT (then the WTF) were held in Seoul, South Korea, in 1973. Immediately preceding this competition, the first set of competition rules was formally established.

Competitors in both ITF and WT Taekwondo competitions must hold black belt certification. For ITF competitions, black belt certification is issued by the ITF (ITF, 2022a), and for WT-sanctioned competitions, black belt certification is issued by the Kukkiwon (WT, 2022a).

The Taekwondo contested at the Olympic Games is under WT competition rules. Athletes competing in Taekwondo at the Olympics are still required to have a black belt issued by the Kukkiwon. However, following the signing of Protocol of Accord by the ITF and WT in August 2014 (see Appendix B), athletes with either an ITF- or Kukkiwon-issued black belt may compete in either / both WT and ITF competitions.

In addition to the various competitions conducted under the auspices of the ITF and WT, the Kukkiwon conducts a competition known as the hanmadang, which may be described as a competitive multievent Taekwondo festival.

The main forms of competition are discussed in the following sections.

3.2.2.1 Kyorugi (Sparring)

One of the disciplines in Taekwondo is sparring, known as kyorugi. There are, in essence, three forms of sparring: one-step sparring, three-step sparring and free sparring. One-step and two-step sparring are, in essence, set moves in attack and counterattack and mainly focused as a form of self-defence (hosinsul).

Free sparring is sparring against one or more opponents in which there is no set format. It is usually contested as part of a Taekwondo class and has minimal or no contact to minimise the likelihood of injury. It is from free sparring that competition sparring evolved, where the contestants spar under strict rules and with limited sets of Taekwondo techniques (to reduce the risk of injury and ensure fair competition).

3.2.2.2 Poomsae (Forms)

Taekwondo, as with other martial arts, has its own sets of forms. Officially, the Taekwondo forms were developed in the 1960s, after Taekwondo began distancing itself from the karate forms (Moenig & Kim, 2019). The Taekwondo forms were initially used for training and grading purposes, then later developed into a form of competition.

A Taekwondo form is a set of predefined, planned offensive and defensive movements using various Taekwondo techniques and teachings. It is self-practised against imaginary opponents (Dziwenka & Johnson, 2015; Kazemi et al., 2016; Kukkiwon, 2006). The Taekwondo poomsae enables practitioners to practise many of the Taekwondo movements, develop sparring techniques and 'improve flexibility movements, master body shifting, build muscles and breath control' (Choi, 1979, p. 360) in a non-contact environment. Fachrezzy et al. (2021) describe poomsae as a form of active martial arts–related meditation requiring both concentration and harmony with the practitioner's mind, body and spirit.

Under WT, there are two sets of forms—Palgwe and Taegeuk—generally referred to as poomsae. Early practitioners in Taekwondo learned the Palgwe forms until WT switched to the Taegeuk forms. Under both the Palgwe and Taegeuk systems, there are eight colour belt forms and nine black belt forms, which are the same for both systems (WTF, 2019). Under the ITF, the equivalents of poomsae are referred to as

'patterns', 'tul' or 'hyung'. The ITF has a suite of 24 patterns, representing each hour of the day (Choi, 1979).

WT accepted poomsae as a competitive sport in 2000 due to the skill, techniques and physical exertion required to correctly perform the movements (Koh, 2014). The first set of formal competition rules was enacted in 2003 (WTF, 2019) and the first WT World Poomsae Championships were held in 2006, with subsequent world championships being held every year (Kim et al., 2020). Poomsae competition is divided by gender and age and is contested in individual, pair and team competitions. Competitions are held for both the traditional poomsae and free-style poomsae (WTF, 2019).

3.2.2.3 Hanmadang (Multievent Festival)

The hanmadang is considered a type of competitive Taekwondo festival. The format of a hanmadang competition involves various components of Taekwondo, consisting mainly of various types of breaking (destruction) using various hand and foot breaking techniques, poomsae competitions, and team contests in both breaking and poomsae. There is no kyorugi competition in hanmadang. The hanmadang additionally has its own referees and referee qualifications (accredited by the Kukkiwon). Many hanmadang referees also hold international referee qualifications in kyorugi and/or poomsae issued by WT.

Unlike kyorugi and poomsae competitions, hanmadang is run under the auspices of the Kukkiwon and not WT. However, Taekwondo athletes may compete across any of the three forms of competition—kyorugi, poomsae and hanmadang—depending on eligibility requirements. Eligibility to compete in the hanmadang is based on (a) age in relation to the competition event and division being entered and (b) holding a dan or poom (junior) black belt issued by the Kukkiwon.

The first world hanmadang competition was held in 1992, with practitioners from across the world participating. Currently, the hanmadang is held annually and usually contested over a week, typically attracting over 5,000 participants from over 50 countries (Kukkiwon, 2022).

3.3 Organisational Structure of the International Governing Bodies of Taekwondo

In Taekwondo, unlike other sports, there are several organisations that claim to be the world body. The two most widely recognised are the ITF and WT (known up until June 2017 as the WTF).

Both the ITF and WT are styles of Taekwondo and have their origins in Korea, with the ITF from North Korea and WT from South Korea. The focus of the two world bodies differs. WT is more aligned towards competition or sports Taekwondo and is strongly associated with the Kukkiwon. The ITF is more aligned towards the traditional martial art and self-defence, though it still does have competition up to and including world championships. The respective Taekwondo contested under the two bodies are quite different in terms of rules and regulations.

3.3.1 The International Taekwondo Federation

Three organisations claim to be the world body for the ITF. As such, it is difficult to ascertain the precise number of countries in which ITF Taekwondo is active. The initial ITF organisation was established in 1966 in South Korea by General Hong Hi Choi. This body operated there until it moved, due to political conflict in South Korea, to Toronto, Canada. In 1985, this body relocated to Vienna, Austria. This body currently has 127 member countries (ITF, 2022c). At the time of founding the ITF, General Choi lived in South Korea. He later defected to North Korea, from where he continued to manage the ITF until his death in 2002.

Following General Choi's death, a dispute arose following an Extraordinary Congress of the ITF decision to pass the presidency to the North Korea International Olympic Committee member Dr Chang Ung. Some ITF members claimed this decision was illegal under the ITF's constitution; the dispute was not resolved, and these members subsequently formed a new federation, also known as the ITF. This ITF is located in Benidorm, Spain, and has 110 member countries (ITF, 2022b).

Dr Chang Ung, as president of the initial ITF body, signed a Protocol of Accord in 2014 with WT (see Appendix B), allowing this ITF's competitive members to participate in WT-sanctioned events and vice versa. This provided a pathway for ITF's members to participate and gain experience in competition under WT rules and, following the acquiring of Kukkiwon black belt certification, be eligible to participate in the Olympic Games.

In 2001, following a dispute between General Choi and his son, Jung Wha Choi, his son was expelled from the ITF and subsequently formed another international organisation, also called the ITF. Jung Wha Choi and his supporters considered this new organisation to be the valid ITF. This ITF is headquartered in Middlesex, United Kingdom, and, according to its website, has 169 organisational members (ITF, n.d.). This ITF additionally has an offshoot organisation in Seoul, South Korea, that refers to itself as the ITF Headquarters.

The three ITF organisations have different structures in relation to regional affiliations and organisational structures. Otherwise, the three ITF organisations are basically the same in so much as they have the same standards for teaching Taekwondo, including the same patterns, sparring rules and competition formats. In general, athletes from one ITF organisation can participate and compete in events sanctioned by either of the other two ITF organisations.

In addition to the three more recognised ITF world bodies, there are several additional bodies that claim themselves to be world bodies (e.g., the Unified International Taekwondo Federation, Global Taekwondo Federation, etc.), all of which practise and compete in the style and forms as ITF Taekwondo.

3.3.2 World Taekwondo

The WTF was established in May 1973 at the first world championships held by the Kukkiwon (see Section 3.3.3) in Seoul, Korea. The WTF was established following its separation from the ITF due to political reasons. Representatives from 35 countries attended its inaugural meeting. The WTF formally changed its name in June 2017 to simply WT. The organisation has had two presidents since its inception: Dr Un Yong Kim as the founding president (1973–2004) and Dr Chung Won Choue (2004–present).

WT is headquartered in Seoul, South Korea, and has offices in Lausanne, Switzerland. WT is a member of the Association of Summer Olympic International Federations and, in July 1980, was recognised by the International Olympic Committee. Taekwondo (under WT) debuted at the Olympic Games at the 1988 Seoul Summer Olympics and appeared again at the 1992 Barcelona Olympic Games. In both cases, the sport was contested as a demonstration sport. Taekwondo debuted as a full medal sport at the 2000 Sydney Olympic Games, and it has since continued as a full medal sport at each Olympic Games.

WT has 212 member countries as of April 2022. Each member country, known as Member National Associations (MNAs), falls into one of the five regions: Africa, Asia, Pan America, Europe and Oceania. Each MNA has representation and voting rights at certain levels in WT, for example, at the WT General Assembly.

WT is actively promoting the sport in numerous sectors. To this end, it oversees para-Taekwondo, which has competitions in both sparring and poomsae; deaf Taekwondo; and the promotion and development of the sport globally.

3.3.2.1 Asian Taekwondo Union

The Asian Taekwondo Union (ATU) was established in September 1978 (ATU, 2019) and governs all Taekwondo activities in the Asia region. It currently has 44 member countries. Being the region in which the sport and martial art of Taekwondo originated, it has strong participation and a large number of events. Within the region, there are numerous open and national championships and regional championships. The region hosted the first WT world championships and supported the Olympic debut of Taekwondo at the 1988 Seoul Olympic Games.

3.3.2.2 African Taekwondo Union

The African Taekwondo Union (AFTU) was established in 1978 and is headquartered in Cairo, Egypt. It has 52 member countries spread across five zones— North, South, East, West and Central (AFTU, n.d.). Each zone conducts its own competitions and Taekwondo-related activities, and participates in the activities and competitions conducted under the regional body (AFTU, 2023). The region has produced several world champions and Olympic medallists and hosted world championship events and international opens. International open competitions in this region regularly attract over 1,000 contestants (Mareg, n.d.).

3.3.2.3 European Taekwondo Union

The European Taekwondo Union (ETU) was founded on 2 May 1976 (ETU, 2023) and has 52 member countries. In the European region, international competitions are run almost weekly, attracting the top athletes from many regions. International opens in the European region commonly attract over 1,000 contestants (Mareg, n.d.).

The European Taekwondo Union attracts considerable sponsorship, in addition to event sanctioning fees and WT funding, making it one of the more financially sound regions.

3.3.2.4 Pan American Taekwondo Union

The Pan American Taekwondo Union (PATU) is the governing body of Taekwondo in the Americas and Pan-Pacific countries. It was founded in September 1977 by then President of the WTF Dr Un Yong Kim (PATU, 2021). It has 45 member countries and is the second-largest region. It runs a considerable number of major international opens and regional events that are contested over four or five days and attract a large number of contestants. For example, the 2019 US Open attracted over 2,400 contestants from over 80 countries (Simplycompete, 2019).

3.3.2.5 Oceania Taekwondo Union

The Oceania Taekwondo Union (OTU) was established in July 2005 in Sydney, Australia, during the staging of the first Oceania Taekwondo Championships. The OTU has 19 member countries and is the smallest of the five regions. The member countries vary vastly in culture, levels of disposable income, organisational structures, educational levels and so on. There are many issues surrounding attendance and participation in international events due to distance and costs. Competition is usually held biannually and, due to financial constraints, multiple regional competitions and championships are often merged together and held concurrently over two- or three-day periods. International open competitions and educational seminars and courses run by WT are rarely held in the region, mainly due to the costs involved and difficulties in attending, leading to very small cohorts.

3.3.3 Kukkiwon

Following the end of Japan's occupation of Korea in 1945, many martial arts schools began to spring up throughout Korea. These schools taught mixed variations of

martial arts, with some having roots linked to taekkyeon and subak, or possibly other variations of Korean martial arts with influences from other styles of martial arts. By the mid-1950s, nine schools, known as kwans, had emerged. Following a demonstration of the martial art during the Korean War, the South Korean President ordered the schools to unify into one form of martial art. In 1955, this new martial art was named Taekwondo, and in 1959, the Korea Taekwondo Association was created to enable and assist in the unification of the kwans.

In the early 1970s, the Korea Taekwondo Association lobbied the Korean Government for a national training facility to act as the centre for Taekwondo. Once established, the Kukkiwon took over the main responsibilities of curriculum, grading and other style-defining activities and functions. This is generally known as the headquarters of Taekwondo and hosts the WT Academy. The WT Academy is responsible for the management of the Kukkiwon-style Taekwondo curriculum, Taekwondo-related research, and Taekwondo instructor education and training.

The Kukkiwon is the official governing body of Taekwondo, as established by the South Korean Government, and falls under the International Sports Division of the Ministry of Culture, Sports and Tourism. Unlike other martial arts world bodies (including the ITF), which issue their own certifications, WT Taekwondo certifications/dan certificates (black belt certificates) are issued by the Kukkiwon. These are required to be eligible to compete at any WT-sanctioned event. WT itself does not issue any black belt certifications but does issue and manage the other certifications and education related to competition.

While WT and the Kukkiwon are very closely aligned and, to some degree, intertwined, they are technically two separate bodies. WT is the international body for the sport of Taekwondo, with that Taekwondo style being an offshoot of the style

developed through the Kukkiwon. The Kukkiwon is a government-supported academy for the management and development of the martial art of Taekwondo.

3.4 Evolution of Kyorugi Competition

Both the ITF and WT held their respective world championships in the early 1970—WT in 1973 in Seoul, Korea, with 19 countries participating, and the ITF in 1974 in Montreal, Canada, with 17 countries participating. WT holds its world championships biannually and runs many other world-level events, such as world junior championships, para-Taekwondo championships and Olympic selection events (see Appendix C). The ITF also holds its world championships biannually and runs other events, though less in number to WT. The ITF and WT kyorugi competitions vary greatly; the competitions are different in terms of permitted techniques, scoring and penalty situations, protective equipment worn by athletes, and referees' hand signals and commands. The primary focus of this project/research is the provision of education for kyorugi coaches and referees in the Oceania region under the OTU, the regional body under WT. As such, this thesis focuses specifically on problems within the Oceania region and OTU.

Compared to other sports and martial arts, Taekwondo kyorugi competition is relatively new and is continually evolving. As previously mentioned, the first set of WT kyorugi competition rules was enacted for the first WT (then WTF) world championships in 1973. Since then, there have been no less than 30 amendments (including substantial revisions) to the kyorugi competition rules, across all aspects of the sport.

Prior to 1973, Taekwondo had been contested on many different stages, in various forms and at a diverse set of levels. This included competition in dojangs (training gyms), dojangs competing against each other, state/province competitions and

national championships. When Taekwondo deputed at the 1988 Seoul Olympic Games as a demonstration sport, scoring was done manually by each of the corner judges using pen and paper. Match scoring has progressively incorporated more and more technology, and the sport has undergone a series of modifications to make it more attractive to spectators. WT has additionally expanded the sport into many different formats and arenas, including team competition and single elimination competition in differing formats. Para-Taekwondo has been accepted and introduced in the Paralympics Games, debuting at the 2020 Tokyo Paralympic Games.

The sport of Taekwondo uses a subset of techniques of the martial art. Sports Taekwondo consists primarily of kicking techniques, with the only valid attacking hand technique being a punch with a closed fist. Athletes score points using kicking techniques and the punching technique to make contact with a valid scoring area with sufficient impact. Scoring areas are the front of the chest and the head. Different techniques striking different parts of the body have different point values; for example, a spinning kick technique will have a higher score than a non-spinning kick technique or a punch. Punches may only be scored with contact to the chest area; punching the head incurs a penalty and, depending on the severity, can result in disqualification. There are several ways in which an athlete may win a match, including:

- an athlete scoring more points than their opponent after the three rounds or match time

- winning by a point gap of 20 points in the second or third round

- winning the majority of the three rounds

- winning through the opponent being disqualified by having been given 10 penalty points, known as Gam Jeoms

- the opponent being disqualified for misconduct.

3.4.1 The Olympic Impact

Taekwondo has undergone considerable changes since entering the Olympics. Many of these changes have been due to the increasing requirements on the sport to meet the expectations of the International Olympic Committee. In addition to changes for transparency in decision-making/scoring, weight categories have been amended. World championships have eight male and eight female categories. At its full medal sport debut at the 1992 Barcelona Olympic Games, Taekwondo had these 16 categories (Kim et al., 1999); however, in subsequent Olympic Games, it has been reduced to four male and four female categories.

Due to the limited number of spots for athletes to compete at the Olympic Games, WT developed selection criteria, quotas and Olympic selection events. This was accompanied by the extension of coach education specifically for the Olympics, extensive education and selection processes for international referees, and enforcing gender balances among officials.

3.5 Accreditation and Education for Taekwondo Competition

There is a considerable array of education forms and accreditation types in the sport. All the Taekwondo world bodies offer some form of accreditation for at least some component of the martial art and for the sport; in most cases, accreditations are only valid with the awarding world body. For example, an international referee accreditation issued by the ITF is not valid with WT, a black belt certification issued by the Kukkiwon is not valid with the ITF, and so forth. As this project focused on the OTU, the accreditation outlined below is specific to individuals who are members of an MNA within the OTU.

3.5.1 World Taekwondo Accreditation and Education

WT provides education programs for all levels of international accreditation for coaches, referees and technical delegates. While these accreditations are issued by WT, it is up to each individual country as to whether they recognise the accreditation or not. Some countries also require equivalent domestic accreditation.

3.5.2 Kukkiwon Accreditation and Education

The Kukkiwon provides educational programs specific to Taekwondo instructors and their certification in areas related to the martial art, not sports Taekwondo. This includes black belt certification. However, athletes are required to have Kukkiwon black belt certification to compete in WT-sanctioned events and coaches and referees are required to have certain black belt grades prior to being eligible to obtain WT certification. For example, males are required to have a Kukkiwon 4th Dan and females a Kukkiwon 1st Dan (or, if from developing countries, a 2nd or 3rd Dan) to attend an international referee seminar. However, a person can only be a 'P class' (provisional) until they have achieved their 4th Dan (WT, 2022c).

3.5.3 Regional Accreditation and Education

The five WT regions differ in their respective accreditations and educational programs. Prior to 2020, coaches were required to have an accreditation (or coach's licence) issued through the respective region. The programs for this accreditation were developed and delivered by individual regions but recognised by all regions. This process has been discontinued and the education for a coach's licence is currently provided online via WT. Regions offer varying levels of referee education; however, these programs are mainly aimed at senior referees within that region and are, directly or indirectly replications of the WT programs.

3.5.4 Oceania Taekwondo Union Accreditation and Education

The OTU introduced its regional accreditation and education programs to assist its member countries in providing education to individuals. Unlike other regions, the education provided by the OTU is not restricted and is open to all the sport's stakeholders at any level (for participation and accreditation). This is especially beneficial for the majority of its member countries, which have no education programs. It is up to individual member countries to adopt the OTU programs or have their own program.

3.5.5 National Bodies Accreditation and Education

In addition, individual national bodies offer their own accreditation and education programs. These programs are usually designed domestically and may even vary from one state or province to another. While the programs are usually developed based on WT competition rules and regulations, there are often variations to suit the domestic environment. Additionally, as these programs are independently developed, there are inconsistencies between their interpretations and applications of WT rules.

Some national bodies will only permit coaches and referees to officiate if they have a national accreditation, regardless of any other accreditations (including those from WT and/or their regional body). Not all national bodies have an accreditation and/or education program—this is not uncommon in the Oceania region—and instead rely on individuals who self-train or seek accreditation outside their country.

3.6 Drivers for Change in Kyorugi Competition

The sport of Taekwondo is continually evolving. For the sport to remain in the Olympic Games, it must meet the International Olympic Committee's many requirements. This has mainly related to transparency in scoring and match decision-making. Consequently, each Olympic Games has seen increasing use of technologies in

all aspects of the sport, including the continually evolving PSS and use of video review. With each update in technology, athletes vary techniques to be able to best score on the latest version of the technology. Subsequently, there are now legal techniques being used in the sport that are not Taekwondo techniques or variations of Taekwondo martial arts techniques.

Prior to being an Olympic sport, changes to the rules and the sport were minimal. Since becoming an Olympic sport, almost all aspects of the sport have changed, from the sizes and dimensions of the competition area, to the athletes' uniform (dobok) and protective equipment, to the structures of the sport, such as techniques, weight categories, point scoring values and penalty criteria. While all disciplines in Taekwondo are enjoying increasing popularity, participation and competition, kyorugi has experienced the greatest uptake and, consequently, seen the most dramatic changes.

The sport has also become more professional, to the extent that some countries have full-time coaches and athletes are changing nationalities in pursuit of financial rewards. Growing popularity, global marketing and major media coverage have attracted significant sponsorship funding for the sport. However, this success is creating a divide in the sport, as wealthier countries and regions have the capacity to keep up with changes while poorer countries and regions do not, to the detriment of their Taekwondo stakeholders.

3.7 The Project's Key Stakeholders

Taekwondo (as a sport) in the Oceania region has a number of key stakeholders (see Figure 3.1), including athletes, coaches, domestic and international referees, the sport's national-level administrators, regional Taekwondo bodies and WT. Key stakeholders have and will continue to shape how the sport is run at the regional level and, depending on the member country, potentially at the national level.

Figure 3.1

Oceania Taekwondo's Key Stakeholders

Referees & Judges
Coaches
Athletes
Technical Delegates
Event Management
Medical (Para TKD)
Media
Television, Radio, Press, Social Media
Spectators
Advertisers
Government
National, State / Province

Oceania Taekwondo

World Taekwondo
ONOC
Other Regional Bodies
Africa, Asia, Europe, Pan America
National Bodies
American Samoa, Australia, Cook Islands, Fed States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu
Sponsors
Daedo

3.8 The Research/Project Problem

Globally, at the time of writing, there are over 6,000 WT international referees for kyorugi and a similar number for poomsae. In the Oceania region, nearly all active WT international referees are in Australia, with the exception of two or three in New Zealand and two in New Caledonia. The distribution of WT international referees for poomsae in this region is similar. There are minimal avenues and opportunities to

develop Taekwondo practitioners in the Oceania region into referees who have the potential to officiate at the international level for kyorugi and/or poomsae. This is due to various factors, including financial constraints, geographical distances, availability and access to educational programs, lack of domestic infrastructure for referee development and the limited number of competitions in the region.

The two major events within the Oceania region are the Pacific Games, held every four years, and the regional Oceania championships, held every two years. Both require WT international referees, preferably from within the region, and WT-certified coaches to officiate. For the Pacific Games, the Oceania National Olympic Committees requires the officiating referees to be drawn from committee member countries in the Pacific region. The region also hosts regional Olympic qualification events, Oceania President's Cup and open events; these are WT-sanctioned events, and so are required to be officiated by officials—referees, coaches and competition supervisory board members—who hold current WT international qualifications.

To maintain currency in accreditation, WT international referees (both poomsae and kyorugi) and coaches are required to attend update seminars and testing, referred to as 'refresher courses'. These are run by WT and, for referees, require physically attending the seminar. For most in the Oceania region, this is both cost and time prohibitive. Currently, coach update seminars are offered online but are delivered from outside the region and so, due to time zone differences, are run in the early morning (e.g., 2–6 am) over there or four days.

The educational/accreditation programs offered by WT are aimed solely at international competition and, as previously mentioned, require participants to have reached certain levels within Taekwondo. WT does not offer domestic or regional-level education and accreditation programs, nor does WT offer pathways for stakeholders to

progress from grassroots to being eligible to attend WT accreditation programs. A regional or national body hosting a WT-run international referee seminar costs the host country/federation around US$35,000. All participant course fees and accreditation/registration fees are collected by WT. Thus, there is little chance of a positive financial return as the host country/federation is generally required to meet the majority of costs.

Within the Oceania region, there are currently very rudimentary and varying educational programs and processes. The OTU is responsible for developing the sport in the Oceania region and ensuring that athletes, coaches and officials are sufficiently accredited to participate in WT events and the region's aforementioned pinnacle events. The existing educational programs in the Oceania region provide only minimal education, are not delivered to all of the region's member countries, and, when delivered, incur considerable costs in flights, accommodation and presenter fees.

At present, only some countries use the OTU's education program, while other countries either provide their own or none. Within the Oceania region, only Australia offers its own education and accreditation programs, New Zealand has a mix of its own and some of the OTU's offerings, New Caledonia uses the educational programs of the French Taekwondo Federation, and the other OTU member countries either use the OTU's offerings or do not have any formal educational programs.

Leveaux and Kang (2021) note that the sport of Taekwondo is continually changing. Changes in interpretations and applications of competition rules are occurring at virtually every major WT competition. Yet, rule and interpretation changes are not passed down by WT to regional or national bodies. Therefore, it is increasingly difficult for stakeholders to keep up to date with these changes. For a regional or national body to access the most current information on rule changes requires their international

referees (a) attend a five-day education seminar run by WT or (b) be appointed to officiate at a major world event and acquire the information via mandatory pre-event training. However, regional and national bodies do not have input into international referee appointments for WT events. The financial costs for travel and course fees—usually in the realm of A$3,000 to A$4,000—are usually met by the attending individual. This does not include any loss of income while attending the course. WT does not provide funding for international referees and/or coaches to attend courses, and many national federations are not in the financial position to fund these expenses.

Once a regional or national body has acquired up-to-date information via international referees, there is the question of how the information is to be circulated among domestic referees and coaches. In most cases, there are no domestic processes to achieve this and the information is not disseminated. When information is distributed, it is usually via unofficial channels, leading to varied, non-standard and often contradicting narratives being received by domestic and national stakeholders. This influences officiating, competitions, game management and athlete preparation. Situations have occurred where athletes are selected into a representative team, having won a selection event under certain rules and interpretations, progressed to the next stage of competition and been confronted with radically different rules and interpretations.

In general, referee and coach education programs are run only occasionally. Some countries may only offer a course once a year, and the smaller countries in the Oceania region may have even less frequent offerings. The lack of availability of education programs and up-to-date information is a major issue for most OTU member countries.

The educational programs offered by WT and regional bodies are delivered in a traditional stand-and-deliver format, where the presenter delivers course content using everyday educational tools (e.g., PowerPoint presentations) in one- or two-hour blocks. During the height of the COVID-19 pandemic, WT offered online courses, but these also used the stand-and-deliver format.

Current assessment processes for coach and referee accreditation make minimal use of modern technologies. Feedback to participants is relatively negligible, generally limited to notification of a pass or fail result or percentage achieved.

This industry-based project with the OTU aimed to (1) address problems with the provision of coach and referee education in the Oceania region and (2) offer avenues for the region's Taekwondo participants to be eligible for referee and/or coaching accreditation with WT. The issues can be summarised as a lack of:

- a sufficient number of available, skilled educators across the OTU's member countries

- access to suitable educational programs across the region

- a standard educational program across all OTU member countries

- an accepted and recognised accreditation program across the region

- access to up-to-date interpretations and application of rules and regulations

- clear and transparent pathways for coaches and referees to progress to international accreditation.

The regional environment also presents three factors that make delivery of education in the Oceania region challenging:

- considerable cultural differences

- considerable differences in available financial resources within and between the member countries and the member countries' federations

- differing organisational structures and policies between the member

  countries and organisational issues related to the regional governing body.

Therefore, this research project addressed the question:

What is the optimal educational offering and platform to provide the best

possible coach and referee educational opportunities for the sport of Taekwondo

in the Oceania region?

In addressing the above question, there were three focal areas of interest:

- organisation—in regard to OTU and its processes, structures and

  mechanisms in relation to education

- education model—in regard to a suitable model for the Oceania region

- stakeholders—in regard to competition officials, with a focus on referees and

  coaches.

Figure 3.2 depicts the areas of interest and their inter-relationships.

Figure 3.2

Research Question Areas of Interest
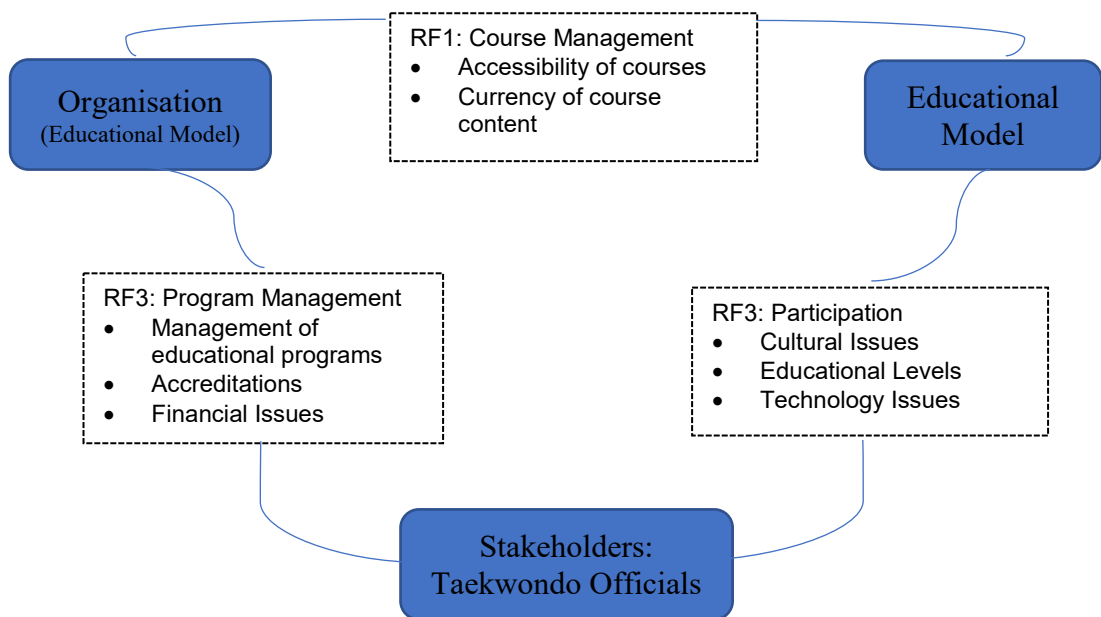
3.9 Chapter Summary

This chapter has summarised the background of Taekwondo as a martial art and sport. Both the sport and martial art have participants worldwide, with Taekwondo practitioners in over 212 countries. Taekwondo has grown from a martial art predominantly only practised in Korea to a global, Olympic-level sport contested in varying disciplines and forms of competition. Due mainly to political reasons, the sport not only has multiple world bodies but is also contested under considerably different competition rules and regulations, influenced by sources within and external to Taekwondo. These sources are broad and range from cultural factors through to compliance with internal and external organisations' requirements (national organisations, the International Olympic Committee, etc.).

Changes to sport rules and their interpretations and applications are frequent, yet there is no formal mechanism to disseminate up-to-date information from WT to regional and national bodies. The sport's integrity and continued growth depend on all stakeholders being suitably informed of changes and the current rules and interpretations. The stakeholders in the Oceania region differ from those in other regions and are hampered by various factors unique to the region. The region experiences immense problems in access to and provision of education and accreditation for coaches and referees. This project focused on addressing these problems.

The proposed model, incorporating educational technology in the education of Taekwondo coaches and referees, can benefit the Oceania Taekwondo Union by fostering a more technologically advanced approach to the development of and knowledge sharing to the region's competition stakeholders.

This approach would in turn lead to greater opportunity for athlete development, enhanced quality of training for the region's coaches, referees and athletes, potential talent identification opportunities across these stakeholders, and international competitiveness within the region. This integration can also facilitate efficient communication and knowledge-sharing among coaches and referees, further strengthening the overall Taekwondo community in Oceania.

Chapter 4: Research Methodology, Paradigm and Design

4.1 Introduction

A research design is a plan for conducting a research study. It provides the plan for collecting empirical data, analysing the collected data, drawing conclusions from analysis results and making recommendations based on these conclusions (Bloomberg & Volpe, 2012; Rowley, 2002; Yin, 2009). A suitable research design relies on the chosen research paradigm, which determines the research method and approach to data collection. This project sought to understand the lived experiences of referees and coaches in sports Taekwondo to address the research question. This chapter details the research paradigm, dimension, methodology and overall research design used to gather this data and address the research question.

4.2 Research Paradigm

Researchers select the most suitable methodology for their intended research. The methodology must be appropriate to address the research problem or question. Prior to adopting a research methodology, the methodology's ontological and epistemological assumptions must be considered and the following points determined:

- the nature of the reality in which the study will be carried out—social or natural

- the nature of the information required in the project or research

- the process in which this knowledge will be acquired and analysed.

There are suggestions that researchers are often confused by the array of methodologies and methods in research (Crotty, 1998, p. 1). Selecting a methodology that is inappropriate or ill-suited to address the research question(s) can undermine the research. To avoid this issue, Crotty (1998) suggests a researcher (1) examine the

methods and methodologies prior to selection and (2) validate the chosen research methodologies and methods. This ensures the research process is aligned with the purpose of the research. Crotty (1998) also suggests the researcher recognise any assumptions and knowledge they bring into the research and identify the new knowledge they hope to obtain through the research. This can be surmised in four considerations for the researcher prior to commencing the research:

- What methods will be employed?

- What methodology governs the selection and use of the chosen methods?

- What is the theoretical perspective behind the selected methodology?

- What epistemology informs this theoretical perspective?

Elaborating on these considerations, Crotty (1998) offers the following definitions:

- *Methods* are the techniques and/or procedures used to gather and analyse the collected data in relation to the research question.

- *Methodology* is the strategy, action plan, process or research design that lies behind the selection and application of certain methods and links the selection and use of methods to the desired research outcomes.

- *Theoretical perspective* is the philosophical perspective informing the methodology and subsequently provides a context for the process and grounding its logic and criteria.

- *Epistemology* is the embedded knowledge in the theoretical perspective and in the methodology (Heylighen, 1993). Epistemology is a way of explaining and understanding the 'how we know what we know' (Crotty, 1998, p. 8).

Burrell and Morgan (2017) propose that the dimension of ontology needs to be examined prior to commencing a research project. Ontology relates to the nature of the reality in which the research is being carried out. Crotty (1998) states that epistemology

and ontology together express a certain way of thinking or understanding. Epistemology

provides a certain way of understanding *what it means to know*, while ontology

expresses a certain way of understanding *what is*.

Case and Light (2011) stress that despite there being no single correct

methodology or set of methodologies, there is correct (and incorrect) *selection* of

methodology. The research question(s) being asked determines the methodology

selection. The four basic research elements are related and interconnected, each

informing the development of the next element, as illustrated in Figure 4.1. These

elements are not separate processes and none can be used in isolation as the sole basis

for a research project. Therefore, it is necessary for the researcher to have suitable

ontological and epistemological assumptions embedded into their chosen research

methodology. Appropriate assumptions are determined by the research aim(s) and

question(s).

Figure 4.1

Relationship of the Four Basic Research Elements (Crotty, 1998, p. 4)
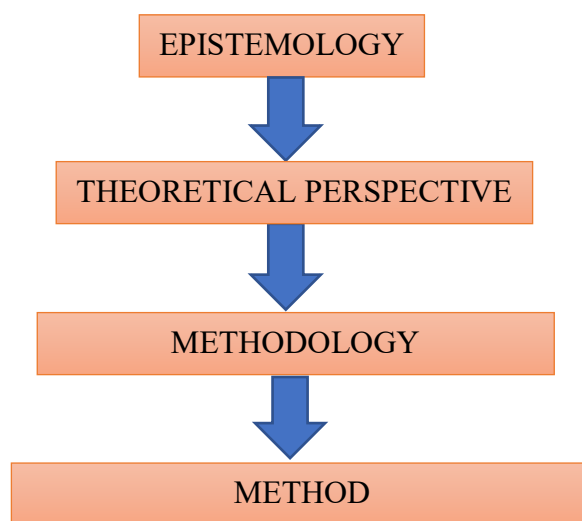
4.3 Research Dimension

This research aimed to discover the nature, needs and extent of the phenomenon of sports Taekwondo referee and coach education in the Oceania region. The researcher needed an appropriate strategy to fulfil this aim. A researcher can follow one of two approaches—subjective or objective (see Table 4.1)—and the appropriate assumptions (as determined by the research aim and question) will determine the appropriate approach.

Table 4.1

Subjective/Objective Dimension (Adapted From Goles & Hirschheim, 2000, pp. 252–253)

Assumptions	Subjective	Objective
Ontological	Reality is interpreted by the individual. It is socially constructed (nominalism).	Reality is external to the individual. It is a 'given' (realism).
Epistemological	Knowledge is relative. Researchers should focus on meaning and examine the totality of a situation (interpretivism).	Researchers should focus on empirical evidence and hypothesis testing, looking for fundamental laws and causal relationships (positivism).
Human nature	Humans possess free will and have autonomy (voluntarism).	Humans are products of their environments (determinism).
Methodology	Understanding the world is best done by analysing subjective accounts of a situation or phenomenon (ideographic).	Operationalising and measuring constructs, along with quantitative analysis techniques and hypothesis testing, will uncover universal laws that explain and govern reality (nomothetic).

4.4 Ontology

It is necessary to make ontological assumptions regarding the research setting, the sport's education process and the learning experiences of individuals who participate in the education process. It must be determined whether the research follows the principle of nominalism or realism.

Nominalism maintains that social reality does not independently exist of human cognition and to structure our actions, names, concepts and labels are applied to negotiate the created social constructs. Reality is interpreted by the individual.

Realism emphasises that social reality exists independently of human volition and is made up of hard, tangible and relatively immutable structures (Burrell & Morgan, 1979). Reality is a given and is external to the individual. Education in sport Taekwondo has a certain physical presence. This consists of individuals, space or locations, and equipment. These tangible things only constitute an educational program when they are bound together by a common purpose—the delivery of education for referees and coaches. There are certain attributes that are tangible and measurable and enable the comparison of one educational program to another. This includes quantifiable components such as staff/educators, course duration, individual class size and allocated budget. This project is not concerned with comparing measurable statistical data but rather with gain insight into the educational experiences and requirements so as to construct knowledge.

Participants in Taekwondo educational programs are exposed to, experience and participate in activities that build knowledge and skills. As it is not possible to see an educational program or experience the individual learning that takes place within it, the phenomenon can only be researched via words and labels. Therefore, this project adopted the nominalist ontology.

4.5 Epistemology

Epistemology is the study of the nature of knowledge (Crotty, 1998; Steup, 2006) and is concerned with the issues surrounding the creation and dissemination of knowledge. Crotty (1998, p. 8) further states epistemology is a way of understanding and explaining 'how we know what we know'. Myers and Newman (2007, p. 3) argue that epistemology refers to the assumptions about knowledge and how it is gained.

To discover the knowledge sought for this project, it is necessary to make an assumption regarding the nature and form of the knowledge itself and whether the existing knowledge is a subjective notion or in objective form. Knowledge existing in objective form can be measured by relevant technologies and human senses, whereas a subject notion exists in the minds of the people who have experienced the phenomenon (in this case, the phenomenon of sports Taekwondo educational programs).

The nature of the knowledge sought in this project relates to experiences and not metrics associated with the educational programs. The answers being sought relate to '*what was the experience like and what did you learn*' rather than '*can you describe how the educational program was organised*'. The researcher sought tacit knowledge, in that it exists only in the minds of participants who have experienced the phenomenon and is not readily codifiable. The learning associated with sports education is experiential and an example of education that occurs through direct participation in the events of life (Houle, 1981; Weber, 2004) and with everyday experiences.

4.6 Human Nature Assumptions

A researcher must decide on the human condition: are humans products of their environment, where their nature is completely determined by objective structures of natural reality (determinism; Burrell & Morgan, 1979), or do humans, by their volition and their ability to make decisions and choices, construct the nature of social reality

(voluntarism). Taekwondo educational programs are a subjective construct that have a nominal existence to facilitate human interaction with respect to specific human life interests. They have been created out of a series of choices and decisions. Therefore, this project subscribed to voluntarist assumptions regarding human nature.

4.7 Theoretical Perspective

In the interpretive approach, the researcher 'looks for culturally derived and historically situated interpretations of the social life world' (Crotty, 1998, p. 67) and undertakes 'systematic analysis of socially meaningful action through the direct detailed observation of people in natural settings in order to arrive at understanding the interpretations of how people create and maintain their social world' (Neuman, 2000, p. 76, as cited in Mawson, 2013). Using the interpretive approach enables the researcher to understand the phenomenon being researched at the source and allows a deep understanding of the phenomenon from those who have lived and experienced it. Neuman (2013) states that interpretive research has the two primary goals of developing an understanding of social life and discovering how people develop meaning in natural environments. Interpretive research provides the researcher with data that are rich, compelling and have considerable substance and depth (Denzin, 2002; Fish, 1990). Denzin additionally notes that the participants must have 'experienced the types of experiences the researcher seeks to understand' and must 'elaborate and further define the problem' (2002, p. 350).

This project aimed to understand the investigated phenomenon from participants' perspectives; therefore, this project used the interpretivist paradigm. The intention was to gain a deep understanding of participants' lived experiences from their perspectives, within the framework of sports Taekwondo referee and coach education.

Morse and Richards (2002) recommend the following criteria when considering interpretive research:

- Is the research attempting to gain an understanding of a phenomenon of which little is known or where there is inadequate current understanding?

- Is the research attempting to make sense of a current complex situation(s), multi-context data, changing and shifting phenomena, requiring the managing and simplifying of data without destroying complexity and context are needed?

- Is the intention of the research to understand how participants experience the phenomenon being researched, the meaning they attribute to that experience, and how they interpret that experience?

This project aimed to understand the investigated phenomenon from participants' perspectives and gain an understanding of the complexities in and around the current educational offerings. Therefore, the interpretive paradigm was chosen for this research.

4.8 Research Methodology

As noted in Section 4.2, a research methodology is a strategy for conducting a research study (Crotty, 1998). The methodology leads to the selection of the methods to be used in the research and aligns these with the desired research outcomes. In the interpretive research paradigm, there are three distinct research methodologies: grounded theory, ethnography and phenomenology (Babbie, 2015; Crotty, 1998; Morse & Richards, 2002). The researcher had to determine the most appropriate methodology for collecting participants' learning experiences of sport Taekwondo educational programs.

As previously stated, the ontological and epistemological assumptions of this project mean an appropriate methodology will be within the interpretive paradigm. As the knowledge sought in this project is qualitative and subjective in nature, grounded theory, ethnography, case study and phenomenology are potentially suitable methodologies. These methodologies consider that knowledge can only be gained through:

- empathic observation, where the researcher observers the phenomenon and gains insight into the perspectives of those experiencing the phenomenon

- participation, where the researcher gains insight through personal experiences of the phenomenon

- empathic interpretations, where, through creative imaginations, the researcher gains an understanding of the phenomenon

- human communication via semi-structured and/or in-depth interviews.

These methodologies are discussed below.

4.8.1 Grounded Theory

Grounded theory can be viewed as a form of interpretive inquiry that develops theories representing patterns emerging from iterative, qualitative field research (Gephart, 1999; Strauss & Corbin, 1990). Urquhart (2016, p. 2) states that the 'aim of grounded theory is to generate or discover a theory', as explained by Creswell (1998) and Dey (1999). Theory progressively emerges directly from the data through inductive reasoning. Each new finding acquired through fieldwork, interviews, observations and documents about the phenomenon of interest is compared to the evolving theory and used to refine it. 'Further data collection or sampling is based on emerging concepts', and 'these concepts are developed through constant comparison with the additional data' (Urquhart, 2016, p. 2). Once the point is reached where no new conceptualisation

occurs, data collection may cease. In essence, the goal of grounded theory is the generation of theory rather than verification of theory (Corbin & Strauss, 2014; Glasser & Strauss, 1967).

While grounded theory offers possibilities for this research discipline, it has limitations in relation to this project. This project was focused on gaining a deep understanding of the phenomenon of learning for referees and coaches and associated issues, and was not seeking or developing a theory. Therefore, grounded theory was not considered appropriate for this project.

4.8.2 Ethnography

Ethnographic research is centred on investigating and understanding a phenomenon through a deep immersion in the research environment or the context of its culture. The researcher endeavours to understand the social and behavioural norms and heuristics within the research setting over an extended period (Goulding, 2005). During this period, the researcher becomes intimately involved and engaged in the day-to-day operations and/or activities related to the phenomenon. The primary method of data collection is via the researcher's observations and record-taking. The focus is on the daily life of the studied culture, environment and participants in their normal settings (ER Services, n.d.), enabling the researcher to record firsthand the patterns of knowledge creation and learning (which evolve during the period of immersion). Through extensive fieldnote-taking and detailed descriptive narrations, the researcher provides a means for sharing the cultural experience.

The researcher expected this project would explore a broad range of experiences across different cultures, socio-economic environments and regions. Thus, an ethnographic approach would potentially limit the scope of the project. Additionally, the limited time frame for project completion, availability of and access to participants, and

participants' locations presented substantial practical issues that precluded the researcher from joining the participants for prolonged periods. Therefore, ethnography was not considered appropriate for this project.

4.8.3 Phenomenology

Phenomenology involves the study of lived experiences through fresh, complex and rich descriptions of the phenomena (Finlay, 2013). Data are gathered via persons who have experienced the phenomena. Phenomenology seeks to make explicit the structure and meaning of human experience and focus on going directly to the pure and unencumbered version of what the experience(s) really is (Finlay, 2012; Sanders, 1982). Human experiences occur within a complex environment or lifeworld consisting of other people, communities, objects and social structures. Humans apply meaning to these based on cultural context, previous experiences, mood and both former and current state of being, and the essence of participants' views and lived experiences is primarily communicated via language (Goulding, 2005).

Phenomenological research is conducted with carefully selected participants who have lived or are living the phenomena firsthand and have a deep understanding of it. Through in-depth interviews using open-ended and probing questioning, the knowledge being sought is accessed and made explicit. Phenomenology provides a pathway for eliciting a type of embodied knowledge that may not be realised by the participants prior to being interviewed (Fulton Suri, 2005).

With phenomenology, while conducting the research, the researcher must suspend, as far as is humanly possible, all personal preconceptions and presuppositions regarding both participants and the matter being researched, to limit or minimise any contamination of the knowledge being accessed (Ardley, 2005; Sanders, 1982).

For this project, phenomenology was considered a suitable methodology to enable meaningful understanding of the lived experiences of referees and coaches. Bindeman (1998, p. 206) noted that researchers accessing similar types of embodied knowledge identified phenomenology as 'most appropriate to the study of human activity'. Park Lala and Kinsella (2011) state that phenomenology 'offers a rigorous methodology capable of "noticing" and of generating unique contributions and significant insights' (p. 206). Therefore, phenomenology was chosen as the methodology for this project.

4.9 Research Method

The goal of qualitative research is to gain a deep understanding of participants' experiences by transforming tacit knowledge into abstract explicit knowledge relating to the subject of the research (Merriam & Tisdell, 2015; Miles & Huberman, 1994). In this project, the key assumptions and project aims determined phenomenology as the most suitable methodology. Phenomenology offers a range of data collection methods: participative observation, case studies, focus groups, conversational analysis and interviews.

The most appropriate method(s) is (are) that (those) that will enable the development of a rich understanding of the phenomenon of sport Taekwondo learning and education for referees and coaches. Therefore, in-depth interviews were chosen as these would best facilitate gaining insights from those with lived experience. Interviews were conducted with carefully selected participants who have experienced the phenomenon and are able to articulate these experiences, to allow the interpretation and sense-making of their experiences. Tacit knowledge was acquired through in-depth interviews employing phenomenological interviewing techniques, including probing, empathetic questioning and sensitive listening.

Due to the researcher's prior and ongoing involvement and experience in the sport and associated acquaintance with the participants, the suspension of all preconceptions about the subject matter and participants was crucial.

The process of choosing the research methodology, discussed through Sections 4.2 to 4.8, is summarised in Figure 4.2.

Figure 4.2

Research Methodology Selection
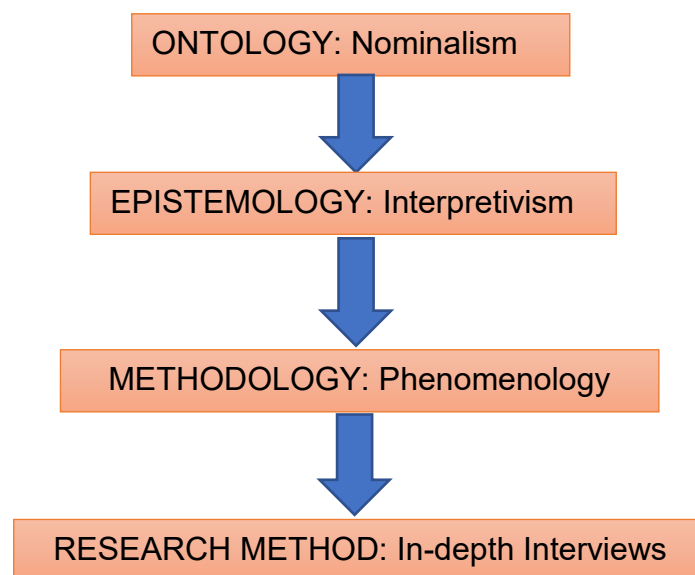
The significance of the knowledge required for this project lies in the aim of facilitating a deep understanding of the culture of learning in sport Taekwondo at the regional and global levels and participants' experiences and needs in sports Taekwondo educational programs. After determining the research methodology and methods, suitable research participants/interviewees were sought. This is discussed in Chapter 5.

4.10 Chapter Summary

This chapter has detailed the research design adopted for this project. The phenomenological approach was determined to be the most appropriate methodology for collecting the necessary data to achieve the research aims. The research used a

phenomenological methodology within the interpretive research paradigm. In-depth interviews were chosen as the method. The next chapter discusses the research method, including interview design, recruitment of participants, data collection and analysis, ethical considerations, and study trustworthiness and limitations.

Chapter 5: Selection of Research Subjects and Research Method

5.1 Introduction

Following the previous chapter's description of the adopted research design and methodology, this chapter discusses the recruitment of participants, interview design and refinement, data collection and analysis, ethical considerations, and study trustworthiness and limitations.

5.2 Selection of Research Subjects

All participants in a phenomenological study are expected to have experienced the phenomenon being explored and be able to clearly describe or explain their experiences (Creswell, 1998). While there are common factors influencing all referees and coaches, some factors have greater impact and are considered potential inhibitors to participation in the education process.

Referees and coaches officiating at the international level of Taekwondo typically do not rely on this as their primary source of income. Taekwondo officials come from a broad range of backgrounds and careers, including manual skilled and unskilled labour and professional, managerial and administrative workers. This project aimed to gain insights into the experiences of a wide range of referees and coaches to help address the research question.

5.2.1 Profile of Research Participants

This project aimed to develop a deep understanding of the lived experiences of Taekwondo referees and coaches in learning and educational programs. The research initially focused on recruiting participants in the Oceania region. However, it became evident that the factors affecting these participants' experiences were shared by referees and coaches in other regions. This commonality and the very limited number of suitable

participants in the Oceania region prompted the researcher to recruit suitable participants from other regions. This also had the benefit of providing a wider and richer understanding of the factors affecting educational programs and their participants.

Referee and coach participants come from within the sport of Taekwondo. Noting the certification and accreditation system discussed in Chapter 3, it would not be possible to become an international referee or international coach externally to the sport. All referees and coaches would have learned the martial art and progressed, either totally or partially, to the competitive side of the martial art. Those coaching at the elite or international level would typically have been involved in sport Taekwondo for a minimum of three to four years. Those commencing as an international referee would have been involved in the sport for over 12 years prior, during which they would have progressed through their respective national or regional refereeing ranks.

The participants in this project all had a range of roles within the sport, which is not uncommon. For example, many international coaches also hold international referee qualifications, and depending on the event, they may participate either as a coach or referee (though they may not participate in more than one of these roles in the one event). Patton (2002) indicates the selection of appropriate participants that are information-rich with respect to the topic being researched is preferable. To address the variations in roles, the following inclusion criteria were applied in the recruitment of participants:

1. Extensive involvement in the sport as a referee and/or coach both domestically and internationally. (Mandatory)

2. Extensive involvement in the sport's education as a referee and/or coach both domestically and internationally. (Mandatory)

3. Significant recognition in the sport in their home country. (Mandatory)

4. Involvement in the educational framework(s) in their home country and region and/or at the global level. (Optional)

5. Educational committee experience in their home country and/or region. (Optional)

All participants were required to satisfy the first three criteria. Ultimately, all participants satisfied the first three criteria and one or both of the fourth and fifth criteria.

A mix of participants was selected: those participating in the sport (a) solely as referees, (b) solely as coaches and (c) both as referees and coaches (see Section 5.2.2). Recruitment aimed for an equal or near-equal gender mix (see Section 5.2.3). Boyd (2001) and Groenewald (2004) state that in a phenomenological study, two to ten participants may be sufficient to reach saturation. This is additionally supported by Creswell (1998). Crabtree and Miller (1992) stated a sample size of six to eight may be sufficient. Holloway aligns with this by indicating that in interpretive research the pool of those participating is relatively small.

This project's initial target was six participants who met the inclusion criteria. Only coaches and referees at the international level were targeted for recruitment as they would have the extensive in-depth experiences sought by this research. By only selecting these individuals, the researcher was able to gain meaningful and rich insights into experiences across the domestic and regional educational structures and life experiences leading to and including participation at the international level.

Data saturation was not achieved with the initial pool of six participants; therefore, additional participants were recruited and interviewed. The final sample comprised 12 participants. Data saturation was achieved after the ninth interview, and an additional three interviews were conducted to confirm saturation.

Table 5.1 lists participants' genders and roles within the sport. It was not uncommon for participants to hold both refereeing and coaching roles and qualifications, even at the elite level. Most also taught Taekwondo classes or worked as full-time instructors. As stated in Section 5.2.1, participant selection aimed to ensure a fairly even distribution and representation of roles and genders.

Table 5.1

Research Participant Gender and Roles in the Sport

Participant	Gender	Officiating role	Other roles in Taekwondo
Participant A	Male	International Referee	National body CEO Referee Chair for international body
Participant B	Male	International Referee	Club instructor National body education committee member
Participant C	Female	International Referee International Coach	Club owner and instructor
Participant D	Male	International Coach	Regional body executive committee member
Participant E	Female	International Referee	Club instructor
Participant F	Male	International Referee	Club owner and instructor National body education committee member
Participant G	Female	International Referee International Coach	Club owner and instructor
Participant H	Male	International Referee International Coach	Club owner and instructor
Participant I	Female	International Referee International Coach	Club owner and instructor
Participant J	Male	International Referee	Club instructor Regional body education committee member
Participant K	Female	International Referee	Club instructor National body referee committee member
Participant L	Female	International Referee	Club instructor

The participants who also held committee positions were spread across different countries and differing regions. Not all club owners ran their club as their primary source of income; the sample included participants running their club as their primary source of income (Participants E, F and I) and participants doing so as a secondary source of income. It was necessary to achieve a mix of club owner participants; those who rely on the sport as their primary source of income are financially affected when officiating internationally, so their experiences are potentially influenced by this factor.

While the sample may appear to be weighted towards international referees, as previously stated, it is common for national and international coaches to also attend international referee seminars and thereby gain international referee accreditation.

5.2.3 Gender Divide

WT is striving for gender equality across all aspects of the sport and in committee structures and is encouraging its regional bodies to follow suit. WT is focused on equal male and female representation at all world championship events. This can be traced back to the 2012 London Olympic Games, where there was equal representation of male and female international referees. Therefore, it was important to ensure the life experiences of female referees were represented in this project. Although female representation at the international level in the Oceania region is not high compared to other regions, this project achieved an equal gender divide for all interviewees and interviewees from the Oceania region.

5.2.4 Sourcing of Participants

Potential participants were contacted via direct contact, referrals and the OTU (the industry partner). As the researcher has been involved in the sport for over 45 years (including 36 years at the international level as an international referee, national team manager and selector) and holds positions on national, regional and global committees,

the researcher had an existing extensive network of contacts in the sport (over 120 persons globally). Using the researcher's existing network, suitable contacts were initially contacted via telephone and social messaging/media platforms (including WhatsApp and Messenger) to gauge their interest in participating in the project. This also led to referrals to other potential participants. Referrals were also made through the regional body and executive members of the regional body. Where an individual expressed interest in the project, they were provided with an invitation email and further details on the project. Only individuals with the desired credentials (see Section 5.2.1) were contacted. Most agreed to participate. The small number who declined to participate cited personal commitments and/or timing issues as precluding their participation.

5.3 Ethical Considerations

This project is supported by industry, through UTS's IDP, and involved human participants during data collection and during consultations and work with the OTU (the industry partner). This necessitated obtaining ethics approval for the project.

The project principally involved people from within the Oceania region and from some of the sport's other regions, across multiple cultures and within a regional organisation where the researcher holds executive committee positions. The ethics application needed to address:

- interviews and fieldwork being conducted in multiple locations outside of Australia

- management and respect of differing cultures within and external to the region

- conducting the project with an industry partner not solely operating in Australia

- possible conflict due to the researcher's committee positions and roles within the industry partner organisation.

The researcher addressed these areas and additional concerns raised by the UTS ethics committee. The project was assessed as not high risk, and ethics approval was granted on 1 May 2017 (approval number: UTS HREC ETH17-1287). Ethics approval was obtained prior to data collection commencing.

5.3.1 Consent to Participate

An agreement was signed between UTS, the OTU (the industry partner) and the researcher. This agreement included a requirement for annual reporting to the OTU on project progress. The OTU is involved in many facets of the sport's major events (e.g., world and regional championships, general assemblies, meetings, etc.) and was integral in providing the researcher with access to data (i.e., relevant materials, reports and organisation meetings) and relevant personnel.

This work involved human participants during the data collection stages and during consultations and work with the OTU (the industry partner). Informed consent was obtained from the industry partner and participating individuals.

Suitable individuals were invited to participate in the project. They were informed that participation was wholly voluntary and were given the opportunity to decline. The nature of the project was explained to each participant, including the reasons behind the project, how the project would be carried out, who would be involved in the project, and how and to whom the collected data and findings would be made available. All participants were provided with a Participation Information Sheet (see Appendix D) and signed a consent form prior to being interviewed. Each participant was asked at the commencement of their interview if they agreed to the

interview being audio-recorded (see Appendix E). Participants were again informed they could withdraw from the project at any time without consequence.

Participants were assured that the interviews were purely for research purposes for this project and all collected data would be confidential. Cohen et al. (2017) note that the greater the sensitivity of the data being sought and/or collected, the more safeguards are required to ensure the anonymity of participants. In this project, no personal or identifiable information was collected, and privacy and due ethical considerations were observed to ensure the anonymity of participants. Participants were informed that data would be de-identified and there would not be any associations and/or impact on the individual (either within their body/organisation or external to their body/organisation). Their details cannot be attributed to any individual or regional body/organisation by name; however, data may be attributed to an individual's role within the sport, or in the case of a regional body outside of the Oceania region, attributed to a generic name (e.g., Region A).

Participants were requested to provide responses only in relation to their individual experiences and ongoing practices regarding education in the sport. Any responses, references or viewpoints outside the scope of this project were not considered in data analysis. The researcher was able to gain meaningful and useful responses and in-depth understandings of the subject areas using common sense, cultural respect and moral responsibility.

5.3.2 Confidentiality

The data collected and used in this project were focused solely on participants' roles or functions within the sport and the regions in which they reside, as recognised by WT (the sport's world governing body). All interview data were de-identified to maintain the confidentiality of participants and ensure that no detail provided in this

project could be identified to any particular individual or organisation. The interviews, transcripts and fieldnotes were sanitised to remove any identifiable personal or organisational elements; subsequently, no individual data were identifiable, ensuring there is no avenue to trace any single contribution or individual once the data were processed. Confidentiality was discussed with all participants and agreed upon, with participants signing a consent form prior to being interviewed.

5.3.3 Relationship With Participants

As the researcher is well known in the sport and holds several positions in the sport at the global, regional and domestic levels, they had an existing professional relationship with all participants. All participants were assured that the researcher's role in this project was purely the position of a researcher and that the researcher's position(s) within the body/organisation had no bearing on the project outside of the researcher being able to create a deeper level of trust and working relationship with individual participants. All participants were assured of the confidentiality of all information gathered and that no individual or identifiable information or data would be provided to any persons or bodies either within or external to the sport.

5.4 Data Collection Process

To address the research/project problem, this project required the researcher to gather data on the lived experiences of referees and coaches in sport Taekwondo from those who have experienced the phenomenon. In-depth phenomenological interviews were determined as the best method to gain a broad and in-depth understanding of the relevant issues and problems (see Chapter 4). Interviews were the primary source of data. A secondary source of data was the researcher's observations at various educational offerings in the form of formal educational seminars and pre-event educational debriefs.

5.4.1 Data Acquisition Timetable

Due to the nature of the project, the opportunities for access to and availability of interviewees, and the timing of the identified international events for the project's fieldwork, data collection (interviews, observations, etc.) was conducted over an 18-month period commencing in May 2017.

The research problem necessitated the examination of the current standard offerings of educational programs and mandatory pre-event educational programs delivered prior to any of the sport's major events (including world championships and/or regional championships). Championship events are held every second year, with Olympic Games and regional multisport events such as the Pacific Games being held every four years. The sport's educational programs are conducted in two modes:

- by WT (the world body) over a four-day period, several times a year, in differing locations—usually once a year in each of the five regions, or, for the Oceania region, over one day, on an ad hoc basis, and dependent on numbers of participants

- immediately prior to all international and major events, ranging in duration from a few hours (with events such as international open championships) to three days (prior to world championships).

5.4.2 Interview Method

The interviews were conducted at locations that suited the participants and entailed as minimal inconvenience or intrusion as possible. Initially, there was the potential for logistical challenges in interviewing participants due to the international representations. There was the potential need to travel to various countries, or potential time zone issues if conducting online interviews. Therefore, interviews were conducted at or around international events that the participants attended or officiated in, such as

international referee seminars, international opens and world championship events. These events all run over several days to two weeks. Conducting the interviews during these periods meant little or no travel impact or inconvenience to participants. As all participants had extensive experience of international competitions, these environments were not foreign to them. Due to participants' levels of participation in the sport, they were already comfortable and familiar with communicating with and talking to people from other countries and cultures (Leveaux & Kang, 2021).

While interviews were ideally conducted in a quiet and private location, this was not always achievable due to the availability of interviewees. Where possible, interviews were conducted in environments that catered to respect interviewees' culture and privacy. All interviews were conducted in a manner that allowed interviewees to provide meaningful insights into their world. The knowledge being sought could only be gained through direct and open communication with interviewees. The primary goal of an interview is to deeply probe and delve into the experiences of interviewees (Cohen et al., 2017). In this project, the objective was to extract from each interviewee their individual life experiences in relation to the sport's referee and coach education. This tacit knowledge would then be converted into abstract explicit knowledge to gain a deep understanding of the problems and issues relevant to the research problem.

As participants, in general, are familiar and comfortable with qualitative interviews compared to other data-gathering techniques (Cassell & Symon, 1995), the interviews were conducted in an open conversational mode. The interview questions focused on individuals' experienced phenomena and drawing out their individually independent interpretation of their referee and/or coaching education experiences and recollections. The questions were not leading but rather open and empathic; they encouraged interviewees to draw on and explore their experiences. Interviewees were

encouraged to be open, frank and not withhold any information. Interviewees were reminded that the researcher was interviewing them from the viewpoint of a researcher and not his current position within WT. Every effort was made to avoid questions that may have been leading or suggestive; Goulding (2005) states this is vital to ensuring interviewees' responses are not coloured or influenced by the interviewer's questioning.

The interviews also explored any cultural and or relationship issues, problems encountered and decisions the interviewee may not have had any control over that may have affected or influenced their educational experience in the sport or their outcomes from educational programs. The interviews aimed to gather information that was rich, significant and representative. All interviews were audio-recorded and lasted approximately 35 to 45 minutes.

5.4.3 Questioning Technique

Each interview commenced by reconfirming with the interviewee their permission to audio-record the interview. The interview proper commenced with the same opening question for all interviews: 'In relation to your Taekwondo referee (or coach) education, what is the most memorable experience you have had?' This provided the interviewee with an invitation to reflect on both their own personal experience or an experience that affected them and to reveal those reflections and observations. As the interviewee responded, the researcher took notes and highlighted matters of interest the researcher wished to explore further. So as not to restrict the exploration of the interviewee's life experiences, the researcher intentionally held back from exploring other areas of interest until the interviewee appeared to have reached the end of that response. On occasions, to build a more complete picture, it was necessary to ask more probing questions to further explore a particular aspect. When appropriate, and to enable building a more complete picture, the researcher would ask further probing questions

such as 'Can you tell me more about …?', 'Could you explain further on …?' and 'Could you give me an example of what you meant by …?'.

In some instances, the interviewee raised several matters of interest in one response. On these occasions, the interviewee was given free rein to complete the initial response, and then, when the initial response was exhausted, the researcher drew back on the earlier but unexplored areas by asking, 'Earlier, you mentioned [area of interest], could you tell me more about …?'. These questions often opened up a new line of discussion to be explored.

By following this process, the researcher was able to capture the interviewees' memories and factors influencing their lifeworld experiences. Additionally, it provided descriptions and outcomes of a range of factors, including cultural and relationship issues, encountered problems and decisions that influenced the participant. This approach yielded full, rich material containing many significant quotations and anecdotes relating to individual experiences.

All interviews were audio-recorded using a digital voice recorder and then transcribed. Notes were taken during all interviews, and as the interviews were being refined, an interview checklist was used to ensure that all the essential aspects were being drawn out. The fieldnotes consisted primarily of notations of differing areas of interest to be explored and any nuances and factors surrounding an interview.

5.4.4 Refining the Interview Technique

The interview techniques were improved and refined over several interviews. Due to the researcher's background and involvement in the sport, the more difficult aspect of conducting the interviews was suspending the researcher's own experiences and knowledge of the research area to ensure that the interviewee was responding with unbiased responses. It was found that more open questions led to a much wider

discussion of the interviewee's experiences. While early interview content was entirely valid, later interviews had greater depth and richness.

An early limitation was identified in the first interview, where the researcher attempted to interview without a clear checklist of key elements. Following this, a checklist was developed to ensure that interviews addressed the key elements (see Table 5.2). Use of this checklist ensured clearer and more complete responses and so greatly reduced the need for supplementary/post-interview contact.

Table 5.2

Interview Checklist

Positive aspects of current referee/coaching education programs	Cultural issues and barriers
Negative aspects of current referee/coaching education programs	Relationships – referee: referee
Positive experiences with refereeing/coaching	Relationships – referee: coach
Negative experiences with refereeing/coaching	Relationships – individual: organisation and any other
Organisational structure(s), issues and factors	Rule and interpretation changes
Communication, meetings and seminars	Propagation of knowledge into referee/coach/athlete community
Feedback	Evidence of coaching or mentoring practices
Location(s) and logistics	Desirable aspects for referee/coach education program

5.4.5 Observation

The collection of data through observation is well recognised as a valid means of collecting data (Mirhosseini, 2020; Yin, 2014). Depending on the research project, there

are differing levels of observation (Waddington, 1994) and participation by the observer (Lee et al., 1999). Lee et al. (1999) indicate that observation will allow data to be understood in its organisational context and, as such, provides the researcher, in the context of the research project, an avenue to observe and gain insights into the life experiences (Kawulich, 2012) as described by the interview participants and thereby become more intimate with the interviewees' experiences.

Taylor and Bogdan (1994) suggest that observers, even if minimising their effect on the organisation—and in this project, the participants and current educational programs—they do often influence the setting of the study. This did not occur, or was very minimal, in this project as the researcher used existing opportunities to attend pre-event referee training sessions, coach debriefs and educational programs purely to supplement the interview data and solidify understandings of the participants' life experiences. The list of attended events is provided in Appendix F.

Observations provided the researcher with substantial secondary data, providing a richer picture of both interviewees' experiences, the educational offerings to referees and coaches at the differing levels of international competition, and the formal educational programs for referee and coach qualifications.

Observations were open and unobtrusive. The timing and amount of observation varied depending on the individual event. Observational data were recorded in fieldnotes during and following each event. The collected data were related purely to the educational program or debrief and not the observation of any participating individuals. As interviews were held in the same locations and events as the observations, the observations were validated with interviewee participants at the event to ensure the event was properly understood (Marshall & Rossman, 1999).

5.4.6 Data Security and Storage: Data Management Plan

All collected data (primary and secondary) were stored as per UTS's Research Data Management Plan (Stash). The plan was developed at the time of seeking ethics approval and lodged with the ethics application. Data were stored on UTS's servers, per UTS policy. A backup of all collected data was kept on a removable device (an external hard drive) and stored off site in a locked filing cabinet/safe at the researcher's residence.

All fieldnotes generated during the data collection phase were scanned. One PDF copy is stored on the UTS server and a backup copy is stored on the same removable device as the collected interview data. The original hard copies are stored off site with the removable device in a locked filing cabinet/safe at the researcher's residence.

5.5 Data Recording Procedures

All interviewees gave full consent to have their interview audio-recorded. Recording was done using an audio recorder and supported by notetaking. A backup voice recording was available, though not required, via the recording facility on the researcher's mobile phone.

Notes taken during the interviews included observations of relevant body language, such as facial expressions, gestures and changes in body position. Notes taken during observations of educational events and pre-competition debriefs or training sessions focused mainly on the structure and content being offered at the sessions.

5.6 Data Analysis and Interpretation

Interviews were transcribed to provide an accurate record of interviewees describing their experiences and recollections. A summary of each interview was prepared to record any nuances and points of note. The interview transcripts were

carefully examined to extract units of interest. Units of interest have also been referred to as *units of meaning*, *units of analysis* or *significant statements* by other phenomenological researchers (Ardley, 2005; Goulding, 2005; Rowley, 2002); however, units of interest more accurately reflect this project's concern with identifying relevance and establishing importance rather than trying to determine meaning from the data. Hermeneutic interpretation (see Section 5.6.2) was employed to gain an understanding of each unit of interest in relation to the educational experience and to classify the units of interest for the purpose of identifying common themes (see Figure 5.1).

Figure 5.1

Data Interpretation Process
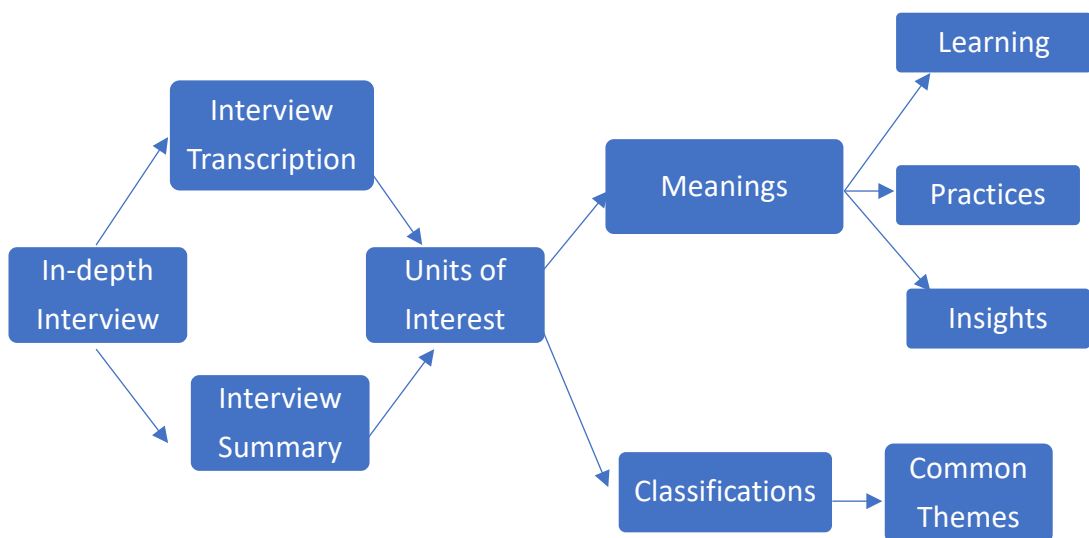
5.6.1 Units of Interest

The unit of interest is the major entity being analysed in a study or research. The unit of interest may be an entity with experience(s) of interest in relation to the research, an individual, an event, an organisation, or possibly a social or implementation process (Myers, 2013; Rowley, 2002). Person-specific and organisation-specific characteristics

influence the successful use of information (Lybaert, 1998); this may be applied in the present project context to an educational program. While an organisation is the provider of the education program, it is the individual, rather than the organisation, that serves as a focal point to the acceptance of an educational program and this 'serves as the "focal" point, around which all business activities are centralized' (Lybaert, 1998, p. 188) and becomes a strategic position of the education provider.

This project focuses on the use and take up of education for referees and coaches for individuals within the organisation(s); therefore, the unit of interest in this project is at the individual level. The project required the examination of the educational offerings at the different organisational levels within the sport to gain a base understanding of the current offerings. Further, officiating in an international event requires referee and coaching accreditation achieved via certification through attending applicable courses and meeting assessed standards. However, many factors affecting the uptake of education lie primarily at the individual level, as factors external to the organisation are often the primary determinant of the likelihood of referees and coaches taking up the education. The organisational input into the education is the provision of and management of the delivery of the education.

Each interview was transcribed verbatim, and the transcripts were read several times prior to being critically examined and evaluated to extract elements or units of interest. This was followed by carefully examining printed copies of each transcript and notating them. The transcripts were developed into narratives of each interview, which were loaded into nVivo and further examined. Narratives are 'intellibile products that can be read, edited for accuracy, commented on and analysed' (Welman et al, 2005, p. 211). Units of interest were identified by various indicators, including:

- an account of cultural, personal or organisational issues influencing the learning process

- the impact of changes to competition rules on referees and coaches and at the organisational levels

- the expression of an opinion relating to the sport's education or the organisation in relation to education delivery

- an account of how changes to the sport are created and how the learnings associated with changes are achieved at both the individual and organisational levels.

Lists of units of interest in each interview were manually compiled as units became evident and were identified. There was no interpretation during the extraction of units of interest, and the recorded units were collated as articulated by the interviewee. Upon completion of the extraction of the units of interest for all interviews, a final review was undertaken to interpret the wording used by any interviewee in relation to the same unit of interest expressed differently by any other interviewee. Each interview provided between 18 and 50 units of interest, with an average of 34 units per interview.

5.6.2 Hermeneutic Interpretation

Hermeneutic interpretation allows a researcher to interpret the meaning of (Addeo, 2013; Butler, 1998) or gain an understanding of texts (Myers, 2013). It enables understanding things from the viewpoint of someone else and appreciating the cultural and social elements that may have influenced the outlook. It thereby allows an understanding of the interviewee's perspective to comprehend the events or experiences that have formed their viewpoint. By using this form of analysis, it is possible to understand the individual components of an interview, not just the complete interview. This is the concept of the hermeneutic cycle (see Figure 5.2), which refers to the

discourse between the interpretation of the parts leading to an understanding of the whole (Heidegger, 1962).

Figure 5.2

Hermeneutic Cycle (Based on Heidegger, 1962)

Discovery of artifact

Breakdown of situation references

Preunderstaning of the situation

Interpretation

Explicit understanding

Assertion
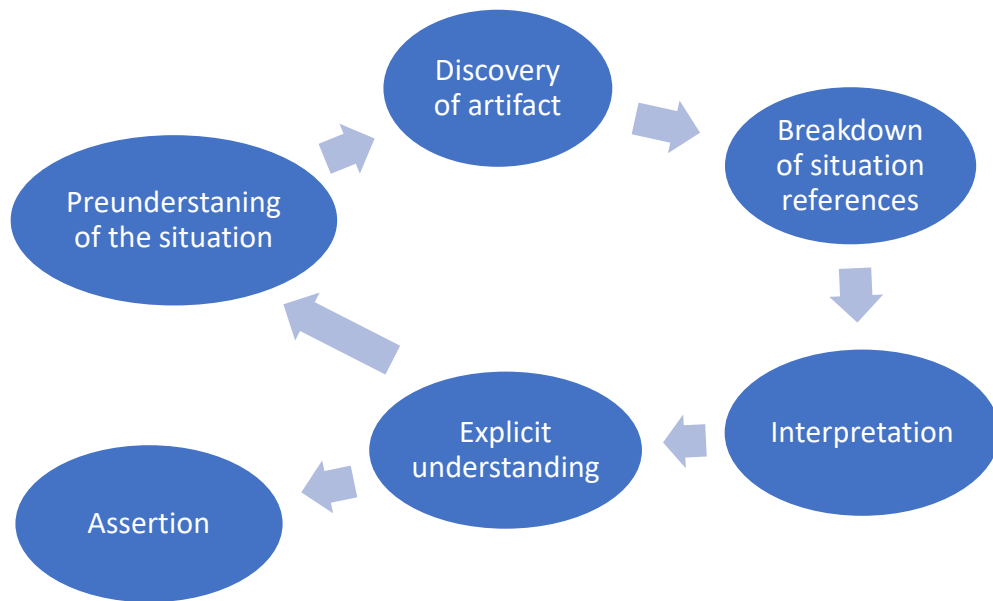
5.6.3 Classification and Grouping

Each unit of interest was interpreted in relation to the research project problem in its entirety. From there, it was possible to understand its meaning and significance and classify it according to one of the researcher's groupings. The groupings were intentionally not limited to the specific areas of this research project. The researcher considered it essential to initially include and examine all significant aspects of the referee and coaching educational environment to gain a more comprehensive understanding of the dynamics that influence each individual and the delivery of the education programs. Initially, there were 12 groupings; this was later refined to eight. Each unit of interest was assigned to one of the eight groupings (see Table 5.3), which correspond to the fundamental areas of knowledge being sought.

Table 5.3

Classification of Units of Interest

Grouping	Further clarification
Current offerings	These units related to the current delivery of educational programs relating to delivery mode and issues specific to the delivery.
Desirable for courses	These units related to aspects considered to be enhancements to both the delivery and access to course and course content.
Culture	These units related to matters surrounding the norms and social behaviour across the region(s), including customs, language, beliefs, capabilities, laws, etc.
Experience	These units related to the building and maintaining of competition experience.
Feedback	These units related to current feedback, both from the perspective of the specific education program and associated testing. In addition, it included units related to feedback focused on referees and/or coaches related to improvement of skill sets (e.g., feedback given at a competition).
Organisation	These units related to organisation matters such as nomination to attend educational programs and accreditation matters, and other matters external to but impacting on the educational program offerings.
Relationships	These units related to the building and application of relationships for competition stakeholders.
Rule and interpretation changes	These units related to issues surrounding rule changes and the applied interpretations of rules.

5.6.4 Dominant Themes

Following the completion of the classification of each unit of interest for each interview, the corresponding material was combined across the entire range of the research. The research produced over 450 units of interest, with an approximate regional

99

breakdown of 215 units from the interviews from the Oceania region and 245 units from the interviews from the other regions combined. Due to the nature of the analysed material, it was necessary to subdivide some of the classifications:

- 'Desirable for Courses' units were subdivided into 'Course Structure', 'Course Content', 'Tournament', 'Presenter', 'Communication' and 'Outcomes'.

- 'Culture' units were subdivided into 'Language', 'Different Customs/Cultures', 'Race' and 'Religion'.

The other classifications were less prone to deconstruction and, as such, remained largely within their major individual grouping.

The grouping of similar units of interest across the complete set of interviews enabled each interview to be compared against each other and provided an avenue for dominant themes to emerge. Themes emerged that featured across the majority of interviews and across regions, and with differing degrees of dominance. The dominance ranged from 'always present', 'frequent' to 'occasional but significantly important'.

5.7 Trustworthiness and Study Limitations

Trustworthiness relates to the degree of confidence in the quality of research regarding the data, interpretation of the data and methods used (Connelly, 2016; Polit & Beck, 2021). Methodologically quantitative and qualitative research differs, and there are different measures for evaluating each. Per Cope (2014, p. 89), the 'perspectives of quantitative research are rigour and validity, and the perspectives of qualitative research are credibility and trustworthiness'. Many qualitative researchers have accepted Lincoln and Guba's (1985) initial criteria for trustworthiness of credibility, dependability, confirmability and transferability (Amin et al, 2020). Guba and Lincoln (1994) later extended the criteria to include authenticity, which indicates how well the reality and

situations of the research participants are achieved and represented through the analysis (Bloomberg & Volpe, 2012; Creswell, 2009). These criteria are discussed below for this project. Elo et al. (2014, p. 8) state that trustworthiness is also dependent on the 'availability of rich, appropriate and well-saturated data'.

5.7.1 Credibility

Credibility refers to the legitimacy of the data or the validity of the interpretation and representation of participants' views and insights (Cope, 2014; Krefting, 1991; Polit & Beck, 2021). It is desirable to have credibility when the researcher becomes deeply familiar with recurring instances by taking notes and jottings of occurrences in the context of events (Lemon & Hayes, 2020; Stahl & King, 2020). In this project, this occurred through the attending of educational and pre-event educational debriefs for referees and coaches during the data collection period.

5.7.2 Dependability

Dependability refers to the consistency of data over comparable settings. Cope (2014, p. 89) states that a qualitative study is considered credible if the descriptions of the human experience are directly recognisable by other individuals who share the same experience. Lemon and Hayes (2020) argue that dependability is achieved via coherent themes reported across transcripts. Krefting (1991) identified that credibility can be achieved via a code/recode method where the researcher, after the initial coding of the data, waits at least two weeks and then returns to recode the data and compares the results. This project followed this process. Gorman and Clayton (2005) state that dependability can also be identified when the researcher has used multiple sources of data (where possible) and explained the data collection and recording process in detail. These processes for this project have been detailed in previous sections of Chapter 5.

5.7.3 Confirmability

Confirmability refers to the ability to establish that the collected data represent participants' responses and not the viewpoints of the researcher or the researcher's bias (Lemon & Hayes, 2020; Polit & Beck, 2021). Cope (2014) states this may be demonstrated through a description of how conclusions and interpretations were achieved and through the use of rich participant quotations representing emerging themes. This project followed this recommendation, as evident in the reporting of results in Chapter 6.

5.7.4 Transferability

Transferability refers to the degree to which study findings can be applied to other groups or other situations (Bloomberg & Volpe, 2012; Houghton et al., 2013; Stahl & King, 2020). Cope (2014) further states that the criteria of transferability is met if the research results have meaning to others who are not involved in the study. This project's results have direct meaning to and may be applied to other WT regions, the world body/WT and potentially other sports in the delivery of their respective educational programs.

5.7.5 Authenticity

Authenticity is the extent to which the researcher fairly and completely shows a range of realities, realistically convey the participants' lives and expresses the true emotions and feelings of participants' experiences. This can be addressed via the selection of appropriate participants and developed participant–researcher collaboration with full information sharing. This project's selection of participants; collaboration to gather data from their individual perspectives; and sharing, confirming and validating interview data (see previous sections in Chapter 5) ensure authenticity has been achieved.

5.7.6 Study Limitations

The most obvious potential limitation in this study is interpretive bias by the researcher in the analysis of interpretive data. Such possible bias was considered and addressed. Use of hermeneutic and phenomenological techniques means the analysis is an impartial and honest representation of the data collected, examined and classified. While the interpretation of the data was done entirely by the researcher, they were supported and guided in this by their academic colleagues and supervisors. While the researcher has considerable experience in the sport and in the delivery of educational programs, it is unlikely that these experiences coloured the interpretation of the data. As previously discussed (see Chapter 4), the researcher suspended their preconceptions about the subject matter and participants during the data collection and analysis.

There is always the possibility that the researcher may have constructed meaning or interpretation where others may not have, or overlooked elements that others may consider to be significant. This may leave some of this project's reflections and insights open to challenge from those construing the presented information differently.

This research is also liable to criticism that 12 interviews is an insufficient sample to gain the necessary depth of understanding to address the problem. However, as previously discussed, this has been determined in prior studies as a sufficient sample size (see Section 5.2.1). The experienced practitioners interviewed in this research have a deep and extensive range of experiences in the sport. The issue of quantity versus quality has been noted by Sanders (1982, p. 356):

> The first critical rule for the phenomenological researcher is: more subjects do not yield more information. Quantity should not be confused with quality. The phenomenologist must learn how to engage in in-depth probing of a limited number of individuals… too many subjects can become overwhelming.

As stated in this chapter, and as shown in Chapter 6, a substantial volume of data were extracted and analysed from the in-depth interviews. Further, as previously stated, theoretical/data saturation was reached by the ninth interview (see Section 5.2.1), after which no new themes or relationships were discovered. Data collection continued until analysis provided sufficient understanding of the themes, units of interest and relationships and until no new concepts emerged. Therefore, additional interviews would likely not have changed or enriched the results. In addition, the task of defining valuable themes and comparisons would have become increasingly prolonged and potentially more complex had further interviews been conducted, which would have lengthened the time frame for the project.

5.8 Chapter Summary

This chapter has discussed the recruitment of participants, interview design and refinement, and data collection and analysis. Further, issues of trustworthiness were addressed, and ethical considerations and study limitations were discussed. The next chapter presents the research findings.

Chapter 6: Research Results

6.1 Introduction

This chapter presents the project's findings based on the collected interview data. The presented findings provide the basis for the proposed framework for the education of referees and coaches in the Oceania region (see Chapter 7). The findings presented in this chapter relate specifically to the identified themes/groupings.

Table 6.1

Findings of Themes

Findings Themes	Further clarification
Current environment	The findings identified common issues and problems in coach and referee education needing considerable improvement.
Desired environment	The findings identified areas and components considered to be essential for a suitable educational environment.
Culture	The findings examined cultural issues within the sport which impact the delivery of education within the Oceania region.
Experience	The findings focused on the gaining of necessary experience for both coaches and referees in the Oceania region.
Communication	The findings focused on communication and feedback needs across the sport with respect to coaching and refereeing.
Organisation	The findings identified organisational areas impacting the delivery of education and information dissemination.
Relationships	The findings identified aspects in which relationships are developed and the impacts of those relationships.
Rule and interpretation changes	The findings identified areas surrounding rule and interpretation changes, and the impacts of those changes to the region's stakeholders.

Appendix G presents each participant's narrative, comprising a brief profile followed by a detailed description of the collected interview data.

6.2 Findings

The analysis of interview data revealed many issues and areas where the education of coaches and referees could be considerably improved. Examination of this data provides the basis for creating a more suitable learning environment for all stakeholders.

6.2.1 Current Environment and Issues

While there have been many attempts to standardise education for coaches and referees, there are ongoing problems, issues and frustrations. The interviews identified many common problems and issues. These were not specific to any country or region but rather were being experienced at most, if not all, levels of the sport.

6.2.1.1 Communication

All interviewees stated that a lack of communication exists at all levels. Often, changes to rules and especially the applications of rules are not communicated down to all levels, and there is very little dialogue with WT (the world body) and its regional and national members. It was identified that the only way in which a coach or referee is able to keep abreast of the current rules and interpretations is to attend and/or participate in international events. Several referee participants stated that by missing two or three major events, they felt they had fallen considerably behind on current rule applications. A similar sentiment was expressed by coach participants.

Changes to rules are done via a general assembly, where WT asks for feedback/comments from its executive council members. There is no consultation with referees or coaches at the regional levels. There are referee, coach and technical committees in each region, yet no information dissemination or consultation occurs

between WT and the regional-level bodies. The Oceania region/OTU does not have any representation on these committees, nor is it consulted in any way on matters related to these committees and competition rules and structures. Similarly, while not necessarily occurring with all member countries, there appears to be a similar disconnect between regions and their respective member countries.

Considerable frustration at the lack of communication and representation was expressed by several of the participants. As summarised by Participant J:

Because they being the headquarters, they will have more input and feedback than what we would ever get. We probably get 10 per cent, what they get is 80–90 per cent. That's how it should be done. And they do it at a high level and we should be at that level.

There is a lack of consultation with and involvement at the grassroots levels. Communication filters down only to certain levels and rarely to the organisational levels. Participant G referred to this as 'non-communication', citing that their country had attempted to establish two-way communication channels between their executive council members and WT committee members but that this has 'not gone anywhere'.

There should be a platform or platforms where coaches and referees can share their experiences and, ideally, discuss situations related to competition. This had previously been informally done via a group of senior international referees who shared among themselves the changes in rules, interpretations and applications following each major event. They, in turn, shared this information with referees and coaches in their country. However, WT, through the referee chair, considered this to be unofficial and ordered the practice to stop. Subsequently, coaches and referees were advised to attend seminars conducted by WT to stay up to date.

The provision of a platform for dissemination of information would provide an avenue for coaches and referees to stay up to date with the continual rule changes and, per Participant D's suggestion, could provide WT decision-makers with continual feedback on the effectiveness of a rule change and its impacts on competition. Participant I also considered it important that communication be at a level where it can be understood by most stakeholders, not just those at the elite level, which may require more detail of reasons behind a change. Participant I considered that with current technology, information should be readily available and easy to access. Currently, there are numerous sources of information available via the internet; however, these stem from the frustration of stakeholders over the lack of an 'official' forum and provide unofficial, non-standardised and sometimes conflicting information due to individuals' own interpretations. Further, the information may be out of date by the time it is promulgated via these means.

6.2.1.2 Course Content

The content of the courses delivered by WT are focused on world/international-level competition. While there have been attempts by WT to unify referee and coach education globally, this has not addressed the fact that some rules are difficult or impossible to apply in some countries and regions. This leads to 'local' interpretations being applied to suit the local environment, which can impact on referees, coaches and athletes when they officiate and compete at higher levels. Domestic athletes are competing and being selected into representative teams under rules interpreted differently at the local level versus the interpretations that will be applied by international referees at a higher level. This is not limited to different content from region to region, or country to country within a region; in some countries, there are differing interpretations between states and/or provinces.

6.2.1.3 Course Structure

The structures of the courses being offered are primarily the same worldwide. Most countries follow a similar format to that offered by WT. The general model is, in essence, a stand-and-deliver model. Only recently has WT started to incorporate the use of video clips to provide visual examples of rule applications. Prior to the introduction of video clips, the course structure was an instructor delivering the rules and interpretations of the relevant rule, working through the rule book rule by rule. The format of seminars is one or two stand-and-deliver sessions with some limited practical sessions where referees practised hand signals and basic match management (starting and finishing a match, knock down procedure, calling for a doctor, etc.).

Educational courses are focused on referees and referee accreditation. Only in recent years have coaching courses and coaching certification been introduced, mostly focused on player safety, rule applications and the like. These courses are lacking in the areas of skill development, strength and conditioning, match tactics, athlete preparation and recovery, among others.

6.2.1.4 Outcomes

The current educational program, while in theory delivering the same course materials, it is not necessarily doing so. Courses are managed and delivered by differing groups of people with differing skill sets, levels of competition experience and governing levels. For example, a state body in Australia may have a course presenter who is neither an experienced coach or international referee, yet delivers an educational program for their state's members based on that individual presenter's understandings of the rules and interpretations. Subsequently, the course participants are incorrectly educated, which, in turn, impacts athletes and competitions. Currently, there is no formal process to prevent this from occurring.

6.2.1.5 Course Presenter

Course presenters are typically at a national level, generally the local referee director. The referee director is generally an international referee. However, this is not the rule, and there are many states/provinces and countries in which education for coaches and referees is being provided by instructors who are neither qualified nor current with the rules and interpretations.

WT commenced a coach instructor program and trained instructors worldwide. The intention was to have trained instructors worldwide providing a standard education program globally and to provide a pathway for coach accreditation for coach participation at international events. However, many of these instructors are not used in delivering of education programs and are not being kept up to date with rules and interpretations by WT.

Referee education at the global level is provided by WT's referee chair and an education team. International referees are required to be current and, to this end, required to attend a refresher course every two years.

6.2.1.6 Tournament

Prior to every tournament, there is an educational/training session for the officiating referees and a debrief for coaches. These range in duration. For referees, they range from a few hours for an international open to three days for a world championship. For coaches, they are usually far shorter, ranging from 20 minutes to a few hours.

During these sessions, the rules and interpretations that will be applied for that tournament are reviewed. There are no pre-work materials or information disseminated to participants prior to the relevant meeting. At international opens, it is typically a debrief delivered by the chief referee for the event; at the world championship level, it is

along similar lines to a standard referee refresher course but with more time spent on the practical components. The delivery mode of these sessions is normally one-way delivery, with very little discussion or analysis of rules and potential match situations that may occur or have previously occurred at this level.

6.2.2 Desired Environment

It was clear that the current environment is not meeting the preferred requirements and necessities of the sport's stakeholders. This section presents the components considered essential for an educational environment to suitably address the modern-day requirements of the sport's stakeholders.

6.2.2.1 Communication

It was considered important that the communications to various stakeholders come from one source or person and are communicated regularly to all levels within the sport. Regarding the delivery of course materials and pre-competition debriefing, while in theory the same rules are applied across all competitions, this is not necessarily the case in practice. Different course presenters and those giving pre-competition debriefs, especially at the local levels, have their own understandings of the rules that may differ from the rule interpretations at the elite level.

To minimise the potential for misunderstandings and to create transparency, the delivery of materials related to rules and their interpretations should be from the same individual or source and delivered to all levels (grassroots to elite):

> *And so it is important to have the same individuals who are communicating to everyone. So they're communicating to the referees, they're communicating to coaches.* (Participant B)

6.2.2.2 Course Content

Course content and the roles of coaches and referees require additional areas be included in the current curriculum. The Oceania region is in somewhat of a dilemma as competition at the elite level or regional level requires considerable technology that is not readily available. Additionally, referees are often required to be fully competent with the relevant technology, in some cases, from the commencement of competition.

A referee is expected to be skilled in the PSS competition management system (Daedo and KP&P systems) and video review system, as well as current with the rules and regulations and their applications. The current course structures do not address the management of technologies used in competition and pre-competition training does not allow for training with the technologies. There is limited instruction on identifying the displays on the scoring display screen.

Participants identified the need to provide more practical examples of the applications of rules. Several identified that this could be easily achieved with the use of appropriate video clips, possibly with voice-overs talking through the reasons for a decision and how and why it had been applied. Participant B's response encapsulates the majority of participants' responses.

> *So let's suppose that referee chair made a video and said, 'Here's the scenario. Here's how we're going to apply the rule for holding, you know, if the hand passes the body, you are going to give Gam Jeom, and here's here are five examples. And here's what the referee is going to do about each of these five examples'. And it's not comprehensive, but it will give you an idea. Maybe we grab 20 clips from real matches.* (Participant B)

Such video clips could be structured so that they address situations in order, from easiest to most complex.

There was a general feeling that course content should additionally be structured to satisfy the needs of those at the beginner level and be sufficient for elite-level referees and coaches. It was identified that course content should also include the actual management of situations outside the physical match but related to competition, for example, how to conduct a weigh-in session from both the referee and coach perspective, the expectations of a coach, and what to do if an athlete fails their first attempt at weigh-in.

There was also a feeling that course content should include additional components such as people management, the management of situations that may occur during a competition and especially the management of critical first aid situations.

While all expressed that on-court experience could not be substituted with video clips and course materials, it was felt that a more rounded educational program would better prepare referees and coaches for international and domestic competition.

6.2.2.3 Course Structure

The structure of courses and structure of course content was discussed considerably by participants. In general, it was considered that technology needs to be applied and used in any revised course structure and the technologies used should be easily accessible:

> *I think it would be a very good idea and it would save many people a lot of money if we go for online training. Online training is being used now by most of the major large companies and face-to-face sessions is like almost obsolete.*
> (Participant E)

The course needs to be flexible and more readily accessible, not only to coaches and referees but to all stakeholders and interested parties. The two main factors relating to the structure are cost and time. The structure must be such that it is more easily

accessible and accessible at an affordable cost. Many participants cannot afford the time away from family, home and work and self-funding of costs to maintain or attain accreditation or currency with the ever-changing rules, regulations and their interpretations and applications.

In addition, it was felt that all countries and regions should be teaching the same content and not content that has been locally interpreted. While it is understood that each country may have specific requirements (e.g., specific domestic accreditation requirements with the country's national sporting commission), the actual rules, interpretations and applications should be the same globally and taught as such in a manner 'that is easy to understand, easy to deliver and also structured around the current international level' (Participant J). Another common thread was that a new structure should cater for the differing skill sets required and the differing level of competencies.

6.2.2.4 Outcomes

The main outcomes of the educational program for both coaches and referees are to be current with the latest rules and provide avenues for participants to improve their skills. Additional benefits are opportunities to extend one's network in the sport, which provide opportunities for invitations to international competitions and, thus, further development of on-court skills.

An educational program should also provide an avenue for participants to share experiences among their peers to gain insights into real-life situations and surrounding circumstances that may influence a decision being made by a coach or a referee:

> *So I think education of referees is rather important for all the international referees to update your skills, to get the latest information and also be able to share experiences among all the referees and that can improve the sport of Taekwondo.* (Participant H)

An educational program must be designed such that it provides avenues for junior referees and coaches to update on the rules but also develop and improve. The program should be structured such that all participants are not only updated but are more knowledgeable upon completing the course or seminar.

6.2.2.5 Course Presenter

It was considered imperative that the presenters of all educational programs have the soft skills to be able to engage the audience, get the message across and provide a platform for discussion among course participants. These skills are not necessarily aligned with Taekwondo belt ranks, as noted by Participant F and echoed by others:

> *Okay, one fault I find with any of the martial arts and educational seminars and systems is that we put too much emphasis upon a rank of the person and not on the ability to communicate with people. Some of the best teachers and instructors do not necessarily hold the highest ranks but we are fixated with the martial world with the rank system, so our best educators might not necessarily be instructing the course but taking the course. We need to choose the best people for the job, not the highest rank.* (Participant F)

Interestingly, it was noted that the course presenter needs to be very knowledgeable about the subject matter (whether it be the rules, regulations and interpretations) *and* have a certain passion and desire to teach:

> *Well that is your presenter, right? The person who presents can make math interesting, right? A good presenter. So the presenter has to love what they're doing. They have to love the sport. They have to love the rules. They have to love doing the talking and the teaching. If you don't want those things, you shouldn't be the presenter. I don't care what else you may well know more. You may know*

more than anybody else, you may be the best referee but if you don't love

teaching it's not gonna come across. (Participant I)

As previously noted, while this depth of knowledge and understanding does come with extensive experience, the ideal course presenters are not necessarily the most experienced referees or coaches.

With the exception of Participant H, all participants considered that the number of course presenters should be limited to a manageable pool to facilitate the dissemination of updated course content and ensure the same content is being delivered. This is in contrast to current practices, where countries and even states and provinces have multiple presenters delivering educational programs that may not be current or contain incorrect and locally interpreted content. Participant J considered that educational programs should be delivered and managed from the regional level and that individual countries seek the delivery of coach and referee education from their respective regional body, which should additionally manage the accreditation of referees and coaches at national and regional levels. Participant H did indicate that the educational programs should be delivered only by the relevant country's most senior and experienced referees and coaches.

It was also expressed that the pool of presenters should come from a limited set of people, and that these people be highly skilled in refereeing and/or coaching, have the necessary soft skills to deliver engaging educational programs, but be limited in number to manage the delivery of programs and prevent variation in content. While a presenter should be able to provide the course content, the content should be supported with actual examples and experiences of situations surrounding the applications of rules and interpretations.

The presenter must be able to deliver a program and program content designed for active learning and not simply a one-way delivery. The presenter must have the skill sets to engage participants in the learning through discussions, encourage thinking and proposing of solutions to complex situations that may occur during competition, pre-competition and post-competition.

Several participants agreed that there needs to be consistency in the interpretation and application of a rule, the rule interpretation needs to come from one source and the rule should be adopted and applied the same way at all levels. While this appears to be common sense, the current reality is different. WT's leadership should be the one source; however, the continual rule changes are made without any consultation with or input from the regional levels and are not disseminated to regions and MNAs. Subsequently, there is always the potential for athletes needing to train and compete under variations of rule interpretations:

> *Yeah, I mean, I think you could have done more local or regional level. But again, you come back to the way it's done in the United States might be different than the way it's done in China. So the further up the chain the source materials can come from, the better, you know. It's coming directly from the WT referee chair, that's probably the ideal thing, or the committee or whatnot, so that everybody is seeing the same thing.* (Participant B)

Consistency is imperative and needs to be at all levels and across all matches being played in a tournament or competition, which can be achieved through suitable leadership and a leadership team:

> *And so, you know, that's where the leadership piece of it comes in, because you've got to have somebody who's saying, 'This is how it's going to be. This is what the interpretation is, and it's not always the best possible answer, it's the*

only answer, but it's the one that we're going to do'. So we're on the same page.

So that's where the education piece means you got to say, you got to find out

what is the interpretation that we're all going with so that we do it consistently;

because if I am the athlete, of course I want to have the same experience in court

number 1 as I do in court number 10, and that's only possible if the referees are

on the same page. (Participant B)

This leadership, as suggested by Participant I, needs to have the recognition and trust of course participants, which is gained via deep understanding of all aspects of competition, not just the rules, and suitable self-confidence.

6.2.2.6 Tournament

There were considerable thoughts expressed on the pre-event training needing to be more efficient and effective. With major events such as world championships being conducted over seven days, the additional two or three pre-event training days should be revisited as there is a lot of duplication, downtime and missed opportunities.

Through the use of technologies, suitably designed pre-event training modules could be developed to run online prior to the attending of an event. This would provide time for the referees at a major event to have more specific pre-event training, rather than simply reviewing the rules and interpretations. These modules could also be made available to other stakeholders participating in a competition, thus providing them with extra time to be better prepared for competition, rather than attending debriefing meetings:

And so everybody who shows up at the, you know, at the game has already taken

this course online, coaches included perhaps, so that we're all covering the

same materials, and everybody's got a baseline. (Participant I)

Participant K additionally suggested that having pre-event online modules could provide greater opportunities for referees, and possibly coaches, to test themselves and review areas where they consider they fall short prior to a competition. As such, they will arrive at a competition better prepared and able to focus more on the competition at hand rather than attempting to make up shortfalls immediately prior to or even during a competition:

> *Benefits for the individual person is you know what your weaknesses are, you know what your strengths are. So you would be ready for any learning opportunity when you did turn up to the seminar or when you did turn up at the event. You would know where your holes are, where you're learning, and so you can fill those holes when you get there, as opposed to just learning the stuff over and over that you already knew, filling in the gaps.* (Participant K)

Mechanisms could also be put in place to ensure that the required participants at a competition—referees, coaches and possibly even the athletes—have reviewed the pre-event materials. Such mechanisms could be, for example, online tests where completion is a prerequisite to participate at the event.

6.2.3 Culture

The are many dimensions and forms of culture (Cohen, 2009; Triandis, 2004). For example, Cohen (2009) stated that defining culture is not a simple task, noting that Kroeber and Kluckhohn (1952) collected 164 different definitions of culture. Hofstede (2011) defined five, later six, dimensions of culture. His work provides a platform for a better understanding of culture and the impact of culture on the development of solutions related to problems involving culture or where culture has an impact.

Sport Taekwondo attracts stakeholders from across the world and from every continent. There are participants at every event—competitions, seminars and courses—from many cultures and across Hofstede's dimensions of culture.

While this project does not examine cultural issues within the sport, it is necessary to examine cultural issues that may impact the delivery of education for Taekwondo referees and coaches within the Oceania region. As such, this work examines those of Hofstede's cultural dimensions considered relevant to this project.

6.2.3.1 Customs

Participant C summed up the issues at a global level with respect to referees and coaches simply with, 'The other problem is international referees come from all over the world from different cultures'. While Participant C was identifying that cultural issues are global in the sport, the various cultural issues could arguably be no more diverse and greater than within the Oceania region, where most member countries are multicultural. Samoa, for example, has standard cultural issues across the country and cultural issues with indigenous groups such as the Niueans and Tokelauans. Samoa, as well as other Polynesian countries, also maintains strong cultural traditions and elements of fa'a Samoa.

6.2.3.2 Educational Motivation

As would be expected from such a diverse region, the sport attracts participants with varying educational standards, ranging from very little formal education to tertiary qualified. Participants indicated that an educational model needs to cater for the differing educational backgrounds of the sport's stakeholders. In addition, the educational model must be attractive to participants and is an educational tool where people are encouraged to participate and learn:

I think, on a kind of personal level, an imperative component is people's attitudes and willingness to learn. (Participant L)

Developing an educational model for such a broad range of educational standards requires the program to be sufficient, motivate people to return, be easily accessible and be the single source of correct information:

It needs to be self-motivating. At the moment, you need to ensure you are checking for updates and making sure your interpretations are as they stand at the moment and are correct. (Participant K)

Participants at courses are not required to meet any set minimal educational level. However, depending on the course, they are required to have attained a certain minimal Taekwondo level or grade (see Section 3.5.2). In addition, there are attendees who are required to attend for varying reasons, such as reaccreditation requirements or having been directed by a senior instructor to attend. Often, these course participants lack motivation to actively participate and/or have extensive experience and will not gain any real benefit from attending:

There's also, I think people's kind of attitudes and willingness to learn can be an inhibitor because some people attend these courses because they're told to. They're told they have to refresh every so often, but they feel like they have nothing more to learn and that they know everything and so that's definitely an inhibitor to their learning. (Participant L)

Some of the attendees in this category will, in all likelihood, have as good as or an even better understanding of the rules and regulations that the course presenter.

6.2.3.3 Language

Originally, sport Taekwondo had several official languages—predominantly Korean and English, but also Spanish, French and Russian. While the origins of the

sport date back more than 2,000 years in Korea, and even though all commands during a match are in Korean, English has been adopted as the official language of the sport and instruction at seminars is delivered in English. Although the official book of rules and interpretations is published in both Korean and English, those participants conversant with both languages stated that there are some subtle differences between the rules in the two publications due to the inability to directly translate some aspects of the languages.

While the official language of sport Taekwondo is English, educators from WT and in WT regions are not necessarily native English speakers. This leads to the delivery of education, including the preparation of examinations, being carried out by non-native English speakers and differing understandings of the course content being delivered:

> *For us with this being an international sport, one of the biggest inhibitors is language. We are fortunate in Australia because English is our first language, which makes us fortunate and unfortunate, I would suggest because the test papers are designed by people whose English is not their first language. So, our understanding of a question is sometimes somewhat different to what the intended meaning of the question is. But just in general, when there's discussion points, language can definitely be a barrier.* (Participant L)

Depending on the location of a seminar and the majority of the attendees, instruction may be delivered in a local language. For example, if a seminar is in Korea, additional or complimentary instruction may be given in Korean. This does not guarantee that the correct messages are being passed across, as indicated by Participant C, meaning great care needs to be used in the delivery of course content and explanations:

I can speak slow English, I can choose my words very carefully. But if the other person really doesn't know English, they will have a very hard time understanding what I'm saying. So the message that I'm trying to speak to them could be taken differently, and then your consistency is lost. Because the understanding is not the same. (Participant C)

Referees are expected to be sufficiently conversant with English, as are coaches, such that, with the exception of the Korean commands during a match, all match communication (e.g., a video review request) is to be in English. This places a burden on referees whose native tongue is not English and/or who do not live or work in environments where English is spoken. Limited English language development can hinder their comprehension of new subject matter during seminars:

Somehow, you need to communicate in the same language with the understanding that even in the rulebook between Korean and English the interpretation is not always the same. To be able to make it more consistent, you have to be able to communicate in the same language. (Participant C)

WT, as part of the Referee Education Program, developed and now provides an English language guide for referees. This is in a self-taught workbook form, where a referee learns in English a series of phrases and sentences that would be used in the management of a match. It is expected that all international referees have a sufficient grasp of the English language, and they are tested on their command of English via an oral examination. There is no educational assistance or instruction on the English language. It is expected by both WT and regional bodies that the individual referee or coach will learn the language, or at least a sufficient amount of the language, by their own means. Referees are tested on their command of English, which is usually in the

form of a brief discussion, following which the referee is given a grade and no other feedback in relation to their competency.

6.2.3.4 Social Class and Race

There exists a myriad of classes and social structures within the sport. While this is outside the scope of this project, it is an important consideration in the development of a suitable educational model. Participant C noted there are class structures within the sport itself that have developed over many years and these 'Taekwondo-specific' structures need to be taken into consideration to enable suitable support of a program:

> *My personal opinion is some people, because Taekwondo is Taekwondo, and you have people that been in it many, many years and have a status of master or grand master or you have some people who feel that this level needs extra respect, extra time spent on showing them that they're important. I guess I don't know what we're looking for.* (Participant C)

While it is an important factor to have a structure that supports the sport's senior personnel, the program should be such that it does not sacrifice educational goals to cater for a senior member:

> *I find that some of the practices are a joke. Because people don't take him seriously. I find that sometimes because of their status, too much time is spent on showing this respect rather than actual learning experience. And I go out there with my heart trying my best.* (Participant C)

Time during a seminar is usually very limited, and as Participant C indicated, time can be misused and lost due to overly catering to senior members. While appropriate respect needs to be shown, it should not be to the detriment of the course or course participants. Participant D also supported this position, stating that in some cases it may become necessary to 'play politics' to ensure that a course runs and runs as

efficiently as possible. Participant I gave an alternative approach, stating that there

should be some level of respect, but not at the expense of the course or course time:

> *How do I put this, park their egos at the door, they're not there to … they're not*
>
> *a glory hound. They don't need to be patted on the back because they already*
>
> *achieved what they need to.* (Participant I)

6.2.3.5 Religion

Drawing participants from such a large pool of countries means the sport has

participants from various religious backgrounds. The effects of this can be observed in

Oceania. Arguably, the pinnacle regional sporting event in the Oceania region is the

Pacific Games. This is a multisport event contested over two weeks, with athletes from

24 countries from the Oceania region participating (Solo, 2023). There are 17

mandatory core sports that must be contested out of a pool of 37 sports approved by the

Pacific Games Council. Each edition of the Pacific Games has a maximum of 24 sports

being contested.

A considerable number of participating Pacific island countries have strong

religious ties, especially in respecting the Christian Sabbath, where working or

participating in sporting activities is frowned upon (and, depending on the country, may

even be illegal, as in Tonga). As such, no events are scheduled to be contested on the

Sundays during the Pacific Games. Further, events themselves are impacted by religious

sensitivities; for example, the attire in beach volleyball and soccer has been modified for

women. Taekwondo has had to make concessions to allow athletes to wear religious

attire, usually with accompanying statements to this effect in the rules.

Currently, the Oceania region does not have many, if any, international referees

from the countries with strong Christian Sabbath observance. The expansion of the sport

and the Pacific Games Council's desire for referees to be drawn primarily from the

Oceania region will affect the provision of educational programs, as currently a high percentage of the sport's education is conducted over periods that include Sundays.

6.2.3.6 Distance and Costs

This single dimension has a massive impact on the sport. Required travel to attend face-to-face seminars, events and competitions make it prohibitive for many of the region's stakeholders, especially those at the grassroots levels, to actively participate in training. The distances from one member country to another may, in some cases, mean days of travel and unaffordable costs. The OTU, in an attempt to increase the presence of international referees in the region, fully funded several participants to attend an international WT referee accreditation seminar in Thailand. This still necessitated the participants to travel considerable distances and make time to attend. The OTU has additionally provided some educational programs in some member countries by sending educators to several countries; however, due to the distances involved, participants at these seminars were only from within the respective country.

This is reflected in the distribution of international referees and active elite-level coaches within the Oceania region. The countries with the greatest number of international referees and elite coaches are, in order, Australia, New Zealand, French Polynesia and New Caledonia. The latter two have only a few elite coaches and French Polynesia does not have any international referees.

6.2.4 Experience

The gaining of experience was identified broadly under three categories: at competitions, through the Olympic Games selection process, and generally in training and on court. It was considered that the educational programs in these three categories played a very important role and were considered a major factor in the development of coaches and referees. Education programs that fall under the general competition and

training and on court categories are open to any participants who meet the minimum
participation requirements and/or are appointed to a specific event. However,
participation at the education programs for the Olympic Games is via invitation only
and usually requires partaking in selection processes. Participation is not open to all,
and participants are drawn from selected groups of coaches and referees. The Olympic
educational programs are specifically focused on that one competition while providing
valuable educational resources for selected individuals to take back to their countries:

> *I mean, most international referees have a lot of experience as a referee, you*
> *take part in many international tournaments. But the Olympic selection camp is*
> *special and not many get to go there. So, if you get an invitation, it's kind of an*
> *eye-opening experience of how the camps are conducted. And also if you want to*
> *teach Taekwondo or teach refereeing, it's something you can pass on to your*
> *students.* (Participant E)

All participants commented that to gain real, valuable and effective experience,
referees and coaches need to officiate at events. There have been many situations where
referees who have just attained their international referee certification have been
appointed by WT to a major event as their first international experience and struggled or
been well out of their depth due to lack of on-court experience.

6.2.4.1 Competition

Prior to all major WT competitions, depending on the event, WT runs a two- or
three-day referee training seminar on the days immediately prior to the event. This is
mandatory for all appointed referees to attend. Typically, at these seminars, the
international referees will refresh over the rules and any changes in interpretations,
either recent or to be applied in that particular competition. Additionally, referees will
practise hand signals, the processes surrounding the management of a match and

practise with simulated matches. The referees will also practise scoring using the PSS hand controls and, if time permits, some video review if the equipment is set up in time.

Typically, for a world championship, approximately 100 international referees will be appointed for the seven-day event, and a smaller number of referees are appointed for other major WT events. At these events, there is a heads of teams meeting, which is attended by the head of the respective national team and some of the coaches. At this meeting, the rule interpretations to be applied at that competition are detailed to the attendees. This information is not distributed prior to the event or the meeting. For new international referees, they found this to be a valuable experience—in some circumstances, their first experience—with some of the competition equipment:

It was the first world championships that I ever was asked to participate in and there were many new experiences, especially with the kids wearing different helmets. (Participant C)

Some participants indicated that some referees found this experience somewhat daunting but did find the training and competition very beneficial. International referees at the elite level are under the microscope, with every match of the competition being closely monitored and reviewed by WT's Competition Supervisory Board (CSB). It is not uncommon for one or two international referees to be sanctioned following or during one of these major events due to incorrect decisions. There is pressure on the referees to adjudicate error free in all matches they are appointed to over the entire period of the event; in the case of world championships, this is seven days, with the days often running into 10 or 12-hour days. Participant A noted when referring to officiating at WT's world-level events, 'There was a pressure to do the very best possible so there will be no question as to the officiating and the propriety of that'.

One of the benefits of attending the training seminars in person was that this enabled the referees and coaches to interact and collaborate with their colleagues and peers:

I think, because I found that the best educative experience, really, the participants at the course were very encouraging of each other but also asked a real diversity of questions. So that allowed for greater discussion and then greater learning overall from everyone that was at the course. (Participant L)

Where the content of the seminars was lacking in depth, those attending the seminars found the seminars offered opportunities to gain deeper understandings and resolve understandings of the competition issues, problems and nuances through deeper peer-level discussions. These discussions often occurred with the more experienced referees from outside their country, with whom they would not normally have contact. Thus, these seminars also serve as platforms to gain a far deeper understanding of the application of a rule and an understanding of issues surrounding its application.

6.2.4.2 Olympic Games

The educational programs for the Olympic Games have generally been run over a period of approximately 12 to 18 months or more. Participants are selected to attend training camps and attend specific educational programs. For international referees, these camps were additionally designed to not only educate but also be a selection platforms. The participants who had attended these camps found them to be considerably different to any of the other educational programs they had attended.

The participants found there to be considerable pressure to excel individually and the content of the training camps to be very focused specifically towards the Olympic competition. Participant A noted the selection process he was nominated for, saw the initially selected group of 20 international referees reduced to four, and then

finally, as the education, training and selection process increased, saw him being the only representative from his country to be invited into the final training squad for the Olympic Games. From this squad, a final group was selected and required to attend a final training camp, at which the educational program was designed to provide in-depth understanding of the rule interpretations to be used at the Olympic Games and minimise the potential for any errors:

> *It was the debut of Taekwondo as a full [medal] Olympic sport and the process for selection was very rigid. Often [it is] said [it was] more difficult to become an Olympic referee than to be an athlete at the 2000 Sydney Olympic Games because there were only 24 referees that were selected through a process that took place over more than a year. So the experience was daunting in several ways.* (Participant A)

The education for the Olympic Games was designed to ensure that those referees selected for the Olympics were more effective for the specific roles they were selected for. At the early Olympic Games, referees were selected primarily on the basis of specific roles they would undertake. For example, certain referees were selected with a focus on them being used as centre referees, others as judges and, with the introduction of video review, a small group of international referees were selected specifically as video jurors. The educational programs were focused more specifically on these roles. Following the 2012 London Olympic Games, the direction of the necessary skill sets was extended such that the expected specialisation of an international referee would span across all officiating roles, such that a referee would be able to cover all roles required in a competition match rather than having individualised roles.

As the final Olympic selections for international referees progressed, it often became reasonably clear to some if they were going to be selected or not. In some cases,

those who considered that they would not be selected for the Olympics, but had still

been invited to the Olympic camps, continued to attend the camps, usually at their own

expense, to gain a deeper insight into the process and further their education. They

would then pass on the information gained through this education to their peers:

> *And the Olympic camp in Moscow, a new training experience, even though it*
> *was clear that the selections were already somehow made, I still went to the*
> *camps to gain more insight and experience about how such selection camps are*
> *being conducted. Also, if you want to teach Taekwondo or teach refereeing, it's*
> *something you can pass on to your students.* (Participant E)

The value of attending the camps is that there is more content focused on the

elite level of refereeing, whereas standard WT seminar offerings are structured to cater

more to the general international referee and coach levels and, as such, are not as in

depth.

6.2.4.3 Training

Unlike other sports, neither WT nor the OTU provide training programs for

referees outside of the face-to-face training seminars. In addition to the testing on rules

and regulations, scoring and match management, there is physical testing on

international referees as part of the assessment process at the conclusion of seminars. In

the suite of physical tests an international referee is required to undergo, there is very

little specificity and much does not relate to the actions an international referee would

be required to do in a match. In some cases, the first and only time the referee has had

an opportunity to do the physical tests is when the participant is at a training seminar. If

there is notice of the physical tests, it is with a very short lead time and insufficient for

the referee to adequately prepare physically.

There is very little opportunity for referees, especially in the Oceania region, to practise their ring craft outside of officiating at an event. As events are not common in the Oceania region, ringcraft training is difficult and puts the Oceania referees at a serious disadvantage; especially when considering that other regions have international events at least on a monthly basis (e.g., the European region had 43 international events in 2022; ETU, n.d.). Participant A stated that in his country, in the Pan American region, they are addressing this problem by running specific training camps where all stakeholders may attend to learn and practise. At these camps, mock matches are additionally played, where immediate feedback during a match is given to both referees and coaches when decisions are made and other relevant match situations occur.

Some have taken the initiative of addressing this shortfall in their clubs and use their club members to referee, focusing on sparring sessions during regular classes. This does have the benefit of providing match practice for both the club's athletes and referees but does not necessarily provide an avenue for feedback for a referee to address shortfalls in their skill sets:

> *You should be training at the club level to gain baseline experience because it's a personal thing. In my club, my referees will referee our Thursday night matches.* (Participant F)

Some of the states and provinces have state/regional training. In some situations, referees are invited to attend, but when this does occur, the intention is usually to use the referees to referee practice matches. There is no provision for these sessions to double up as training sessions for the referees and coaches:

> *They should be putting their hand up and going to events and judging or refereeing or whatever, and should be getting experience behind the desk or on the mat.* (Participant G)

The referees who do attend these sessions, when invited, do so purely on a voluntary basis without any financial or educational reward. At these sessions, there is no mentoring of the referees or coaches.

6.2.5 Communication and Feedback

The participants made several strong comments on the need for feedback, both formative and summative, and for communication and transparency. It was considered that this area alone is cause for considerable angst among the sport's stakeholders, but especially referees and coaches.

It was noted that communication in general is one way and there is very little opportunity to provide input from the grassroots level, nor is such input sought. This is also reflected in WT, where the OTU has little or no representation on WT's decision-making committees. Additionally, the respective committee chairs do not have any input, nor is any input sought, either directly or indirectly.

6.2.5.1 Communication in General

Communication across the sport was considered by the majority of participants to be incredibly poor and creating considerable issues. The existing communication channels do not seem to be related to the subject matter and communication flows are somewhat haphazard. Communication regarding coaching and refereeing matters is not forthcoming and information is not being passed down from WT to the relevant regional bodies to the member countries. There is an implicit expectation by WT that coaches and referees should attain information related to competition rules, interpretations, etc. by attending a WT-run seminar or a championship event sanctioned by WT (see Appendix C). There is no avenue for the regional bodies, even though their respective committee chairs, to have direct access to relevant information, nor does WT seek to provide this.

6.2.5.2 Competition

The participants noted that at the competition level, there was considerable room and scope for better communication. Coaches indicated that there is a need for clarity in referee decision-making during a match. The structures of competition are such that an athlete may, in all likelihood, be officiated by a different referee team for each match.

Referees are directed and instructed via pre-competition training sessions on how interpretations are to be applied. In some cases, these interpretations are tweaked each day of the competition and referees are provided with new guidelines, which may not be passed on to the coaches. This, along with the lack of an avenue to query a referee's decision, except for the use of a formal video challenge during a match, leads to frustration among coaches.

Those participants who are international referees stated that there is little or no feedback during a competition. They felt that at a competition, even at a world championship level, there is scope for feedback to allow self-improvement, especially in situations where new interpretations have been introduced. This was highlighted by the following comment from Participant A with respect to feedback being given to referees at his national and state-level competitions:

> *And hopefully you would get feedback at that level to help you improve every time show up, from either the state referee chair or someone on the referee committee.*

Some domestic referee chairs provide feedback immediately after a match to a referee to assist in their self-improvement. This form of immediate feedback was also considered by other participants to additionally be of benefit in minimising the inconsistencies in referee decision-making at any single event. Participant C stated that any feedback given needs to be clear:

I mean, it's a clarity of communication, right? So if I'm the referee chair, I've got to be ... can't be waffling about by we can do it this way today or this way tomorrow. It's got to be very clear. We also have to not say, 'We've always done it this way. And so we must continue to do it this way'. (Participant C)

Feedback and communication at events or immediately following an event to referees was considered to be a key element missing in the process of referee education. The feedback should ideally cover all aspects of a referee's performance, covering decision-making and physical aspects, including match management.

In addition, it was considered beneficial for there to be an avenue for coaches to receive feedback on their performance and decisions they may have made during a match that may or may not have affected the outcome of a match (e.g., the correct use of a video challenge).

6.2.5.3 Courses/Seminars

There was considerable discussion from all participants in relation to the lack of feedback at all levels—national, regional and international. There are limited opportunities to gain feedback, and on the occasion that feedback is given, it is after the fact. While there are some limited opportunities during courses and seminars for questions and answers, there is no individual feedback with respect to both an individual's understandings of rules and their applications and the practical side of officiating. Upon completing a seminar, depending on the nature of the seminar, there is an examination and possible series of physical tests. Participants do not get any individual feedback. Prior to current practices, participants were only informed if they had passed or failed (in some instances, this was well after the seminar). Currently, participants are advised of a score or percentage for the written test when done online and receive no feedback in relation to the practical component. There often is the offer

for feedback, but this is rarely taken up as the feedback provided is either very minimal or difficult to receive.

The general consensus was that even with the minimal feedback currently being given, it is not constructive; it is basically indicating where a participant erred without providing positive, constructive feedback. Participant I additionally noted that feedback must be structured such that it is constructive but also structured in a way in which the participant can accept it and make changes based on it. The sport has a history where, in the instances of any feedback, it has not been constructive. Further, as the sport has participants from many cultures, this needs to be considered when forming feedback:

> *So, as long as it is provided in a way that the person can accept it, because if you provide it in a way that that person can't accept, it's lost. They will defend against it. Even if I am giving you constructive feedback and I am saying it in not just as good a way as I personally can. Maybe you can take it from me and maybe somebody else has to tell you it and it has to be somebody you trust.*
> (Participant I)

The participants considered this to be a major failing in the structure of the educational programs at all levels, with only a few exceptions. In the Oceania region, feedback is provided for examinations but is general in nature (i.e., correct or incorrect answer). Participant J still considered this to be at least of some benefit, as it does provide some feedback and an avenue for a better understanding of the assessed course materials: 'But if they walk away, understanding the question and scenarios that we put to them, that is instant feedback and knowledge'.

While the region's educators are often willing to provide feedback to participants in the region's educational programs, they are limited by resources (as they provide instruction in the programs on a voluntary basis) and are hampered due to

distances and time. The region's educators are from Australia and required to travel to the host countries. They do provide some limited follow-up feedback when requested, mostly via email.

It was considered that for feedback to be effective, it needs to be immediate; this is especially important with the practical components of officiating, as noted by Participant K:

> *The benefit is knowing whether what you're doing is correct. It's a waste of time continuing your actions if it's wrong, you are just reinforcing incorrect action. So if it's incorrect, you have the opportunity to learn from it and not form bad habits of what you thought was correct.*

With the nature of the matches in the sport, this is applicable to both coaches and referees. Coaches play an active role in the decision-making process in matches as they have the opportunity to make a video review request. Such a request has processes and procedures that a coach must follow for a request to be accepted.

A dominant theme regarding the timing of feedback was that the sooner it was provided to a course participant, the more effective it would be. This was effectively summarised by Participant I: 'Immediate. You have to tell me immediately. If you tell me a week later, it's lost. It needs to be immediate, it needs to be concise'. Due to lack of feedback, coaches and referees often seek feedback through colleagues, which, while providing one avenue for feedback, may mean incorrect feedback is given.

6.2.5.4 Course-Related Matters

The sport draws participants from varying backgrounds, social and educational structures, customs and more. However, there is little avenue within the region to have any input into the development of the educational programs developed by WT. The OTU has developed its own educational program to address the region's initial

requirements; however, it is apparent that this needs to be redeveloped to address the current needs of the region. Most participants reported that there is little opportunity for input into matters related to courses and felt that this needs to be addressed. There need to be avenues for input and feedback from participants in relation to the needs of participants and the needs of their respective country and/or region.

There need to be clear, asynchronous communication avenues within the region. There need to be avenues for bottom-up communication, as identified by Participant D:

I think the top down should say, 'We are here'. You need the support and it doesn't have to be an MNA but towards the whole community within the continental union. I am the director of referees if you have questions around rule interpretation then here are some country contacts. If you don't have one in your country, then contact me via your MNA essentially, or contact me directly. And obviously then you are going to MNA to maybe answer the question, you may have to clarify, or maybe it is the case of, 'Excuse me MNA, maybe we should conduct seminars'. Maybe he is not the only coach that is asking the question, maybe there are dozens who are asking the same or similar questions.

The communication for the provision of education needs to be easy and accessible for all stakeholders. While having a regional referee or coaching director available 24/7 is not tenable, there does need to be an avenue whereby all stakeholders have easy access to correct information. This access needs to be available for all those down to the individual level, not just to a national body level.

This information should cover all aspects of refereeing and coaching, not just the competition rules, regulations and their interpretations. This includes information about upcoming events, application and entry processes, etc.

6.2.6 Organisation

The success of any project of this nature depends on the organisational and supporting structures around the project. Interview data indicated that there are barriers to the adoption of certain educational programs at differing levels within the OTU, such that there are different offerings being provided and recognised among the member countries. Some countries have elected not to use the regional offering and provide their own developed educational programs, such as Australia. Others have adopted the educational programs offered by the OTU. New Caledonia delivers the educational program for referees developed and used by the governing body for Taekwondo in France.

6.2.6.1 Regional Unions

While there are communications and dealings between the five regional unions, they are essentially working independently of each other with respect to their coach and referee education. WT sought details from each union regarding their educational programs, but it appears very little was done with this information. WT's survey did highlight that there are considerable differences in educational programs between regions. It also highlighted that there were member countries within regions who were delivering their own variations of coach and referee educational programs.

At the time of this project commencing, each region was responsible for the accreditation of coaches and the provision of coaching licences to officiate at events sanctioned by WT. Subsequently, WT re-examined the program delivery at the regional level, with the intention of having one model delivered. However, this did not eventuate, and it is anticipated that the education and accreditation programs will continue to be driven by the regions.

The delivery of education and the registration of coaches are a source of income for the regional bodies; in the OTU's case, a major source of income. Regions will likely support any endeavour that supports them in retaining these revenue streams; conversely, they will likely oppose any attempt to curtail these revenue streams.

6.2.6.2 Communication Hierarchy

There needs to be a clear and accessible method for referees and coaches to access necessary and relevant information—on the rules and regulations and on matters related to coaches and referees, including accreditation, registration, competition matters and more. This should be available across the region 24/7 and not funnelled into one person, given that the information is usually required immediately:

Generally straight from WT. There could be the opportunity to go to your country for referee chairman, or you regional/continental chairman if they are accessible, but there should be a sort of a chain of command on that. You certainly wouldn't expect a coach to go directly to a continental chairman to get elaboration on the rules. (Participant K)

Currently, coaches and referees, when requiring information, either use their own personal network or attempt to find the information via the internet. This may lead to incorrect information being disseminated:

Having a relationship with the regional continental union referee representative is important I think. So you're going up the chain essentially and beyond that it's a little bit harder. Particularly if you are the club coach I mean, the only people you really engage with is head of referees within your country, right? But having knowledge or the ability to be able to contact one step up, not bypass, but one step up is sort of essential particularly in high performance coaching.

(Participant D)

WT does send information and notices to MNAs, but not necessarily to the relevant or appropriate person. This would typically go to a MNA's president or secretary general, possibly on the assumption it will then be passed on. This does not always occur:

> *I think filtering down the information or more readily. I think there's pretty good communication within our country. But I know that it can be, you know, if one person doesn't forward it on or share it, then you're stymied your blocked. So that can be an issue with filtering the information down.* (Participant I)

An established communication hierarchy for all aspects of the education and accreditation process would provide a more effective mechanism than that is currently in place.

6.2.6.3 Olympics Organisationally

The Olympic selection process is demanding on international referees due to the numerous training camps and events that aspiring Olympic referees are required to attend. At the training camps, and at Olympic events, referees are assessed and their number gradually reduced until there is a final pool of referees to officiate at the Olympic Games. The Oceania international referee pool is limited due to the number of international referees in the member countries and the number of Olympic Games spots for Oceania representatives—normally only one or two.

There is no consultation or input from the OTU to WT regarding either referee nomination or matters that may affect the availability of a potential referee. For example, for the 2020 Olympic Games, one of the mandatory selection training camps was scheduled over the Easter weekend. The OTU raised this with WT as a problem for many within the region; WT did not act on this, resulting in a considerable number of suitable referees not being available due to religious or family commitments. In

addition, international referees must attend specific camps, which are usually well outside of the region and incur considerable expense to the referee.

Coaches are nominated/selected from within the member countries. There is an Olympic qualification event conducted in the Oceania region through which countries can qualify to send an athlete(s) to the Olympic Games. This is in addition to the athletes, through other WT-sanctioned events, building ranking points, which provide entry to the Olympics. There are only 128 spots for the Olympic Taekwondo competition. The number of spots, known as 'tickets' or 'quotas', is predetermined, with Oceania usually having eight spots. A country that qualifies will nominate a coach, who may or may not be from that country. For example, when Papua New Guinea qualified in the sport for the 2012 Olympics, the coach was recruited from outside the country.

6.2.6.4 Organisational Feedback/Communication

While there was demand expressed for constructive feedback for the participants of coach and referee courses, Participants H and J additionally felt there need to be avenues for feedback on the needs and requirements of educational programs from grassroots participants to the relevant course designer. The current practice is that a course is designed and/or modified without input from the Oceania region. This may differ for other regions, as they have representation on WT's committees, whereas Oceania is not represented. Without this representation and without any feedback channels from the grassroots, matters that impact the region's coaches and referees are not taken into consideration.

6.2.6.5 Organisational Support

Taekwondo in the Oceania region and the OTU operate with minimal resources. There are very few in the OTU who receive income from their involvement with the

body's activities. As such, the provision of education across the region needs to be achieved with minimal available funds. Resources, especially human resources, are stretched, and in attempts to address the region's educational needs, great demands are placed on those involved in the region's educational programs.

There is an expectation that any new educational program will embrace technologies. While this may assist in lessening the demands on those involved in the delivery of current education, it will initially entail a demand for greater access to relevant educational and technological skills, such as course designers and information technology professionals.

6.2.7 Relationships

A common theme was the development and maintenance of relationships through the educational programs. Through the educational programs, participants are able to build relationships with colleagues and those in organisational positions. These relationships are an integral component of the success of any competition but also to the professional development and advancement of a referee or coach.

6.2.7.1 Trust

Currently, most referee and coach education is run separately—both in seminars and at pre-competition debriefings. There is a certain level of mistrust between referees and coaches, which can be accredited to the lack of trust and differing degrees of clarity regarding rule applications. Some countries are well known for not being fully current with rules and interpretations or only current with domestic variations of rule interpretations. The current practice of separate educational programs means a greater chance of different interpretations being delivered. It was identified that there is a high percentage of common knowledge for all stakeholders (i.e., knowledge all should possess), including primarily coaches and referees. Participant J noted that relationships

between coaches and referees would be improved if both were receiving the same content at seminars and especially at pre-competition debriefs and training programs:

And that way you are building a bond between and trust between the people acknowledge what we're doing, and also making it better for both parties.

It was considered that trust between coaches and referees is important in the delivery of fair competition and event management. While certain trust does naturally develop between the two groups, it is usually on a one-to-one basis between a referee and a coach. The trust would be enhanced and furthered across a broader pool of referees and coaches with common content delivery. In addition, this would offer opportunities for coaches and referees to gain understanding of each other's issues and frustrations with competitions and with each other.

6.2.7.2 Consistency

One of the biggest issues with competition is consistency in decision-making by referees. Major tournaments draw on a potentially large pool of international referees from differing backgrounds, cultures, languages, etc. The 2019 World Championships, for example, had approximately 100 international referees officiating across multiple contest rings over the seven-day event. As reported by WT (2019), 927 contestants from 145 countries and one refugee team participated.

With such numbers, consistency in decision-making is difficult to achieve, especially with such a diverse pool of referees who are virtually all amateurs who do refereeing as a part-time activity. As noted by Participant C, the referee pool at events is usually comprised of experienced and inexperienced referees:

So therefore, when you go to a big event and you need referees from around the world, you have some that are very experienced and some that are not. The consistency is lost.

Unfortunately, international refereeing is, for most, self-funded and places great demands on the individual referee, especially in terms of finances, family and work. Therefore, it is not always possible for the best referees to attend events, especially major events.

For major WT-sanctioned events (see Appendix C), the international referees are required to arrive two or three days prior to the competition for referee training to address inconsistencies in referee decision-making. For other international events, such as an open, primarily due to costs to the event's organising committee, international referees are required to arrive the day immediately prior to competition. Participant I considered that the benefits of having international referees arrive one day earlier for a training session would be of great benefit:

> *So, a day of training actually helps them. I know that's more time and more money. But if I mean, if you want to bring your team together and be on the same page, that's a really good way to do it.* (Participant I)

Several participants considered other options to address this through the use of technology, including a form of mandatory online modules, would be of similar benefit.

6.2.7.3 People Management

It was felt that an educational program should address aspects of people management. There are situations during competition matches involving coaches, athletes and referees that do not fall under the rules and regulations but require the coach or referee to have a certain level of people management skills. Participant H additionally felt that training on this should include the management of the *entire* ring during a match—that is, not just the athletes during the match but also, for example, are the corner judges doing their work, is the technology working correctly, etc.:

So, that part of the education process—to manage the tournament, to manage the ring, to manage the IRs, that's very important. (Participant H)

Ring management also extends to dealing with ancillary personnel in the surrounding functions of any event, such as the technical support staff, computer operators, medical staff and more. Participants identified that people management was an area lacking in current educational offerings and would be of great benefit.

In addition to person-to-person management, there were considerations of management of an individual coach or referee's development, from grassroots levels to regional levels to elite international levels. This extended to include the management of people who wish to actively continue in roles and contribute to the sport following retirement.

Currently, once a referee retires or is retired, there are very few offerings for these people to continue to be actively involved in the sport. Other sports have avenues and provide opportunities for these people to contribute in new roles, such as mentoring new referees, reviewing matches/competition and so forth. In sport Taekwondo, very few of those retiring have any involvement outside of their own dojang, with the exception of a small percentage who move into committee roles at various levels.

6.2.7.4 Management Managerial Skills

Some participants considered that the educational programs should contain materials on the areas external to a match but of paramount importance in the planning and managing of a competition. Running a competition is no different to any other project, and, depending on the level of the competition, could involve large numbers of people from many different areas and walks of life. Many of these people may not be directly involved in Taekwondo. Typically, a major international event requires

managing areas such as media, facilities, hosting and catering, airport transfers and competition transportation, accommodation, functions, facilities hire and much more.

Competition planning is not an easy task as competitions are rarely capped and so the final number of competitors is usually not known until close to the commencement date. This affects numerous aspects of competition, including the timing of matches, managing of matches, pre-match areas, athlete weigh-in, size and structure of the pool of referees, accommodation and board, and teams. Participant H highlighted some of the non-competition management issues commonly facing a referee chair at an international tournament:

> *It seems like if you are a referee chair, what do you see, and what do you expect with 2,000 competitors. How many matches you going to have? How many referees you going to have? What kind of referees you are going to have?*

These issues are in addition to the standard referee management issues facing a referee chair.

6.2.7.5 Networking

The educational programs are considered to provide more than a process for education and accreditation; they are considered to provide important opportunities for referees and coaches to network and exchange ideas on all aspects of competition (in and outside the competition area). Many international referees use these events to find out about international open events, with the intention of gaining an invitation to officiate. Participant D, when discussing his first joint international training seminar, expressed how he found these an ideal opportunity to gain competition information:

> *And also having that setting with all your peers, I am calling them my peers, there were a lot of top performance coaches in this seminar, so it was a good*

opportunity to network with those coaches and to get their perspectives I guess.

(Participant D)

Coach participants reported also using these seminars to source potential employment opportunities (now that the sport has grown to the point where professional coaching positions are available).

6.2.7.6 Stakeholder Relationships

Sport Taekwondo has become professionalised. It has developed dramatically over the last 25 years, from a sport with very little technology to a sport with highly sophisticated and specialised technologies used in and outside of matches. Coaches, referees and athletes now need to have a sound understanding of these technologies' workings and failings; for example, when the PSS fails during a round. The introduction of match-related technologies has brought with it new stakeholders to work with. Major events being broadcast on television, live streamed on the internet and so forth bring in even more stakeholders to the sport.

It was considered that while a coach or referee does not necessarily need to be fully competent in operating all technologies and knowledgeable of all stakeholders, they do need to understand their purposes and roles. This is especially so for those in the Oceania region, where competitions are run in a vastly different manner to other regions and world events.

6.2.7.7 Unity/Common Goals

There is a certain camaraderie among the referee and coach fraternities. Referees are, for the most part, focused on providing an unbiased platform for athletes to compete within the rules of competition. There is an unwritten bond between referees to assist and work with each other to achieve this:

But I've had a little exposure to people from outside the US in the Taekwondo

refereeing context. And so they're all the same. And that was the first thing I

realised is we're all there for the same reasons, we're all looking at it in a

relatively similar fashion, regardless of all the different backgrounds.

(Participant B)

Coaches assist each other to some degree, but not at the expense of their own athletes. There is often open exchange of ideas, practices and advice between the coaches, but coaches do respond/react to certain matters or topics (such as changes in weigh-in times, durations of rounds, competition schedule changes, etc) impacting on competition and athletes.

While there is this general unity within the two groups, there is not much of a crossover with referees and coaches working together (with exceptions). There exists camaraderie and respect, but occasions for the two groups to work together are limited. An educational model that combines the two groups in the same program should achieve greater unity between them:

When coaches also having that interaction and building a relationship between

players, coaches and officials. […] That way you are building a bond between

and trust between the people to acknowledge what we're doing, and also making

it better for both parties. (Participant J)

Considered additional benefits of having combined educational programs included providing for better and fairer competition.

6.2.7.8 Sense of Team/Togetherness

Due to the nature of face-to-face education and training programs, a sense of team or togetherness occurs. Most participants attend the seminars and training camps to further develop their skills and usually work with each other to do so. Interestingly,

those experienced referees attending solely for reaccreditation purposes became an avenue of this sense of togetherness, as they quite often are the ones that new referees and experienced coaches seek out to confirm understandings of rules and their interpretations when not made sufficiently clear by the course presenter. The OTU previously identified this and commenced running joint educational workshops where coaches and referees attend and participate in course activities together. Following this, WT took note and ran a joint camp for the Olympic coaches and referees prior to the 2012 London Olympic Games. Participants who attended this camp remarked on the sense of belonging together that quickly developed and emphasised that this combined format be used in any revised education program.

6.2.7.9 Teamwork

Teamwork is a major external component influencing the success of a competition match. It is not easy to establish teamwork when the refereeing team changes potentially with every match in a WT tournament. Open tournaments are somewhat different, as the referee chair for that event will normally sort selected international referees into teams that will work together for the entire competition or have only a few member changes. Participant I stated that during these competitions, it is not uncommon for referee teams to participate in team-building activities:

> *It also builds team, like if your team is working together to minimise it. I mean, we talk about that sometimes you have a little mini competition on the side. Okay, our team did this many fights or whatever, but each ring, it should be a team. It should not only be fun, you should support each other, which is really important in that ring.*

Participant I considered these activities helpful for newer referees to become sufficiently comfortable with the more experienced referees to seek their assistance for

their referee development. She noted that this occurs once a certain level of trust has been established between the newer referees and more experienced referees:

> *They're going to be your most experienced and you're trusting them to build*
>
> *their teams. So, you would hope they will also build up your other referees.*

(Participant I)

A small pool of international referees is selected for the Olympic Games—typically around 24—which includes representation from each region. Oceania has a proportionally small representation, usually one or two. The selection process is extensive and for some Olympics has run over several years. During the initial selection stages, teamwork is not necessarily addressed; however, during final selection, there is a focus on the referee team for a match working as a cohesive unit.

Whether the referee team is established match by match or set for the entire event, it is imperative that the individuals have the ability to cohesively work together for the best possible match outcome.

6.2.8 Rule and Interpretation Changes

As with all sports, sport Taekwondo rules change to address various situations. All sports have processes and procedures to react to the requirement for a change(s) to the rules and adoption of changes. Taekwondo is no different. Taekwondo has been growing at a dramatic rate and attracting greater attention since becoming an Olympic sport. This is accompanied by greater demands on the sport, both from its immediate stakeholders and various factors external stakeholders, such as the International Olympic Committee, media, sponsors and so on. To address these demands, the sport is continually undergoing change—to competition rules, rule interpretation and applications, equipment, attire, and game and competition management.

There are two aspects to rule changes in sport Taekwondo. First, there is the process of changing a rule to address the change requirement. Second, there is the change to the interpretation and application of the rule, which may or may not have changed. The first goes through a formal process, including the formal adoption of the rule change by the WT General Assembly. The second is done less formally, and in some cases, may even be on the eve of a competition or during a competition. This is especially the case for matters of athlete safety.

6.2.8.1 Currency and Management

In comparison to most other sports, where rule changes are made and stay in place for fixed periods, sport Taekwondo has no set periods for which competition rules are required to stay fixed; there have been numerous cases of rule changes occurring several times in one year.

The initial competition rules were enacted in May 1973 and first amended in October 1977. Prior to being an Olympic medal sport, there had only been eight amendments to the competition rules—that is, a change every few years. Following the 2000 Sydney Olympic Games (where the sport debuted as a full medal sport), the competition rules were amended in October 2001 and, as of July 2023, have since been amended 21 times, including three amendments in 2022 (WT, 2022a).

While competition rule changes are required to go through the official WT processes, changes to rule interpretations and applications do not. Consequently, changes to interpretations and applications are common and may occur several times in a year. All participants commented on the frequency of changes to rules and interpretations; Participant E especially noted that the rules change at *every major tournament*. There are currently over 27 major WT-sanctioned tournaments being conducted at the world level (see Appendix C).

Neither rule changes nor changes to interpretations are disseminated to the regional or national bodies. Proposed rule changes are distributed to members of the WT General Assembly for comment prior to the rule changes being presented to the subsequent WT General Assembly for adoption. The new rules are then posted on WT's website and WT's education programs are updated accordingly. Changes to rule interpretations and applications—arguably more important than the rules, as these constitute the rules in practice/real-world matches—are not made available or distributed; coaches and referees only are informed of interpretation changes via attending a relevant education program or a competition debrief immediately prior to a major competition. In some cases, for example, the documentation demonstrating the hand signals for referees is deleted or omitted and there is no current official source for that information.

6.2.8.2 Reason for Change

Changes to sport Taekwondo—in rules, regulations, interpretations and applications, the scoring and protective equipment worn by athletes, competition management technologies, equipment, competition areas and more—have been extensive and ongoing since it became a medal sport at the Olympic Games. The changes fall into three broad categories: equipment, spectator and transparency.

6.2.8.2.1 Equipment

All facets of equipment involved in the sport have undergone dramatic changes. Since becoming an Olympic sport, there has been a greater focus on requirements for athletes to have mandatory safety equipment. An athlete is required to provide and wear their own dobok (Taekwondo uniform); shin, groin and forearm protectors; a mouthguard, which has recently been changed to a full mouthguard; scoring socks, which differ between Daedo and KP&P; and protective gloves. This equipment must be

from WT-approved brands; failure to wear approved equipment could result in disqualification. At the 2014 US Open, Nike doboks were no longer approved by WT. A considerable number of coaches and athletes were not unaware of this change; in some cases, they only discovered this when the athlete presented for inspection moments prior to entering the competition area. Athletes then had to either purchase or borrow an approved dobok to be allowed to compete. The US Open is usually the first major international tournament of the year, and information on the rule change regarding doboks had not been disseminated to the regional and national bodies prior to the 2014 competition.

To address transparency in match decision-making, WT introduced electronic scoring using head gear and body protectors (hogue) with electronic devices. The provision of approved electronic headgear and chest protector is the responsibility of the relevant tournament organising committee. The equipment must be Daedo or KP&P; although, depending on the event, an earlier generation or mix of the respective systems might be permitted, usually due to limited financial resources. Different versions being used creates potential issues due to system incompatibilities.

In some rare cases, modifications to rules and/or competition management are made during competition due to athlete safety or external factors. At cadet-level competition, for athletes aged 12 to 14 years, the protective headgear also includes a face shield for athlete safety. When this was first introduced, athletes on the first day of competition found it extremely difficult to breathe due to the face shield restricting airflow. Changes were introduced on the second competition day to allow athletes to remove their headgear during breaks in play:

> *And until we figured out that because they weren't getting enough oxygen*
>
> *through the shields we were told that they should have the helmets kept on. But*

by the second day we figured out it was important for them to take them off in

between [during stoppages]. (Participant C)

This has now become standard practice at this level of competition; however, this

change in rule application has not been recorded or formally disseminated by WT.

Referees and judges in poomsae and kyorugi have their own uniforms,

consisting of a coat, tie, shirt, trousers and Taekwondo shoes. While it is not mandated

that international referees purchase these uniforms from the preferred supplier for

referee uniforms, for most, if not all, components, this is easier but, in many cases, more

expensive. Individual referees are required to purchase the relevant refereeing uniform

themselves.

6.2.8.2.2 Spectator

Prior to becoming an Olympic medal sport, the main audience at Taekwondo

competitions were people who had some form of intimate involvement in the sport.

Entry into the Olympic Games made the sport more visible and led to greater exposure

of the sport. WT rule makers subsequently changed the rules to make the sport more

attractive to the general public and encourage more skilful techniques from athletes:

From the international organisation's [WT's] perspective, Taekwondo needs to

remain a dynamic sport that is audience friendly, and sometimes that means

tweaking the rules. (Participant A)

As previously discussed, WT has made numerous changes to all aspects of the

competition, sometimes changing one aspect several times in one year. Besides changes

to competition rules and interpretations, dramatic changes have been made to actual

competition management, such as the dimensions and shape of the competition area,

positions of judges and physical placement of the referee on the court (centre referee)

while they officiate a match. The latter two changes were made to reduce the visibility

of the judges and referee to the viewing public and focus attention on the athletes competing.

WT has also changed the structure of matches, timing of rounds and number of rounds in a match. Matches prior to 2000 were three rounds of three minutes contested in a 10 m × 10 m court. Competition was single elimination. While there was a provision for round robin contest, where each athlete competed against each other athlete in the pool of athletes, this format was rarely used. There also was provision for a team competition, where teams of five athletes would compete in five single matches; the winning team was the team that won the majority of the five matches.

Since the sport's 2000 full medal Olympic debut, the durations of rounds in single elimination competition have been changed to three rounds of two minutes, three rounds of 1.5 minutes, three rounds of one minute, or one round of five minutes, with the first two being the more commonly used (almost as a de facto standard). The winner of matches conducted under any of these formats was determined by the total sum of points gained in a match. However, WT has recently introduced a 'best of three' round competition format to encourage a more dynamic competition between two contestants.

Competition may be contested either on an octagonal mat with an 8 m diameter contest area or a square mat with an 8 m × 8 m contest area. Most competitions are now contested on an octagonal mat. The reduced contest area (from a 10 m × 10 m court) encourages more aggressive, fast-paced, audience-pleasing play.

The format of the team competition has also been changed to teams of four athletes contesting over three rounds (of four minutes, five minutes and five minutes), with the athletes tagging in and out. This means a far more dynamic contest compared to the earlier team competition format.

As in all sports, Taekwondo coaches and athletes are working within the rules to gain a competitive edge. In some cases, this has made areas of the sport less dynamic and led to valid points being scored with 'non-Taekwondo' techniques. There have been several cases of athletes winning world championships or Olympic medals with the legal use of non-Taekwondo techniques:

Coaches, just like anyone else, are there to find the loopholes in it. So, in finding the loopholes in the electronic system, one might say that the sport became less dynamic, less appealing for the audience, so this requires rule changes to cover those loopholes. And again, coaches react and athletes react. The rules change and they keep evolving. It's like with any sport, it's not just Taekwondo.

(Participant A)

In response, WT has made adjustments and rule modifications; in some cases, prohibiting certain techniques. Athletes and coaches respond to these changes, creating a spiral effect of reaction and counterreaction.

In making frequent changes to make the sport more attractive to spectators and sponsors and address International Olympic Committee requirements, WT has made it difficult for all stakeholders—especially coaches, referees and athletes—to stay up to date, especially given the aforementioned lack of, or limited dissemination, of changes by WT. Participant A noted changes are made to address an issue, but then there does not appear to be any check or review to examine the impact or domino effect of that change across the sport overall:

So I think it begins from the top highest level of the sport to see what the sport looks like overall, and then the adjustments that are made down the line through coaches and athletes.

6.2.8.2.3 Transparency

Prior to the introduction of match technology into the sport, there was very little transparency in the decision-making processes for determining the winning athlete in a match. There were many avenues for biased results and errors, and it was not uncommon for the wrong athlete to be awarded a match. As an Olympic sport, there are great demands placed on sport Taekwondo for transparency in match decision-making. Video review technology now allows coaches and, following recent rule changes, referees to challenge and review actions in a match. The PSS, which initially only scored points for strikes to the body, was later extended (as the technology developed) to score strikes to the head. This further improved transparency. However, PSS recorded any strike to the body or head with no difference in points relating to the actual technique. Judges, using electronic hand-held controllers, would score the punches to the body, the additional point for a spinning technique, and any kicks to the face which are not registered by the PSS. Prior to recent changes to the scoring system, judges only scored points for a punch to the body and head kicks. The rule changes reflect new technologies, increased transparency and WT's desire to make the sport more attractive to spectators:

> *So rule changes are made to make it [the sport] more friendly to the audience and more transparent to anyone that watches it.* (Participant A)

Match technologies and associated rule changes have also created avenues for rule manipulation and questionable decisions, thereby somewhat reducing transparency. For example, if an athlete kicks their opponent in the face and the technology does not record a score but the referee applies a count for the safety of the athlete, the referee may request a video review and, if it was a head kick, then award the points. To the untrained eye, such as a spectator at the Olympic Games, it would appear points are

being given despite the technology saying no points should be awarded. Additionally, the video review process breaks the flow of the match and diminishes its dynamic nature. This could be eliminated by just trusting the technology and applying the existing rules for an injured or knocked down athlete, which would, in turn, create further transparency and provide an even playing field for both athletes:

> *Referees were now given cards of their own rather than quota cards that coaches would have. And in some instances where points, mainly face kicks, happened, then the centre referee needed to count for the safety of the athlete and no points went up. We were given these cards to ask for video review on our own, which was, I think, a big step because sometimes points can be missed for whatever reason. There's other reasons.* (Participant C)

As stated by Participant C, this process is standard/stipulated by WT and should be applied at all levels of competition; yet, it is not documented, nor has it been disseminated to regional and/or national levels.

6.2.8.3 Rule Interpretation

The current situation of interpretations not being disseminated by WT to regional and national bodies means competition will continue to be run under different interpretations. This can severely impact athletes, coaches and referees. Coaches and athletes going to higher level competitions and/or competitions in other countries or regions will likely be confronted with unfamiliar rules that prohibit their learned match tactics and strategies. There have been instances of athletes selected into representative teams based on winning a selection competition under different rule interpretations to those being used in the competition they have been selected to contest. Referees must enforce the stated rules for the respective competition to ensure consistency across all the courts in that competition. There is a desperate need for official dissemination of

WT rules, interpretations and applications to ensure consistency in rules at all levels of competition. Participant A noted that such consistency is crucial for athletes and coaches to know they are training appropriately and correctly based on rules that are consistent at all levels of competition:

> *So the coaches will see the rules implemented without fear of making their athletes be in a situation where they will lose and not able to go forward nationally.* […] *It's really training for the athlete so that they will learn how rules are being interpreted and training for the coach so that they will know how the rules are being interpreted and enforced.*

Participants I, J and L reinforced this view and also stated the importance of having a complete and correct understanding of the rules and interpretations. Participant B affirmed this and further explained that fluency in understanding and application is required, which should be developed, enhanced and reinforced by the education process for coaches and referees. This fluency is attained and developed through the education process and not just from reading the rules. He also stressed that the same interpretations must be articulated across all languages and come from one source:

> *Well, I mean, the point is that the game happens on the level playing field. You've got the correct application of the rules, the ability to respond to the situation. I mean, I think in terms of preparing for that, first, you've got to be fluent in the rules. I mean, some of it is, of course, you just read them and understand them. But most of it is that interpretation piece of it that we get from the educational process. And from the discussions we have with each other and around analysis of it.* (Participant B)

6.2.8.4 Standardisation and Consistency

There was considerable discussion by participants on the standardisation of *all* components of competition, not just rule interpretations and application, especially competition equipment. For example, while there are two WT-approved suppliers of the PSS (Daedo and KP&P; see Appendix H), the two systems differ in many aspects (Hong, 2014). Daedo uses electromagnetic technology and KP&P uses radio frequency identification. The likelihood of a technique scoring differs from one technology to the other (Marquez et al., 2022). There are differences between the systems' software, processes for pre-match inspection, handheld controllers used by the judges and information displayed on 'live' scoreboards. A detailed comparison of the Daedo and KP&P PSSs is provided in Appendix I. Similarly, as previously discussed, Taekwondo competitions now use video review technology. The standard is Dartfish, but many competitions use alternative versions, ranging from iPads to locally developed products.

All participants considered it imperative that rules, regulations, interpretations, approved competition equipment lists, etc. come from one source and that this source be at the highest level—that is, WT. Accompanying this is the crucial need for all information (approved changes, modifications to competition aspects, etc.) to be immediately disseminated by WT to the regional bodies and national bodies:

> *So the further up the chain the source materials can come from, the better, you know. It's coming directly from the WT referee chair, that's probably the ideal thing, or the committee or whatnot, so that everybody is seeing the same thing.*
> (Participant B)

Without this communication, standardisation is not possible and competition environments and rules will continue to differ from one location to another. Importantly, this standardisation means consistency across *all* aspects of a competition:

So we're on the same page. So that's where the education piece means you got to say, you got to find out what is the interpretation that we're all going with so that we do it consistently; because if I am the athlete, of course I want to have the same experience in court number 1 as I do in court number 10, and that's only possible if the referees are on the same page. (Participant B)

A common complaint from coaches and athletes is that referees have differing interpretations of rules and apply them differently in the same competition. While every effort is made to address and minimise this through pre-competition training and debriefs/updates held prior to the start of each competition day, this is not a simple task, given that the referee pool for a competition often comprises those international referees who are available for the event. International refereeing for sport Taekwondo is currently not a full-time profession and, in most cases, is an occupation totally self-funded by the individual referee. The pool of referees at any event is often a mix of experienced referees and referees with very little international experience.

6.3 Chapter Summary

This chapter has presented the findings from the interview data. The interviews with referees and coaches with extensive experience in Taekwondo (the martial art and the sport) provided information and understanding on the shortcomings of the current educational offerings in the Oceania region. They also provided valuable insights into the needs and requirements of an educational framework suitable for the Oceania region—a topic on which there has been very little research.

The expected themes of embracing technologies and increasing accessibility and affordability were common across all interviews. Additional themes were the reliability of course materials; one source disseminating correct, up-to-date content; shortage of suitable information and material; and desire for additional educational offerings (on

subjects related to competition that are not addressed in current educational programs). The findings from the interview data were used to assess how education should ideally be provided within the Oceania region and subsequently used in the development of the educational framework proposed by this project.

The next chapter presents the proposed framework for the delivery of coach and referee education within the Oceania region. The chapter also concludes this thesis, providing a summary of the project and its findings, the implications of the findings, the limitations of this project/research, and future research directions.

Chapter 7: Findings, Conclusions, Implications and Future Research

7.1 Introduction

This study was carried out for the OTU, through UTS's IDP, to investigate problems and issues in the provision of sport Taekwondo education for coaches and referees within the Oceania region. The investigation used a phenomenological approach—in-depth interviews supported by the researcher's observations—to identify and examine the issues and problems surrounding and impacting coaches, referees and other stakeholders in the region at all levels of the sport (from grassroots to elite level).

This chapter commences with an overview of the project (Section 7.2). Subsequently, a model and two sub-models based on and developed through the research findings are presented (Section 7.3). These models address this project's research question, providing a framework for coach and referee education in the Oceania region. Required changes in structures external to but impacting the delivery of education in the region are also discussed (Section 7.3.4). The chapter then considers the implications of the findings (Section 7.4), the limitations of this research/project (Section 7.5) and directions for future research (Section 7.6).

7.2 Overview of the Project

Change constantly occurs in sporting organisations (Fenton et al., 2022; Paek et al., 2022; Salimi & Nazarian, 2022; Torres-Ronda et al., 2022). Further, sports themselves usually experience continuous and often complex change (Leveaux, 2010). The sport of Taekwondo is no different. Changes to the sport affect many, if not all, stakeholders. One participant stated that keeping up to date with the changes in sport Taekwondo requires constant effort, to the extent that not attending one or two

international events can considerably affect a stakeholder. While some changes to rules and interpretations may be subtle, it is the frequency of the changes that greatly affect the sport. Compounding this is the extremely limited avenues for coaches and referees to keep up to date, especially in the Oceania region.

This project aimed to determine the optimal education offering and platform for sport Taekwondo coach and referee education in the Oceania region. As such, the project first identified and examined the issues and problems surrounding and impacting coaches, referees and other stakeholders in the region at all levels of the sport. To address the identified issues and problems, the OTU needs to change its delivery of education for coaches and referees. The constantly changing competition environment necessitates the OTU be more creative and proactive in developing approaches, methods and structures for coach and referee education. The OTU must be able to rapidly adapt to competition changes in ways that benefit all member countries, assist in the development of the sport, and create pathways for referees and coaches to officiate at elite-level competitions regionally and internationally.

Consideration of an appropriate education framework entailed ensuring the educational content to be delivered uses the current version of the competition rules, interpretations and application and is standardised across the region. While the problem is not focused specifically on culture, the diversity of the Oceania region necessitates the solution address several cultural factors (including language, religion, education, distance and class) that affect the educational opportunities of coaches and referees. The next section presents this project's proposed models.

7.3 Proposed Models

This project produced a framework consisting of an overarching model and two sub-models:

- Adaptive Learning Model—the overarching model for the framework.

- Educational Content Model—sub-model relating to course content.

- Education Delivery and Income Model—sub-model relating to the delivery methods and income generation.

These models are discussed in turn in the following sections.

7.3.1 The Adaptive Learning Model

The Adaptive Learning Model (see Figure 7.1) is the overarching model for the proposed framework. It has been identified that there is a large amount of knowledge/course content relevant to and necessary for coaches, referees and other competition stakeholders. There are three main areas of content:

- Referee and Coach Core Competition Topics

- Competition Rules and Rule Application

- Competition Management

Figure 7.1

The Adaptive Learning Model
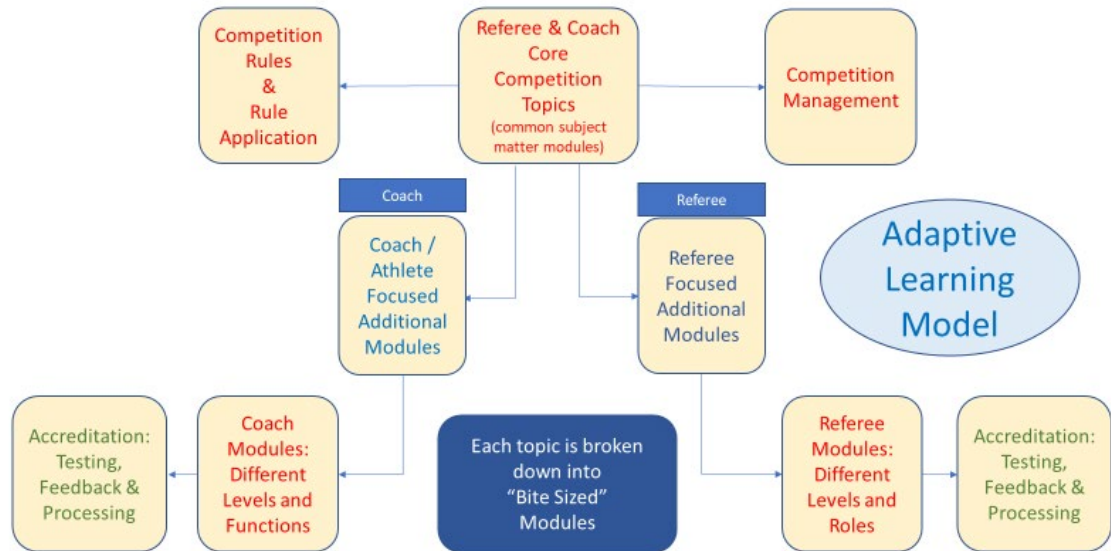
7.3.1.1 Referee and Coach Core Competition Topics

These components consist of a series of topic modules specific to competition of which both coaches and referees must have strong understandings. This would include areas such as a breakdown of how points are scored, penalties and how they are applied, weight categories and weigh-in processes, etc.

7.3.1.1.1 Modules

A key to effective education programs is having the content broken down into bite-sized topic modules organised into logical blocks of modules, such that a course participant can focus on specific areas in which they lack knowledge or only need updates (i.e., a particular module or block of modules).

Each topic module would potentially have three focus areas to it. The first component of each module is the core module for that specific topic area, for example, the actual rule and its application. Each topic module would have two or more micro-modules. The micro-modules would be a breakdown of the topic with specific focuses;

for example, a micro-module of a rule that is specifically focused for coaches and a second micro-module on the same topic but specific to referees. As another example, the weigh-in module might consist of:

- Core module: The different weight categories and rules surrounding an athlete weighing-in.

- Micro-module 1: Processes related to the athlete before, during and after weigh-in.

- Micro-module 2: Processes, functions and reporting required of the international referee during and after the weigh-in.

The micro-module could also be a topic within a core module that is common to multiple stakeholders.

All parts of all modules would be available to any stakeholder, including those who are not a referee or coach. This would allow for a crossover of content to all relevant parties; for example, a coach would have access to directives given to referees via the referee micro-module and vice versa.

These modules and micro-modules would be easily updated (e.g., to reflect the current rule interpretations and applications) and would be an easily accessible, single source of correct information.

7.3.1.1.2 Learning Management System (LMS)

The entire educational program would ideally be developed and managed via a LMS. As the OTU is not an affluent organisation, it is expected that it might engage in using an open-source LMS tool, such as Moodle, to run the education program.

If funding were to be made available, it would be preferable to have the education module designed by professional learning designers with skill sets in this area and in consultation with one or more technical competition representatives.

7.3.2 Educational Content Model

The Educational Content Model (see Figure 7.2) relates to the course content in the education program. Currently, the content in the majority of educational programs focuses mainly on competition rules and is usually delivered article by article from WT's *Competition Rules and Interpretations*. While this does address the basic content required, it does not address matters surrounding competition rules—areas in which coaches and referees are required to have knowledge. This extends to competition procedures and technologies used in competition. There is extremely limited education provided on the latter, usually restricted to understanding the scoreboard displays. This project identified three areas in which a coach and/or referee would require additional information:

1. competition rules, their interpretation and application
2. competition procedures and non-match matters
3. technologies used in competition.

Figure 7.2

Educational Content Model
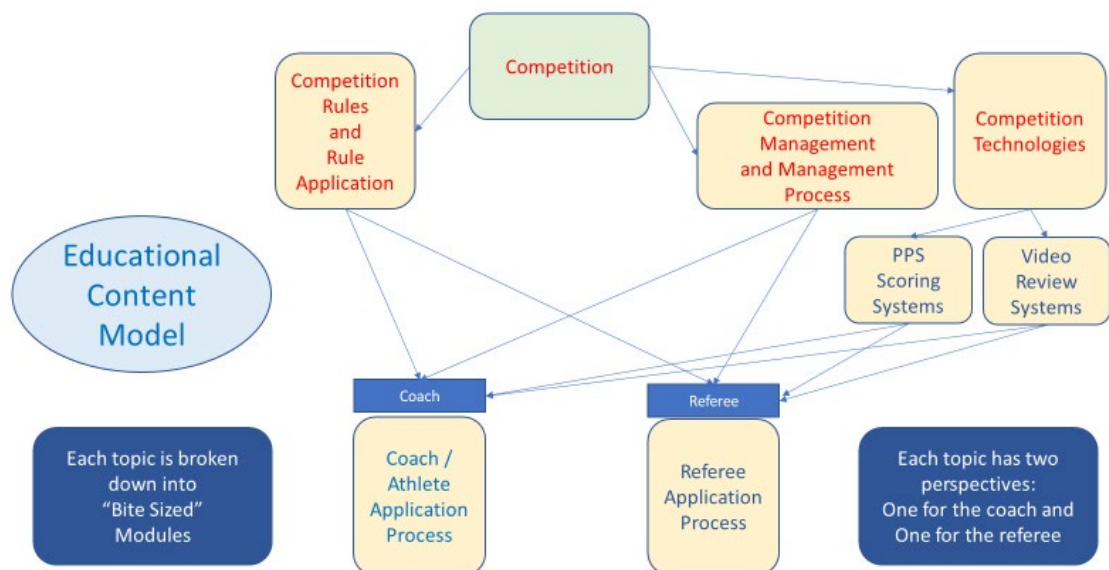
Content in the Educational Content Model would be grouped into logical modules of related rules, regulations and their applications. The grouping of content would be related to specific areas of the sport, such that there are logical groupings of related competition material. Some modules may contain multiple articles of rules; conversely, some modules would not necessarily be tied to a specific rule or article but a component of competition. An example of the module structures with these differences can be found in Section 7.3.2.3. A suggested breakdown of the articles, rules and components within the content modules and micro-modules is provided in Appendix J.

7.3.2.1 Competition Rules, Their Interpretation and Application

Current rules, interpretations and application would be grouped into logical units aligned to components of a competition. For example, the rules related to an athlete, such as dan grading, weight and nationality, which are currently spread across several articles, would be grouped into one module with the relevant micro-modules sitting underneath. The micro-modules would be designed to identify matters specific to the relevant stakeholder—coach, athlete, referee or competition manager. It would then provide specific locations for the stakeholder to locate all relevant required information on that area and thereby eliminate the potential for multiple interpretations of a rule or area.

7.3.2.2 Competition Procedures and Non-Match Matters

External to the rules that are applicable specifically to a match are rules and regulations that must be adhered to in any competition. These include the setup of a competition area, weigh-in procedures and set up, athlete's equipment, eligibility of athletes, coaches and team medical staff. Such matters would be incorporated into their related modules.

7.3.2.3 Technologies Used in Competition

There are currently two technologies used in competition: video review and the PSS. These are discussed below.

7.3.2.3.1 Video Review

The WT-approved video review system is provided by Dartfish; however, some competitions use other video review systems. A video review can be requested by either a coach or centre referee. There are constraints and rules around the request for a video review and set procedures to be followed by both a coach and centre referee; for a coach, failing to follow the correct process could see the video review request dismissed prior to the footage actually being reviewed. Once a video review has been successfully requested, the review is processed by the video referee, who also has required processes to be followed to ensure the request is actually within the scope of a video review. Additionally, the video review is broadcast to the audience via the video review referee using a toggle box to switch the scoreboards to display screens. The review process is managed by the video review referee, who will also be running and controlling the Dartfish system, usually via a form of compatible joy stick/toggle box allowing for different views from the different cameras, slow motion and zooming features. The current education process for video review referees is basically 'learn on the job'. There is no course material and brief instruction is usually only given prior to the start of a competition.

The course content for video would be structured such that there is a module on video review. The core module would contain the relevant article as per WT's *Competition Rules and Interpretations*. There would be four micro-modules containing educational materials for referees, coaches and competition management, as follows.

Video Review Module:

- Core module: Instant Video Replay (Article 21)—the rules, interpretation and explanations of the applications of instant video replay (IVR) with examples and clips of requests.

- Micro-module 1: Processes of IVR that are specific to a coach requesting a video review (e.g., timing of the request).

- Micro-module 2: Processes of managing an IVR request from the perspective of the centre referee, processes of managing the request and the determination by the review juror, and processes of managing the technologies (controllers, toggle box, software) associated with the video review by the review juror.

- Micro-module 3: Setting up the video review system (Dartfish), cameras, switches and broadcast feed if applicable.

- Micro-module 4: Processes for a protest when video review is not available.

7.3.2.3.2 Protection Scoring System

There are two WT-approved PSSs: Daedo and KP&P. While the two systems are designed with the same goal of registering scoring techniques, they are quite different in their set up, management and pre-match inspection processes. The PSS has been previously discussed in Section 6.2.8.2.1.

There is no specific WT rule or article pertaining to the PSS; however, there are over 40 references to the PSS in the competition rules. The content for the PSS module would be structured such that there is a core module covering the general components related to the two PSSs (Daedo and KP&P) and micro-modules specific to Daedo and others specific to KP&P. While these modules would be focused towards referees and

competition management, the micro-modules related to problems and fixes would also be applicable to coaches.

Other matters related to the PSS would be continued in the relative module or micro-module; for example, matters related to the athlete's PSS socks would be under the module related to athlete's equipment.

PSS Module:

- Core module: Overview of PSS.

- Micro-module 1: DAEDO—setting up and testing of the Daedo PSS, managing the software and running the Daedo system in competition.

- Micro-module 2: DAEDO—problems, crashes and processes to fix.

- Micro-module 3: KP&P—setting up and testing of the KP&P PSS, managing the software and running the KP&P system in competition.

- Micro-module 4: KP&P—problems, crashes and processes to fix.

7.3.2.4 Content Management

It is imperative that all content is managed and maintained through one source and that this source is the owner of the content. Ideally, this would be the world body/WT. However, in the current climate, this may not be organisationally possible. To address this, it is necessary for the OTU to have representation on the relevant decision-making committees (see Section 7.3.4.1) and active input into decision-making processes. Any time the content is updated, the content owner would electronically send notifications to all MNAs and all accredited referees and coaches, whose email contact details would be captured at initial registration and updated as necessary.

7.3.2.5 Specific National Requirements

While the proposed model does address the requirements for coach and referee education across the Oceania region and is aimed at eligibility for competition, some

countries require coaches and referees to complete domestic courses or requirements particular to that country to be eligible to officiate in that country. For example, in Australia, coaches are required to complete several external courses, in addition to their WT coaching course, as part of their accreditation (Play by the Rules Harassment and Discrimination course, Sport Integrity Australia – Anti-doping Fundamentals course, etc.). Such courses and the completion requirements are country specific and, as such, fall outside the scope of this project.

7.3.3 Education Delivery and Income Model

The Education Delivery and Income Model (see Figure 7.3) outlines the structures for the OTU to deliver the education program, the structures for accreditation and the avenues for income generation.

Figure 7.3

Education Delivery and Income Model
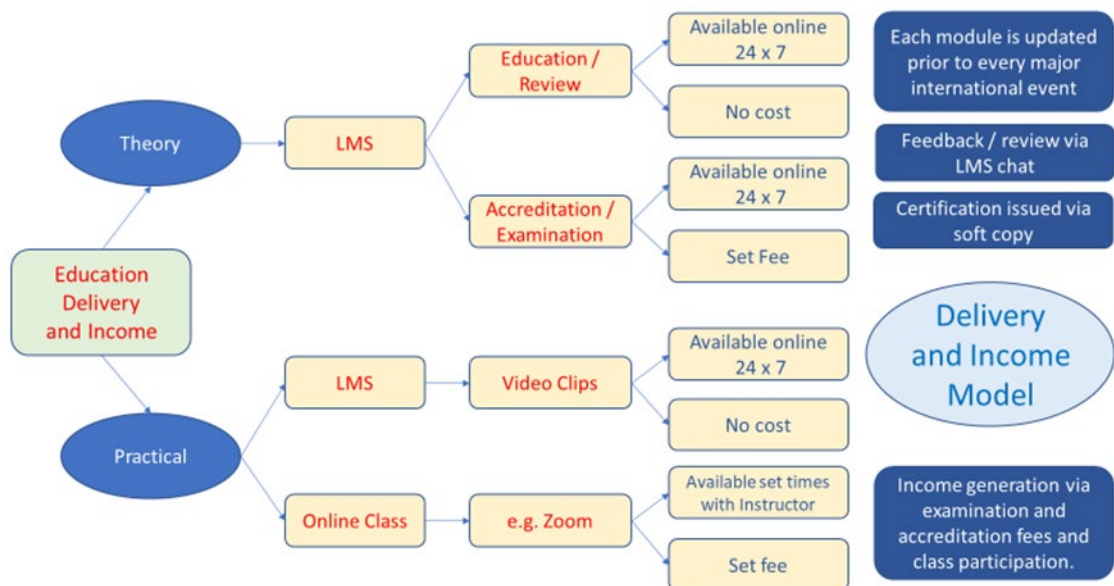
Note. LMS = Learning Management System.

The education program is broken down into two distinct areas: the delivery of the theoretical components (primary area) and the delivery of the practical components (secondary area). Both these areas would have the relevant testing modules attached to

ensure that referees and coaches attain the required practical and theoretical knowledge for the respective accreditation level.

7.3.3.1 The Education Program: Theory

The theory component of the model would be available 24/7. The content would be structured such that rules are broken down into logical components related to specific areas of competition. For example, the rules related to an athlete's weight would be in one topic area, which would be broken down into smaller modules, as shown below:

Logical Module: Athlete's Weight

- Submodules:

    o Weight categories >> Different categories.

    o Weigh-in >> Day before competition >> Coach and athlete procedures.

    o Weigh-in >> Day before competition >> Referee procedures.

    o Weigh-in >> Day before competition >> Competition management procedures.

    o Weigh-in >> Random weigh-in >> Coach and athlete procedures.

    o Weigh-in >> Random weigh-in >> Referee procedures.

    o Weigh-in >> Random weigh-in >> Competition management procedures.

Each module and submodule would be updated to reflect any changes to rules, interpretations and/or application.

Prior to an event, the relevant organising committee releases an information package containing the necessary information relating to that competition. The package normally includes information such as the venue, competition schedule, accommodation, which PSS is going to be used and so on. This package could also

contain a link to the LMS, which then provides all changed rules, interpretations and applications leading into the competition.

Coaches and athletes would then be able to review and refresh themselves online, prior to the event, at a time suitable for them. Referees appointed to officiate at an event would also be able to do this, thus ensuring they are familiar with the up-to-date information and able to fully prepare for the upcoming competition.

The LMS could also be structured such that it reports back to the organising committee and/or competition referee chairperson who, of the appointed referees, has completed the pre-competition review. It could also be structured to hold referees' and coaches' accreditation for the specific competition and only release a person's accreditation upon them completing the pre-competition review. This would ensure that all relevant stakeholders in any specific competition are familiar with the latest rule interpretations and how they will be applied in the upcoming competition.

This content would be available at no cost, thus providing a facility for all in the Taekwondo community to access the most current and correct information on all aspects of competition. This would greatly decrease the costs imposed on individuals in gaining up-to-date information. Additionally, having the structure of small specific modules would allow any interested parties to review only the modules for which they are seeking information.

7.3.3.2 The Education Program: Income Stream

The LMS would be structured such that access to content is free, but access to other components and offerings would cost a fee. This would provide the OTU with a revenue stream.

Referees and coaches are required to have accreditation to be eligible to officiate at any event. This accreditation differs from competition accreditation in that

competition accreditation is authorisation to officiate only at a specific event. Referee and coach accreditation is, in effect, a licence to referee or coach. (In some countries and regions, the accreditation is actually referred to as a license.) Referee and coach accreditation is attained after the completion of the relevant course and achieving a satisfactory result in the relevant testing for that accreditation. For example, for a person to attain referee accreditation, they must complete the relevant course and achieve a certain grade on both written and practical tests.

It is expected that the LMS will have user pays components, including access to accreditation testing. Income would be generated through payments for testing and accreditation and reaccreditation fees.

The theoretical testing would be organised such that it is available online 24/7. The testing would be structured such that upon commencing the test, a set time period is available to complete the test. Upon completing the test (or the time period expiring), the applicant would be provided with formative and summative feedback. The test would be generated from a bank of randomly chosen questions. Each question would ideally be a situational, multiple-choice question where the applicant is asked to choose an answer from a set of responses. The post-test feedback would include a brief explanation of the correct answer for each question the applicant answered incorrectly.

Upon achieving a passing grade, the applicant would be automatically issued a softcopy/digital certificate stating that they have satisfactorily completed the theoretical component of the relevant accreditation. This component would not necessarily be a complete accreditation for referees, as a referee is expected to also be competent in the actual application of rules and regulations and general match management. This necessitates practical assessment (see Section 7.3.3.3). However, the theoretical component only may be sufficient for coaching accreditation and possibly other forms

of accreditation such as WT's Technical Delegate accreditation. Therefore, for these accreditations, upon an individual achieving a passing grade in the theoretical testing, they would gain the relevant accreditation. The accreditation would automatically be registered on the OTU's database.

In addition to the immediate formative and summative feedback, the OTU could establish set feedback sessions using the chat/breakout rooms available in the LMS, or even externally to the LMS via Zoom or similar applications. These would be more of a general feedback or drop-in session arrangement.

7.3.3.3 The Education Program: Practical

The practical components would be broken down into two streams: (1) a series of instructional video clips hosted on the LMS and (2) video clips submitted by applicants of themselves (a) performing the practice aspects of refereeing and (b) officiating a competition match.

The instructional video clips would be structured such that they are linked to the relevant rule or interpretation. This would allow users to see how the rule is applied and in what situations. There have been many situations in competitions where an application of a rule was correct but misunderstood by some stakeholders due to unfamiliarity with the most recent WT update. These video clips would be available 24/7, alongside the theoretical components, and accessible at no cost.

In addition to the video clips being used to enhance the explanation of a rule or component of a rule or interpretation, they would be used as a component of training. WT has developed a mobile phone app that simulates a handheld scoring controller. This app is used by WT as part of its testing protocols for international referees. The OTU needs to either acquire licensed access to this app for its members or develop a

similar app. This would allow referees to practise and develop their individual scoring skills using the video clips.

To address the practical match management components for referees, online classes would be set using open-source tools such as Zoom. Enrolment would require payment of a subscription fee, and the access code or password would be sent electronically to participants close to class commencement. These classes would be specifically for training purposes and under the instruction of one of the OTU's educators.

For the assessment of an individual referee, the referee would electronically submit a video clip of themselves performing a set series of practical signals, movements, etc. Further, as competition matches are video-recorded for video review, the referee would electronically submit a video of a match they officiated. The referee would have to pay a fee online to complete their submission. These submissions would be reviewed and assessed by the OTU's educator, who would then provide formative and summative feedback to the referee. This assessment would form the second component of the referee's accreditation. Upon passing this component (after having previously passed the theoretical component), the referee would gain referee accreditation.

This process would allow a referee to seek accreditation in their own time and without having to travel to an in-person accreditation seminar. It also allows OTU educators to assess referees from across the region without needing to travel. While this assessment could be done live via Zoom by establishing set testing times, this removes the aspect of flexibility and adds another layer, as the assessment cannot be completed until the video clip of the referee is received by the educator for assessment and feedback.

7.3.4 External to the Education Framework

There are factors external to the proposed educational program that have direct and indirect impacts on the educational program, regional stakeholders and program pathways.

7.3.4.1 Representation and Input Into Decision-Making Processes

The OTU should approach WT to ensure it has at least equal representation (relative to the other WT regions) on WT's committees and input into WT's processes. As a developing region with challenges very different to the other four regions, this is imperative for the Oceania region's success and growth. Currently, the OTU has very little representation on the relevant committees of WT. Therefore, decisions are being made with little or no consultation with the region and, thus, little understanding of the problems and issues at the grassroots levels in this region.

The Oceania region is very different to the other four regions and continually struggles due to many factors, including the disposable income of individual Taekwondo practitioners and national bodies, organisational infrastructure issues within individual member countries, lack of physical resources, distances, varying educational standards and more. Many regional issues are not considered by WT's decision-making processes in relation to competition rules, competition environment and athletes.

It is crucial that the OTU seeks and gains representation on all WT committees related to competition, specifically:

- Athletes Committee

- Coaches Committee

- Education Committee

- Games Committee

- Poomsae Committee

- Kyorugi Committee

- Para Taekwondo Committee

- Para Taekwondo Classification Committee.

Currently, while there are regional equivalents of many of the above committees in Oceania, the OTU only has representation on one of the above committees. Ideally, the chair of the relevant regional committee should have representation on the respective WT committee. A full list of WT committees with OTU representation is provided in Appendix K.

7.3.4.2 Regional Adoption of the Education Model

Currently, no standard education model has been adopted across all countries in the Oceania region. Some countries use the OTU's offerings, some have their own programs, and some use the programs of countries outside the region. To ensure a standardised understanding and application of rules and interpretations, the OTU must work with all member countries to have them adopt the OTU's educational program. Uniform adoption of this one program will enable greater transparency and clarity in referee decision-making in competitions and provide fairness in all stakeholders being aligned with and operating under the same rules and interpretations across all competitions.

While it is recognised that the model does not specifically address individual country's accreditation requirements (see Section 7.3.2.5), the OTU should work with countries to structure these as additional modules or components external to the model to be passed for coach or referee accreditation in that country.

7.3.4.3 Regional Adoption of Standardised Referee and Coach Accreditation Levels

Each country in the Oceania region either has their own accreditation levels or no accreditation levels. There is no standardisation of accreditation levels at the country or regional level. This can cause problems when a person wishes to seek international referee accreditation with WT or if a person moves to another country as their accreditation cannot be transferred. WT accreditation commences at the bottom end of elite-level competition, and it is required that a person has achieved the top accreditation level within their country prior to attending a WT course for international referee accreditation.

To address this and provide avenues for opportunities for regional coaches and referees to officiate in other countries within the region, it is recommended that a standard set of accreditations be adopted across the region for coaches and referees. Table 7.1, on the following page, details the recommended accreditation levels for referees and coaches and the recommended advancement criteria. Current national accreditations would be converted to an equivalent regional accreditation.

Table 7.1

Recommended Levels of Oceania Region/OTU Referee and Coach Accreditation

Referee or coach accreditation	Advancement criteria	Notes
Regional class 4	Complete the course with 50% grade or higher.	Entry point/beginner. Able to officiate at certain levels in all competitions within a country in the Oceania region in the following activities: technical assistant/computer operator, corner judge, inspection, and weigh-in.
Regional class 3	Complete the course exam with 60% grade or higher. Officiated in four events.	Able to officiate at certain levels in all competitions within a country in the Oceania region in the following activities: technical assistant/computer operator, corner judge, inspection, weigh-in, and centre referee in coloured belt matches.
Regional class 2	Complete the course exam with 70% grade or higher. Officiated in eight events.	Able to officiate at all levels in all competitions within a country in the Oceania region and assist at certain levels at regional competitions in the following activities: technical assistant/computer operator, corner judge, inspection, and weigh-in.
Regional class 1	Complete the course exam with 80% grade or higher. Officiated in 12 events.	Able to officiate at all levels in all competitions within a country in the Oceania region and assist at certain levels at regional competitions in the following activities: technical assistant/computer operator, corner judge, inspection, weigh-in, and centre referee in coloured belt matches at regional competitions.

The accreditation levels shown in Table 7.1 are the default standard. There should be provision to fast-track referees who have been identified as potential international referees and met all other criteria except the time requirement.

7.3.4.4 Establishing Pathways from Grassroots to Elite-Level Refereeing and Coaching

When a person first attempts to gain international referee accreditation and subsequently officiates at their first event, this is usually the first time the person has officiated outside of their country and can be a daunting experience. By having a standardised regional accreditation system, regional referees and coaches can officiate in other countries within the region and gain international experience. The OTU should seek similar arrangements with other regions to further expand such opportunities. The OTU should also negotiate with WT to have individuals with regional accreditation officiate in some roles at WT-sanctioned events (e.g., weigh-in). This would assist in creating a logical pathway from grassroots to elite-level competition.

7.4 Conclusions and Implications

The proposed educational framework would provide a far more accessible educational tool for coaches and referees in Oceania and a potentially increased revenue stream for the OTU. The framework would provide a platform for stakeholders to have ready access to up-to-date and standardised rules, interpretations and applications. It could be used to inform stakeholders of competition rules and requirements and other competition-related information in an easily accessible form and with little or no cost to individuals. The model would allow referees and coaches to flexibly attain their respective accreditation with minimal cost. This would be a significant improvement over the current situation, greatly reducing time and financial costs for course participants. This model would also provide an income stream for the OTU while

reducing its costs in relation to the delivery of education. Additionally, the model's delivery of significantly decreased participant costs for coach and referee education has the potential to increase the number of people seeking coach and referee accreditation. This would result in increased income for the OTU. Further cost savings could also be achieved by having pre-competition work delivered and completed online, thereby reducing the length of in-person pre-competition training sessions. Finally, the model would standardise regional referee and coach accreditation in Oceania. This would provide an avenue for regional referees to officiate at competitions in all OTU member countries and thereby gain international experience. It would also create pathways from grassroots to elite-level competition for referees and coaches.

7.5 Project/Research Limitations

This project focused on addressing issues affecting the OTU member countries and optimising education for regional coaches and referees. The Oceania region is a developing region with limited resources and the only WT region with member countries with minimal numbers of internationally experienced coaches and referees. Some Oceania countries have no internationally accredited or formally educated referees. This shortage of suitably qualified and experienced coaches and referees within the region was apparent during this project's participant recruitment, necessitating the project to seek participants outside the Oceania region. This could be a limitation of the research, given that the project was for the Oceania region. However, as previously stated, the data were analysed in relation to factors present in the Oceania region; specific data pertaining to non-Oceania participants' regions or countries were not considered in the analysis. Further, including participants from outside the region provided valuable insight into (1) potentially similar problems being experienced by

coaches and referees in other regions and (2) issues that could, in future, be faced by coaches and referees within the Oceania region.

The sample size (n=12) could be considered a limitation. However, as previously discussed in Sections 5.2.1 and 5.7.6, this sample size was sufficient for the project. Additionally, as previously stated, data from non-Oceania participants (n=6) supported the data from regional participants (n=6).

The potential limitations regarding interpretive bias by the researcher have been addressed in Section 5.7.6. The assumptions of the interpretive research paradigm were appropriate, as exhaustively discussed in Chapter 4. The trustworthiness of the findings (credibility, dependability, confirmability, transferability and authenticity) was established in Section 5.7.

Finally, the generalisability of the findings may be limited. In interpretive phenomenological research, there is no assertion that the results can be generalised. However, the insights from this project have provided a rich and detailed understanding of the issues and problems affecting the delivery of sport Taekwondo education for referees and coaches in the Oceania region.

7.6 Future Research Directions

The limitations of the methodology employed in this project and possible expansions of the project scope provide opportunities for further research. This project was focused on the regional level (i.e., the Oceania region). While the phenomenological approach provided suitable data for this project, the project scope could be expanded to examine issues from grassroots perspectives and the perspectives of coaches and referees who have retired or are close to retiring from domestic and/or international competition.

This work could be repeated in the other WT regions and/or on a global level to potentially develop a single solution for use across all WT regions based on the framework proposed in the project. Alternatively, the project could be adapted for other regional and/or national bodies to develop a more localised, targeted approach, as was done in this project for the Oceania region. Further, domestic-level accreditation of coaches and referees varies from country to country; therefore, this project's scope could be expanded to address specific country requirements and potentially incorporate such requirements as an extension(s) to the project (as touched on in Section 7.3.4.2).

While this project was specifically for the sport of Taekwondo in the Oceania region, the project could be revised and adapted for other sports. However, applying the research method and/or proposed framework to other sports would first require an in-depth analysis of the sport, as was undertaken in this project for Taekwondo.

The OTU operates under considerable restraints, one being limited financial resources. However, if adequate funding was made available, this project could be extended to address the development of educational programs using artificial intelligence and virtual reality. This would provide exceptional benefits in the development and education of coaches and referees. Artificial intelligence is increasingly advanced and available, and artificial intelligence–based coaching and referee education systems could provide personalised feedback and insights. Similarly, virtual reality has gained significant attention in sports and various other fields (medicine, education, entertainment, etc.). Virtual reality could transform referee and coach education into interactive and immersive training experiences, including simulations of competition scenarios that would be difficult to replicate in standard training environments. Virtual reality would be able to provide a controlled

environment where referees and coaches can practise their decision-making, match management and communication skills.

This project has laid foundations for further investigation of the factors that influence referee and coach retention. A coach or referee retiring takes with them a wealth of experience. Some sports provide pathways for retired persons to continue to have input and roles and participate in the sport. These roles include mentoring, advising, educating and the like. Taekwondo does not currently have any such roles.

While this project was exploratory, with a qualitative approach being used to identify the factors affecting coach and referee education in the region, a quantitative methodology could be used to validate and measure the impacts of the framework's adoption and implementation by the OTU. Such quantitative studies could assess the success of this framework via developed metrics and identify areas requiring improvement.

7.7 Chapter Summary

This section provides a detailed description of the results of this project. The aim was to develop an educational model for the Oceania region which would provide referee and coach education for the region that is far more accessible, cost effective, affordable for the sports stakeholders while providing a potentially increased income stream for the regional body.

Through the findings of the project an educational framework was presented along with some recommendations and avenues for additional research and work emanating from the project.

The educational framework consists of a model with two sub-models. The Adaptive Learning Model is the overarching model under which the two sub-models, the

Educational Content Model and Educational Delivery and Income Model. The Educational Content Model presents structure and management of course content, while the Educational Delivery and Income Model presents the processes of the delivery of theory and practical components of the referee and coach education, along with the avenues for income generation.

The chapter additionally discusses the technologies both in the sports and in the delivery of stakeholder education with respect to the region. Additionally, recommendations are made for the OTU's consideration on factors that are technically external to the educational framework, which have both direct and indirect impact on the educational program.

The chapter concludes with implications of the implementation of this project, as well as presenting the limitations of the project and recommendations for future research directions.

Appendices

Appendix A: Oceania Taekwondo Union Member Nations

American Samoa	New Caledonia
Australia	New Zealand
Cook Islands	Palau
Federated States of Micronesia	Papua New Guinea
Fiji	Samoa
French Polynesia	Solomon Islands
Guam	Tonga
Kiribati	Tuvalu
Marshall Islands	Vanuatu
Nauru	

Source: World Taekwondo. (n.d.). *Oceania Taekwondo Union*. Retrieved 15 March 2023, from http://www.worldtaekwondo.org/about-wt/cumna.html?ct=04.
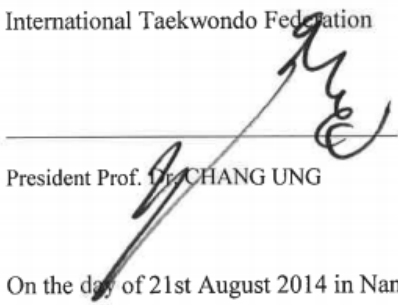
Appendix B: Protocol of Accord Between the ITF and WTF

PROTOCOL OF ACCORD

Acknowledging that the roots of Taekwon-Do are unique and that all Taekwon-Do organizations are to some extent inseparable, the International Taekwondo Federation (hereinafter ITF) and the World Taekwondo Federation (hereinafter WTF) propose to agree to the following principles:

1. ITF and WTF recognize and respect each other as international organizations of Taekwon-Do and provide cooperation and joint efforts in good faith for the further development and prosperity of Taekwon-Do in the world including in the Olympic movement.

2. For purpose of mutual understanding and unity, ITF and WTF will allow competitors and practitioners under their respective federations to participate reciprocally in championships and events to be hosted by both federations, subject to each Federation's rules of competition.

3. ITF and WTF will seek to establish possible opportunities to have ITF competitors participate in Olympic Games as early as Rio 2016.

4. ITF and WTF will form respectively its own Taekwondo demonstration team consisting of multinational practitioners and make the active promotion of Taekwon-Do through the world with their international tour all over the world including southern and northern parts of Korea, the motherland of Taekwondo according to the timing and maturity of the circumstances.

In the name of the
International Taekwondo Federation

President Prof. Dr. CHANG UNG

In the name of the
World Taekwondo Federation

President Dr. CHOUE CHUNGWON

On the day of 21st August 2014 in Nanjing, China

This document is signed under the presence of H.E. Dr. Thomas BACH, IOC President.

Source: https://bstf.org.uk/wp-content/uploads/2016/09/WTF-ITF-Protocol-of-Accord-2014.pdf

Appendix C: Events Conducted at World Level and Sanctioned by World Taekwondo

World Championships

World Taekwondo Team Cup Championships

World Taekwondo Grand Prix

World Taekwondo Grand Slam

World Taekwondo Grand Prix Challenge

World Taekwondo Women's Open Championships

World Taekwondo Open Qualification Tournament for Grand Slam Champions Series

World Para Taekwondo Championships

World Junior Championships

World Cadet Championships

World Taekwondo Beach Championships

World Taekwondo Urban Championships

World Taekwondo Club Championships

World Taekwondo Team Demonstration Championships

World Taekwondo Poomsae Championships

Online World Taekwondo Poomsae Open Challenge

World Taekwondo Festival

World Taekwondo Esports Championships

Olympic Games

Paralympic Games

Youth Olympic Games

Qualification Tournament for Youth Olympic Games

Continental Taekwondo Championships

Universiade (World University Games)

World Military Games

World Martial Arts Masterships

Multisport Games (e.g., Pacific Games)

Source: World Taekwondo. (2022, January). *WT Event Operations Rules – January*

2022. Available from http://www.worldtaekwondo.org/rules-wt/rules.html

Appendix D: Participant Information Sheet

PARTICIPANT INFORMATION SHEET

A model for the delivery of Taekwondo education for officials in the Oceania region

UTS HREC REF NO. ETH17-1287

WHO IS DOING THE RESEARCH?
My name is Rene Leveaux and I am student at UTS. My supervisor is Dr Kyeong Kang, email: Kyeong.Kand@uts.edu.au, telephone +61 2 9514 1912.

WHAT IS THIS RESEARCH ABOUT?
This research is about gaining insight into the Taekwondo experiences of international referees and coaches in the Oceania region as part of a research project to develop a framework for the Taekwondo competition education in the Oceania region.

IF I SAY YES, WHAT WILL IT INVOLVE?
I will invite you to participate in a 30- to 45-minute unstructured interview that will be audio-recorded and transcribed.

ARE THERE ANY RISKS/INCONVENIENCE?
Yes, there are some risks/inconvenience. There is a possible risk that some participants might feel uncomfortable or inconvenienced.

WHY HAVE I BEEN ASKED?
You have been approached because you have experience at the elite level in refereeing and/or coaching in the sport of Taekwondo.

DO I HAVE TO SAY YES?
Participation in this research is voluntary.

WHAT WILL HAPPEN IF I SAY NO?
You are free to refuse to participate or to withdraw from participating in this research at any time without consequences. I will thank you for your time so far and will not contact you about this research again.

IF I SAY YES, CAN I CHANGE MY MIND LATER?
You can change your mind at any time. However, changing your mind after data collection may affect analysis and research outcomes. Please advise as soon as possible of any intention to withdraw. I will thank you for your time so far.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?
If you have concerns about the research that you think I, or my supervisor, can help you with, please feel free to contact me (us) on 02 9514 1892. Additionally, if you wish to confirm my identity or express any concerns, you may contact Mr Stuart Lee, Secretary General, Oceania Taekwondo Union, email: lee.mecca@bigpond.com

NOTE:
This study has been approved by the University of Technology Sydney Human Research Ethics Committee (UTS HREC). If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au, and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

Appendix E: Format of Interviews

30- to 50-minute informal interviews (voice recorded).

Supporting/confirming verbal consent:

Thank you for your time today. Do you agree to being interviewed and have the interview recorded?

Initial open question starting interview:

In relation to your Taekwondo referee (or coach) education, what is the most memorable experience you have had?

As per phenomenology methodology, further prompting questions will unfold, such as:

Can you expand on this notion?

Could you explain what you mean further?

Can you give me an example?

Conclusion of interview:

Thank you for your time. If you have any queries or questions regarding this research, please do not hesitate to contact me or my project supervisors.

Appendix F: Educational and Pre-Event Briefings Observed During the Project

2017

110th International Kyorugi Referee Refresher Course – Auckland, New Zealand

17th Paris Open – Paris, France

2017 New Zealand Open – Auckland, New Zealand

29th World University Summer Games – Taipei, Taiwan

7th Canada Open – Montreal, Canada

2018

123rd International Kyorugi Referee Refresher Course – Bangkok, Thailand

12th Int'l Open Friendship Championships – Itahari, Nepal

25th Captain's Cup – Washington, DC, United States

27th US Open – Las Vegas, United States

4th Oceania Para Taekwondo Championships – Māhina, Tahiti

5th WT Para Kyorugi Seminar – Sydney, Australia

8th Canada Open – Richmond, Canada

8th Oceania Championships – Māhina, Tahiti

2019

15th French Open – Paris, France

28th US Open – Las Vegas, United States

3rd Oceania Presidents Cup – Gold Coast, Australia

5th Oceania Para Taekwondo Championships – Gold Coast, Australia

7th Australian Open – Melbourne, Australia

9th Oceania Championships – Gold Coast, Australia

WT Tokyo 2020 Paralympic Games IR Training Camp – Moscow, Russia

2020

29th US Open – Orlando, United States

2022

12th Online WT International Kyorugi Refresher Course – Online

Belgium Open – Lommel, Belgium

Appendix G: Interview Participants' Narratives

Participant A

Participant A is a senior international referee in kyorugi with over 35 years' experience and holds the highest refereeing classification for that discipline from the world governing body: World Taekwondo S Class International Referee. He has refereed in the Olympic Games, world championships and numerous international competitions. In addition, he has been directly involved in the design and management of refereeing and coaching programs at the national level and previously served in several advisory roles in relation to competition rules and interpretations with both his national body and WT. He holds a senior refereeing position in the global military sporting organisation. He is also recognised as a major contributor to the sport's governing body in his country, where he has held numerous positions on committees and the CEO position. During his tenure as CEO, his country produced several world championship and Olympic medallists and was considered one of the leading countries in Taekwondo. He is an inductee in the Taekwondo Hall of Fame.

Participant A Narrative

While having over 35 years' experience in the sport, Participant A considered his most daunting educational experiences were during the educational/training events for the selection of the international referees leading up to the 2000 Sydney Olympic Games. His involvement in the sport as both a referee and a coach has spanned over 35 years, during which he has attended a broad range of referee and coach educational programs.

The training regime for the international referees for the Sydney 2000 Olympic Games was considerably different and more intense than any previous international referee educational programs. There was a significantly higher expectation of the

international referees by WT as (1) the Sydney 2000 Olympic Games marked the first introduction of Taekwondo as a full medal sport and (2) the sport was being reviewed by the International Olympic Committee. Thus, there was considerable pressure to address and ensure minimal human error, eliminate incorrect decisions, and minimise allegations of cheating or impropriety among match officials.

WT held considerable in-depth training sessions for those referees short-listed for the Sydney Olympics. This included additional training camps to focus on areas where errors may occur. Participant A identified that the training for the Olympic Games was different to normal training. Participant A noted—based on his extensive involvement in the sport—that different countries have different training programs and protocols in place for their respective referees and coaches. This usually consists of an entry-level classification and progressing through various ranking criteria to eventually achieve a level where one would be nominated by their national body to attend the seminars and examinations conducted by WT and become an international referee. Participant A identified that, ideally, progression is attained via 'on-court' experience, acquiring deeper understanding of the competition rules and their application, and participation in domestic camps and educational seminars. The structure of educational programs should be such that they cater for referees and coaches at different levels, and not be programs that provide generic information. The sport is now at a point where there are different core competencies required for the different functions of referees and coaches.

Participant A explained that his national body had procedures in place for referees to gain on-court experience. This commenced with a referee officiating at state-level events, which are qualification events for the country's national championships. He stated that, ideally, a referee would gain some form of feedback during or after a

state competition to assist in the individual's development. This feedback would normally be provided by the referee chairperson for that particular state or a member of that state's referee committee. He stated his country also provides training camps open to referees, coaches and athletes. These camps provide a platform for all participants to gain deeper understanding of the requirements needed for one to be a coach and/or referee at a national level.

At the national level, the national refereeing body provides feedback to referees and coaches in the form of a written or verbal report, and in some cases, videos of their performance. Referees are also evaluated twice at their national championships (at the commencement of the championships and towards the conclusion of a match being used for the referee's assessment), which normally run over a seven-day period. This feedback provides the referees with a chance to immediately address and improve on specific areas of their refereeing, is identified as a formal component of their education process, and is used in their evaluation for future appointments to national competitions.

The evaluation (provided immediately post match) provided to the referees relates to components such as hand signals, ring craft, agility and voice. This allows the referee to immediately focus on areas requiring improvement. Typically, during this debrief, the referee is also placed in situations of self-reflection by being asked questions in relation to specific situations or decisions they made during the match and encouraging discussing of these with their evaluator.

Participant A identified the value of the training camps for coaches, referees and athletes. For coaches, it gave them the opportunity to see how rules would be interpreted and implemented in competition without the fear of their athletes being placed in situations where they might lose an important match. It also gave coaches

opportunities to hone their skills with video replay. For referees, these camps gave individual referees important opportunities to gain on-court match time.

While coaches are not evaluated during these camps, they do have opportunities between match rounds to discuss with the referee the reasons for a specific decision and/or interpretation of a rule(s).

These camps provide a facility for coaches, referees and athletes to gain deeper understanding and knowledge of the sport in a competition-like environment, as well as an opportunity for all stakeholders to gain hands-on experience using the Daedo PSS technology currently used at the world championship level. While this technology is standard use at the national level, not all states in Participant A's country have access to this equipment for their state competitions, trainings and events.

Participant A felt that educational seminars should not be generic. He stated that the current practice, where seminars deliver the same level of information to all participants regardless of experience, needs to be reviewed. He felt that educational seminars should be specific to the core competencies so that different levels of information can be delivered to referees and coaches depending on their experience and not necessarily based on the accreditation level.

Regarding evaluation of participants, Participant A considered that testing should be more interpretive rather than rote, in so much that the content of the written testing should be of how a referee or coach applies a rule(s) to a situation. Similarly, the physical testing should be both specific to the sport regarding testing protocols and involve demonstrating referee or coaching skills in mock situations. Participant A considered that by using such evaluation protocols, the selection of referees for events would be more competency based, in that referees would be appointed for more specific roles.

Education programs for both coaches and referees could have a greater number of components delivered online, allowing the opportunity for a deeper focus on core competencies (depending on the experience of the referee or coach) when attending seminars. Participant A considered the current practice of education delivery to be a misuse of time; the generic components could be more easily delivered online, allowing for educational seminars to be more focused on gaining practical, hands-on experience.

Participant A additionally noted the frequent changes to rules and interpretations due to the continued evolution of the sport to meet spectator and International Olympic Committee expectations. He considered that going online with most of the education would provide a central platform to disseminate such information to all stakeholders as changes occur, enabling stakeholders to keep up to date and not be required to wait to attend an in-person seminar.

Participant B

Participant B is a Taekwondo international referee in two disciplines—kyorugi and poomsae. Through these qualifications, he has officiated in international events in both disciplines internationally and domestically. He is heavily involved in his country's national university Taekwondo programme and currently holds various senior executive positions within the country's national university Taekwondo federation, including board member and referee chair. Participant B is a master instructor in the Taekwondo school at one of his country's leading universities. He currently holds a 6th degree black belt and several other Taekwondo-related qualifications. He has coached and is currently coaching athletes in the university school and within the national university competition structure. Outside of the sport, he is an information technology professional holding a director's position in a global electrical healthcare organisation's Information Technology Information Library and digital transformation team. He

attended one of the leading universities in his country and holds a computing science degree with a sub-major in business.

Participant B Narrative

Participant B stated his most memorable educational experience occurred when he attended the Taekwondo world body's educational seminar to enable him to become an international kyorugi referee. Attending an educational seminar at that level for the first time with other referees from around the world, many of which he met for the first time, increased his personal network in the sport. He found the experience somewhat daunting as he was unsure of what to expect in the seminar. He found the experience unique in that it gave him an opportunity to mix and socialise with people from different educational and cultural backgrounds. He subsequently furthered his education in poomsae competition to become an international poomsae referee. Participant B had earlier recognised that his Taekwondo skills as a competitor were not at the level of major international competitions; however, he found that refereeing at an international level provided a potential path to the Olympic Games.

He stated that one of the main roles in refereeing is to ensure the competition happens the way it is meant to happen and that it is the responsibility of the referees and coaches to ensure and support the integrity and fair conduct of the sport. It is the responsibility of the individual referee to ensure any match is handled in an impartial manner. It is the responsibility of a coach to ensure their athlete has the greatest opportunity to be successful in that contest. This can only be achieved through an impartial and correct application of the contest rules and correct interpretation, as well as the ability of both the coach and referee to respond to any given match situation. To enable this, appropriate and correct educational facilities for coaches and referees must be available and easy to access.

Participant B considered there to be two key factors in the development of suitable education programs for referees and coaches. First, fluency with the rules, their interpretations and the applications of these interpretations. Second, gaining experience through exposure to different situations that occur in a match by actual officiating and/or coaching through different scenarios and working through and understanding what occurs in these scenarios.

While referees and coaches can read and understand the rules, the key factor to success is having a sound understanding of the interpretations of those rules. This is developed through a suitable and accessible educational program that includes visual demonstrations of the application of an interpretation and through deep discussions that officials—both referees and coaches—have with each other regarding individual situations that may occur in a match.

Participant B considered leadership to play an important role in the management of competition matches—one person indicates how a particular rule should be interpreted and how it should be applied universally. This is important because, even if the interpretation is not the most suitable, a single interpretation stated by one person is a platform for consistent interpretations and applications of rules. He considered consistency in rule application to be imperative for both the athlete and coach, and that an athlete should be able to have the same experience in relation to rule application from one tournament to another and from one competition area to another at the one tournament. This can only be achieved if referees and coaches all have the same understanding of the interpretations; this is only achieved through a standard education process.

He felt that even though coaches, referees and athletes follow the same rules, this does not necessarily mean those who attend a tournament come to the debriefing

with the same understanding and expectations. As such, it is important to have one standard interpretation delivered to all stakeholders at any competition.

Currently, there are gaps between referees' and coaches' understandings and interpretations of rules. Participant B has, on many occasions, had coaches inquire with him about how a particular rule is being applied and why. He feels a main reason for this is coaches not being involved in the same conversations referees have when gaining an understanding in and learning the interpretations through various scenarios, both in and outside the educational environment.

Regarding delivery of education, Participant B considered education programs currently still use a 1980s mode of delivery. He stated that education delivery consists mainly of somebody standing in front of a room talking from PowerPoint slides and, depending on the audience and/or location of the seminar, the individual instructor is not necessarily the same for each course. Similarly, PowerPoint presentations are not necessarily standardised and may differ from one presenter to another as they are often prepared by the individual presenter. Neither WT or the regional body provide the instructional materials.

Participant B felt that with the broad range of educational tools and technologies currently available, the delivery of the sport's educational programs should be redeveloped and incorporate more up-to-date technologies. He cited, as an example, the use of multiple video clips to demonstrate scenarios or examples of rules and their interpretations. He noted this is important as an individual rule may have multiple interpretations, depending on the situation. Video clips could easily be taken from real matches and suitable voice-overs applied. He felt such videos could be posted online to allow coaches and referees worldwide to watch and gain a deeper and updated

understanding of how the rules are applied and interpreted. Provision of such materials would narrow the knowledge gap between referees, athletes and coaches.

Participant B considered the use of modern-day technologies to be imperative in the dissemination of course information. He considered that educational programs should be developed by the highest body in the sport possible, whether at the world level or regional level. Ideally, however, the course content should come from the referee chair of WT. The educational programs should be from one source, with one suite of programs delivered across all regions, countries and provincial areas and at the global level.

The educational programs and other training materials should be modular and online. This could, for example, take the form of exemplar video clips. Having this information available online would allow coaches, referees and other stakeholders to access this information and have the most current information on rule interpretations and applications. This would be especially beneficial immediately prior to an event and would reduce the time needed for pre-event referee training and coach debriefing. Additionally, having this information online could allow monitoring to ensure coaches and referees have reviewed information prior to an event. This would help ensure that both coaches and referees, and subsequently the athletes, have the same understandings of the competition rules.

A major problem with education delivery is language; the varying native languages of participants risks gaps in understanding. The use of video clips and other technologies could reduce this risk and would provide a better educational facility than current practices.

Participant B recognises that a sufficiently sophisticated educational package would require considerable resources to develop and, due to the sport continually

evolving, would require continual management of the educational resources to ensure they are up to date.

Ideally, the educational program would be developed such that it is applicable both to coaches and referees. The educational program should be designed to be accessible to all, as opposed to current offerings. Currently, seminars are at set times and set locations, which may not be suitable or feasible for an individual (schedule conflicts, travel costs, etc.). This effectively restricts individual coaches and referees from attending.

Participant B suggested that state-of-the-art technologies be used (e.g., educational content management software such as Panopto) and the educational program be made available through a suitable web platform.

Participant C

Participant C is an international kyorugi referee and holds national poomsae referee accreditation. As an international kyorugi referee, she has officiated in numerous international events, including world championships and Olympic qualification tournaments. Participant C is also a qualified national coach and has coached athletes at domestic and international competitions. She and her husband own their own dojang, where she instructs several evenings during the week and on weekends. She and her husband hold executive positions in both their regional and national bodies. She is a member of her country's national referee committee. The sport plays an integral role in her family; all family members actively participate in the martial art. She has given invited presentations at referee seminars domestically and in other countries. She also has full-time employment in an aged care medical facility.

Participant C Narrative

Participant C considered her most memorable Taekwondo experience to be when she officiated as a kyorugi referee at her first world junior championships. This was also her first event as an international referee. A challenge was that it was the first-time implementation of some substantial rule changes and, further, athletes were required to wear a new version of the competition headgear, which included a full-face shield. For many athletes, this was their first time wearing the new head gear.

During the training days immediately prior to the competition, the referees were advised that they, for the first time, would have access to video technology to ensure the correctness of a decision regarding the scoring of a head kick. Previously, only coaches could challenge, via video review request, for a head kick score. While having some prior knowledge regarding the headgear, referees and coaches had not been educated, either prior to the event or during the pre-event referee training or coaches meeting, on the changes to the video technology for referees. She additionally noted that some variations to the rules had to be applied for the safety of the athletes regarding the new style of headgear, even during these championships.

Participant C considered that the training days immediately prior to an event could be managed better, as there was a considerable amount of downtime during those days. She stated that a significant amount of time was spent trying to get to educational or training spaces. In addition, many downtime periods were due to the referee chair being required to attend to other matters and meetings, and so being taken away from the pre-competition instruction. She also noted the potential for interruptions to training sessions due to unscheduled visits by senior members or dignitaries. These pre-event training sessions could be far more effective if they were well planned. She felt the time would be better spent on discussion and instruction on exemplar situations taken from

previous events, demonstrated via video clips from actual previous matches. The clips could be linked to other technologies (e.g., iPads) to give the referees a practical example of those situations prior to the start of the competition. Such video clips being available through a suitable learning platform would provide a facility to allow for greater consistency across referees—at that event and globally.

Coaches and referees must continually educate themselves as the sport changes, especially on the rules and their application. Participant C attends educational seminars run by WT at least biannually and officiates at as many international events as her finances and available time allow.

She indicated that the current educational model for coaches and/or referees at the international level is very costly; in most cases, the individual referee and/or coach is required to self-fund their attendance at educational seminars and competitions. She felt the referees and coaches in her country were somewhat more fortunate than those in other countries, as her national referee chair attends a large number of international events and seminars conducted by WT and passes on relevant information to each of the provincial chairs. However, in some provinces, the provincial referee chair does not disseminate the information any further.

In addition to costs, Participant C cited geographical issues. There is a considerable imbalance between the different regions in regard to international events and, to a lesser extent, educational programs. The demographics tend to decide where events and education programs are held; this makes attendance impossible for some due to considerable travel distance, time away from family and work, and the costs of international flights and accommodation. She felt these issues could be lessened by making educational resources available online.

Participant C stated that, as she comes from a bilingual country, the national refereeing and coaching seminars—and even some pre-event debriefs—are conducted with a translator, who is on site to explain course content in the alternative language when necessary. Additionally, when questions are asked, both the questions and responses go through the interpreter. At her regional level, seminars are delivered in English, despite some presenters and attendees not being native English speakers; in some instances, this causes misunderstandings.

While WT conducts seminars in different regions, there is no requirement that participants be from that region; as such, seminars are attended by participants from multiple countries and language backgrounds (especially in the case of multilingual countries). There are often subsets of participants who attempt to translate the seminar content into their native language.

She noted that WT's official competition rules and regulations are written in Korean and English, while the official language of the sport is English. Other international referees and coaches proficient in English and Korean have stated that the translation from Korean to English is not always accurate. In countries where English is not the native language, the rules and regulations are translated into the local language, usually by an international referee from that country; this creates the potential for inaccuracies in translation.

Participant C stated that when she first commenced the sport, she felt there was a 'blockage' in the distribution of information; that is, it appeared that only certain information was being provided to a select group of people. As the sport has evolved internationally and as an Olympic sport, there is greater expectation of transparency. As the sport continues to evolve, there is a greater need for open dissemination of the competition rules and their interpretation and application. These are continually

changing, and so it is necessary for referees and coaches to remain up to date to enable a consistent and fair competition environment. Technology plays an integral role in the provision of this information. Online and up-to-date course materials enable coaches and referees to be better prepared prior to an event or a seminar. Participant C noted a particular challenge for referees is gaining actual hands-on competition experience due to the financial costs associated with travelling to international events. She expected this issue would persist despite online educational offerings.

Participant D

Participant D is a world-recognised international coach who has coached national teams at world championships and Olympic events. He has coached in several countries and three regions. He has delivered numerous coaching seminars worldwide, including in the member countries within his region. Prior to coaching, Participant D was an athlete and competed domestically and internationally. He has tertiary qualifications in business, which he uses in his full-time employment and in his part-time role in the regional body. In his role in the regional body, he liaises directly with the executive council members of various national bodies within his region and with different departments of WT on matters relating to the education and accreditation of coaches and referees. Participant D is an accredited international coach and holds coaching qualifications with his regional body. He is also an instructor with WT for coaching accreditation courses.

Participant D Narrative

Participant D considered his most memorable education experience, either as a coach or referee, to be when he attended the first educational seminar conducted by the European Taekwondo Union. The seminar was attended by approximately 100 people, mainly coaches and referees from across the European region. The instructor for the

seminar was the European region's referee chairperson, who at that time was also the chairperson for WT's referee committee. Participate D found the seminar to be of great benefit, as it was the first time coaches in this region had opportunities to openly discuss rules and their interpretations with refereeing officials, coaches and other stakeholders. In addition, the seminar provided an opportunity for the sport's stakeholders to gain deeper understandings and insights into the interpretations of the rules, which he felt could not be achieved just by reading the rules and regulations.

This seminar also provided a forum for him and other coaches to network and gain greater insights into various aspects of coaching and differing viewpoints about playing the sport from the other elite-level coaches in attendance.

Participant D also volunteered his most memorable *negative* experience. This occurred during a national accreditation scheme program, where he felt he was unfairly targeted by the course presenter with unjust criticism of his coaching methods.

As an elite-level coach, he felt it important that educational programs provide opportunities for coaches to gain the same understandings and interpretations provided to referees. He also considered the educational programs to be a forum in which coaches could discuss and analyse situations with referees in a non-threatening environment.

Participant D found the conversations in seminars to be more beneficial in an open forum environment. This allowed constructive discussion on situations in which a particular interpretation of a rule would be applied. He noted that dissemination of information from the elite-level seminars down to club-level coaches was very dependent on the personal and professional relationships across the communication chains and coaching levels in a country. The presence of regional- and local-level sports politics also affected this. To minimise such interference and ensure the same

information is being disseminated to all levels, the same educational facility must be readily available to all stakeholders.

The nature of the sport (physically risky) and its continual change makes it imperative for coaches to do their job correctly. They need to be inquisitive and seek advice to ensure they stay up to date. However, this is expensive in terms of time and money, and local sports politics may prohibit a person from attending a relevant educational seminar. Participant D considered the provision of an educational portal readily accessible by all stakeholders to be the starting point in addressing this. Such an educational facility should contain components that guide participants through the rules and regulations and be supported by videos depicting applications of the rules. Additionally, this educational platform could go a step further by providing a facility for one-on-one discussions with an instructor (where appropriate), suitably qualified international referees and international coaches.

While an online educational platform could address a majority of the problems, this relies on the availability of internet and the stability of telecommunication services within a country and region. He considered this to be a greater problem within the Oceania region compared to other regions. To overcome this, an instructor may need to deliver a seminar in person, or have the seminar made available via another medium, such as a thumb drive playable on a domestic device(s). While not ideal, this would provide access to the same content available online.

Participant D reflected on his own experiences, as an international coach, in having to seek the necessary information from multiple sources to fulfil his role. He felt that one centralised, authoritative source would be of great benefit and save considerable time. He felt that educational programs should contain information relating to the competition rules/coaching *and* areas related to athlete preparation outside of

competition (e.g., strength and conditioning, periodisation, diet and recovery, and financial and managerial components such as athlete registration/accreditation and gaining sponsorship).

Participant E

Participant E has international referee accreditations in kyorugi and poomsae. She has officiated in numerous international poomsae and kyorugi events at all levels up to and including world championships (with several commendations for best referee). She participates in the sport for exercise and her love of the sport. Her participation is restricted to times when her work life permits. Participant E holds a doctorate in engineering and two masters degrees, including a Masters of Business Administration. She is the CEO and principal consultant of a multinational organisation operating primarily in the areas of pharmaceuticals and medical devices. She has also held academic roles in the tertiary sector.

Participant E Narrative

Participant E reported many memorable experiences in the sport, including officiating as an international referee at several major international tournaments. Her most memorable experience was attending an Olympic selection camp for international referees. International referees must be invited by WT to attend Olympic selection camps, as opposed to no restrictions on attending WT's refresher camps or seminars. She felt the Olympic camp was an eye-opening experience that gave her a greater insight into what was required of a referee to officiate at the highest level.

Having attended numerous international referee refresher courses conducted by WT, Participant E was adamant that educational seminars should be tailored to allow more experienced referees to work on and analyse situations that have occurred in the past three or so major international events. Current practice is that all international

referees, regardless of experience and knowledge, attend the same course or seminar. She noted that experienced international referees gain deep understandings of the rules and regulations and their interpretations through both on-court experiences at major international events and pre-event educational meetings. The mandatory pre-event educational meetings for referees at major international events usually run over three or four days. She felt the financial costs and time involved in referring at a major international event, borne by the individual international referee, could be reduced by the general revising of the rules and their applications being done online prior to the event. This would also reduce the time required for the pre-event seminar.

Participant E felt existing educational program delivery modes to be somewhat obsolete and repetitive. Instead of the one generic educational program, she felt the program should be tailored towards both referees and coaches at different levels of experience. She felt there should be a standardised, entry-level seminar for those commencing at the international level, while experienced referees and coaches should receive elite-level seminars containing more technical or higher level instruction and analysis and discussion of situations that have occurred in past major events, especially unique situations. The educational programs (especially pre-event practical training) should be designed to incorporate past situations and outcomes, rather than created situations (some of which are unrealistic and unlikely to occur in a competition match). The outputs of this elite-level analysis could then be incorporated into the standard educational program (as exemplar situations for pre-competition training) and the more generic educational programs. This would change the current theoretical education programs into more practical and practice-based programs. Additionally, the educational programs should be standardised across all regions and countries.

Identifying referees and coaches as experienced or not would be based on their history of officiating in various tournaments. Time would not necessarily be considered an indicator, as some referees and coaches only officiate at one or two events a year. Conversely, some, especially on the European and Pan American circuits, officiate at two or more events per month. Those referees and coaches would be considered to be experienced and up to date, having also attended the pre-event training and debriefings.

The seminars and educational courses for experienced referees and coaches would differ in content and structure from the standard courses; elite-level educational courses would involve brainstorming and developing solutions to situations drawn from recent elite-level events and ensuring the solution complies with the competition rules and regulations. These elite-level seminars may consist of a brief component of updating participants on any recent rule and interpretation changes, then focusing on the practical side of the application of these interpretations to various situations, perhaps with live simulation matches with athletes in a staged competition-like environment. This would also enable referees and coaches to practise and work on their reactions in real time. Participant E also suggested that analysis of situations from live matches could allow the development of physical and mental exercises as training tools for both coaches and referees.

Participant E also identified the necessity of being able to readily access updated rules, regulations and their interpretations due to the continual changing of the sport. She identified various inhibitors currently preventing coaches and referees from being able to attend as many events and educational seminars as they would wish. These inhibitors include costs, time and location/travel distance. To address this, the educational programs should be readily available online, accessible to all relevant stakeholders and updated as necessary. The programs should have exemplar videos of

situations showing various rule applications taken from recent major international events.

Participant E stated that it was important that the same educational programs be offered to both coaches and referees. Ideally, coaches and referees would attend or participate in the same educational offering, allowing for discussions to consider the perspectives of referees and coaches. This would further improve the synergy and interactions between referees and coaches, as both parties would have the same level of understanding of what is permissible and not permissible.

Participant F

Participant F is an international and national referee in kyorugi and poomsae. He owns his own dojang and manages and instructs in Taekwondo and three other martial arts. He is a member of his national body and has held several committee positions. He commenced training in Taekwondo when at university, approximately 35 years ago. He has a black belt in Taekwondo and similar/equivalent gradings in the three other martial arts he teaches. He has tertiary qualifications in information technology and is the information technology manager at a local boys high school.

Participant F Narrative

Participant F recalled his most memorable experience to be his first international referee seminar conducted by World Taekwondo. The course was conducted outside his country and presented by the referee chairman of WT at the time. The presenter was fluent in several languages, despite not being an English native speaker. Participant F considered the presentation skill of the instructor to be crucial in the delivery of course content and management of course participants.

He found the course to be somewhat more practical based rather than theory based, which he retrospectively agreed to be necessary and beneficial. The practical

focus provided sound knowledge and allowed appreciation of real situations and scenarios portrayed during the course. Participant F stressed the need for participants to have a certain minimum level of knowledge prior to attending such an elite-level seminar. He considered this to be paramount, to ensure the course is delivered to experienced practitioners who can understand and benefit the most from such instruction. Conversely, he stated that delivering the seminars in a way that suits those who may only be attending for accreditation and lack prior knowledge lowers the quality and value of the seminars. He felt that educational courses should include a pre-screening via an internet-based assessment, to ensure participants have a necessary base knowledge.

He emphasised the need for practical experience and that educational programs need to be tailored to offer practical knowledge rather that the rote learning of rules and regulations. Practical experience could be gained through potential course participants participating in local events and tournaments to gain confidence in officiating, either as a referee or coach, and acquire hands-on skills.

Participant F considered it more important to select the best person(s) suitable to present/instruct in educational seminars rather than adhering to the martial arts ranking system. This may require a culture shift in the sport. He noted that suitable educators might not necessarily be of a high martial arts ranking.

He considered that the majority of educational content, testing and pre-course screening and processing could be delivered online. He felt that the majority of face-to-face educational sessions should be delivered in one location for each region, selected to reduce regional participants' travel costs and the costs of running the course. For the Oceania region, he suggested the Australian Institute of Sport, though this facility is not in his country.

While the majority of course materials can be delivered online, he felt that every competition event should have a face-to-face briefing session for both coaches and referees, to ensure all parties have the same understanding of the rules and especially their interpretation and application. This briefing session could be as short as one hour for regional events, two to three hours for national-level events, and four to six hours for international-level events.

Participant F considered it important that course materials and assessments are standardised and that course materials are practical based. He felt that the assessment of participants (written and physical/match testing) should be practical based and specific to the sport.

Participant G

Participant G is a senior national referee in kyorugi and an international referee in poomsae. She is also a coach at the club and regional levels in her country. She assists in instructing students in the club where she is a member. She and all her family are Taekwondo practitioners. She is employed outside of the sport; she participates in the sport for enjoyment and fitness, not as a source of income.

Participant G Narrative

Participant G has attended seminars and courses for kyorugi and poomsae domestically and internationally. She prefers competition poomsae rather than the sparring of kyorugi. Her most memorable experience was attending a three-day workshop on poomsae. This course was conducted locally, but the instructor was flown in from another country within the region. The instructor was very familiar with the requirements of competition poomsae, being an international referee in poomsae and having previously competed internationally in poomsae.

Participant G found the delivery of this particular course to stand out compared to other courses she has attended due to the way the course was structured. The course was broken down into small manageable sections and involved discussion surrounding the theory within each section. The course focused specifically on competition and judging components in competition. The medium of delivery was a combination of PowerPoint presentations blended with practical sections where participants partook in hands-on course components. She felt this structure enabled the learning of the relevant poomsae knowledge under the tutelage of a suitably qualified instructor, and that the instruction was to a competency level expected in poomsae competition.

Participant G found the mode of delivery to be very suitable. She felt that having human interaction is important, with an instructor present to demonstrate the poomsae and provide hands-on tutelage. Additionally, this allows for immediate feedback and correction. She also felt that having an instructor/presenter who is very knowledgeable in the sport—including able to provide examples and detailed instruction of how a particular poomsae form needs to be performed and judged in competition—to be imperative.

In addressing availability, Participant G expressed the need for more educational facilities to be made available in her country and region. She expressed frustration with the lack of direction, planning and communication by her national body, which affected the provision of educational courses. She also felt the mandatory three-day seminars should be replaced with a series of shorter one-day workshops that specifically focus on specific components of the sport.

In relation to a course instructor, Participant G felt it would be appropriate to have one person deliver all courses within a country and, if possible, a region. The instructor should, as a minimum, have an international referee qualification; this would

ensure a necessary level of experience to satisfactorily deliver these courses. This would be the standard for kyorugi and poomsae courses. In situations where it is not practical or logistically possible to have a single instructor, courses could be delivered online. However, she raised concerns regarding the provision of immediate feedback and question resolution when delivering courses online.

The examination or assessment of participants' understanding and application of theory following a course could consist of an online written test. However, the practical component of the assessment would need to be carried out in a face-to-face format. Additionally, participants need to be provided with suitable feedback following the completion of the course. Participant G considered that all courses should be standardised in structure, content and content delivery, and that progression in the refereeing or coaching ranks should follow active participation in the sport to gain the necessary experience. She felt that feedback both during and following a course is extremely important. She noted that, at present, feedback following the completion of a course is minimal and usually limited to telling the participant whether they passed or failed.

Participant H

Participant H is an international coach and international referee in poomsae and kyorugi. All his international accreditations have been certified by World Taekwondo. He has officiated as an international referee in world championships for poomsae and kyorugi and has coached at international competitions. Participant H owns his own dojang and instructs in Taekwondo as his primary source of income. He is an active participant with his national body, in which he has held and currently holds various committee positions, and holds senior positions with various other Taekwondo bodies and organisations in his country, including chairman and technical director. He also

delivers poomsae referee courses in his country. He has tertiary qualifications in business, which he uses in the operation of his dojang and in his Taekwondo-related roles.

Participant H Narrative

Participant H, based on his deep involvement in the sport and numerous experiences as an official in competitions around the world, considered the sport to be an opportunity to see and experience different cultures and an avenue for people to improve their life skills. He noted this especially for the younger generation, in that the sport develops self-confidence, respect, courtesy and perseverance. He felt that the sport's educational programs provided him with opportunities to improve his refereeing skills; importantly, they provided updates on the latest rules and their interpretations in kyorugi and poomsae. He noted that the educational programs (1) provide the necessary educational pathways for younger referees and coaches to develop and improve their individual skills and (2) serve as a platform for experienced coaches and referees to share their experiences. This, in turn, improves the sport of Taekwondo.

He considered WT's current number of seminar and educational program offerings to be somewhat adequate. However, he considered this could be improved by having more course instructors available, especially if this enabled programs to be delivered locally. He suggested that the senior referees in each country could be educated by World Taekwondo as course instructors and then disseminate the information to referees and coaches in their country.

Participant H considered online delivery of course materials to be effective. Delivery or circulation of update CDs could also support online learning; referees and coaches could review and study new rules and processes of refereeing and management of matches in their own time.

He also felt that feedback is an important factor in the educational process and should be bi-directional—feedback should be given to participants, and participants should provide feedback to the instructors and those who manage the educational courses and programs. Feedback could be provided via an online forum and/or email through relevant links or attachments. Participant H also felt WT could use focus groups to evaluate courses and their structures. This constructive feedback would enable improvements to referee and coach education programs (content, structure, frequency, desired feedback for participants, etc.). He felt that the current level of feedback being provided to participants and course instructors was exceptionally poor; in most accreditation examinations, for example, participants are simply informed whether they have passed or failed.

Participant H felt it was necessity for courses to have specific content for specific referees at specific levels. For example, senior referees whose normal function is primarily centre referee could have course components specifically focused on activities surrounding the roles of a centre referee (e.g., ring management). Other referees who may primarily do corner judging could have course components specifically on corner judging. In addition, Participant H considered the courses should address other surrounding matters in relation to coaching and refereeing, such as the wellbeing of officials, multitasking and other mental aspects of the sport. He also considered it important that courses teach sport officials how to be effective in the roles they take on when officiating in the sport (referee, coach and/or general management of the competition).

Participant H considered it important that the world, regional or national bodies appointing referees for an event should select sufficient numbers of suitably experienced referees based on the competition level. For example, at a world

championship, a high percentage of highly experienced senior referees would be selected; at lesser ranked international events, less senior experienced referees and more junior international referees may be selected, with the latter using these events to gain experience while being mentored by the senior referees. This would also apply to coaching. This would provide additional educational opportunities for novice international referees.

In general, Participant H considered that the overall educational process for both referees and coaches extends beyond simply attending educational courses. Their development also involves gaining experiences through interactions with other stakeholders and mentors in the sport and hands-on experience in officiating in competitions.

Participant I

Participate I is an international referee in poomsae and kyorugi, with her qualifications certified by World Taekwondo. She has officiated in international competitions for poomsae and kyorugi. She is an active committee member of her national referee board and chairperson of her regional referee committee. She has previously held other positions with her regional and national body. Participant I instructs in Taekwondo at her local club for competitive and non-competitive practitioners. She also provides instruction and mentoring on refereeing in poomsae and kyorugi to regional referees and runs the national referee accreditation courses for her region. She has full-time employment working in a psychiatric facility. She has tertiary qualifications in psychiatric patient management.

Participant I Narrative

Participant I has attended and delivered numerous referee and coaching courses within her country. Her most memorable experience was her first international referee

course in Rome due to the expected refereeing level and experience of participants and the presence of high-level/senior attendees from various countries.

Her Taekwondo instructor (a senior international referee) acted as her mentor during this course, providing her with assistance and guidance. She found the course strengthened her understanding of the rules, regulations and their application and challenged her understandings through discussions and questions. Her mentor provided additional guidance on components of ring craft, such as hand signals and match management.

Participant I considered referees and coaches' biggest challenge to be staying up to date with the latest rules, regulations and their interpretation. This knowledge is necessary for officials to have confidence during a match. She stated that the frequent rule and interpretation changes make it very difficult for coaches and referees to be up to date on these. She considered that while course cost is not excessive, the costs to attend a course (travel and accommodation) often make it prohibitively expensive. Further, the frequent rule and interpretation changes mean more attendance of course and, thus, more expense.

While the dissemination of information on changes occurs reasonably well within her country, Participate I noted some friction points—information being blocked from dissemination and persons not forwarding on or sharing information. She also felt it was extremely important to distribute the rule changes *and* the new applications and interpretations, ideally with examples of circumstances in which the changes would be applied.

She considered the mechanisms and mediums by which this information is distributed to be equally important. Online distribution of updated information and clips of live matches depicting applications of the interpretations would make these readily

available. Online facilities could also provide discussion surrounding rule changes. She felt this would be of great benefit and enable a more common understanding of interpretations and applications.

Such online distribution could easily be used to facilitate the pre-competition training normally held on the days prior to competition. While this would require an additional day at the commencement of a competition, Participant I considered the benefits would be justified by ensuring all stakeholders have the same understanding. The structure for pre-competition training sessions would consist of one to two hours of reviewing rules, then practising application of the rules in a range of scenarios. Participant I also considered the team-building benefits of such activity for all stakeholder groups. The practice scenarios would also provide learning tools and examples for subsequent courses and workshops, providing starting points for group discussions of the application of a particular rule.

Participant I considered it crucial that course participants be tested by demonstrating the skills acquired during a course or seminar in a competition-like environment. While rote learning of the rules and regulations and correct answers to situational questions have their place, Participant I felt the final test to demonstrate actual understanding is real-life application in the ring. Ring craft skills could be developed through practise in competition-like environments such as team training sessions or practice match environments. This has the added advantage of giving referees, coaches and athletes exposure to new interpretations in a less critical environment than competition.

Participant I considered feedback to play a very important role in the development of referees and that feedback should be provided at all levels and at all times—including during courses, competition and training sessions. This feedback

could be built into the processes for assessing course candidates. She considered this especially relevant for those attempting to qualify for or maintain accreditation for the sport.

Participant I stated the importance of standardising course content and delivery, especially when there are multiple course presenters. Regarding content, competition rules should be articulated, but the focus should be on the purpose and interpretation of the rules. This provides a platform for uniform interpretations and sound match management. She felt this approach should start at the grassroots level and be built up from there.

Participant I stated the potential benefit of providing additional materials to coaches and referees for personal development (e.g., content on people management, stress management, teamwork). Participate I considered enjoyment of courses to be an important factor, given that the majority of coaches and referees participate in the sport for enjoyment, not financial gain, and self-fund their education in the sport.

A key component of course delivery is the course presenter. Participant I felt it is imperative that the course presenter have a deep ('passionate') understanding of the rules and regulations and the desire to deliver and teach people the rules and regulations. Course presenters also need to have people management skills. Courses must be delivered such that attendees gain a deep understanding of the course materials *and* the ability to apply them effectively. If in-person presentation is not feasible, courses can be delivered online; however, online delivery needs to be structured to provide the facility for discussion and immediate feedback via the presenter during the delivery of the course (including constructive feedback on an individual's assessment and performance).

Participant J

Participate J is a national, regional and international referee in kyorugi. He is currently the vice chairperson for his region's referee committee and regional education manager. In the latter role, his responsibilities include the delivery of Taekwondo referee and coaching programs for his region and any accreditation of referees and coaches within the region. He is an accredited instructor for refereeing and coaching accreditation courses with both WT and his regional body. He has delivered instruction on Taekwondo on behalf of World Taekwondo to several countries within his region. He has been involved in the appointment of international referees for international competitions in his region. He is currently employed in the tertiary education sector in his province. Prior to this, he held a middle management position in an international technology hardware company.

Participant J Narrative

Participant J, based on his considerable involvement in the delivery of educational programs to referees and coaches within his region, was able to provide deep insight into the problems and issues being experienced by all stakeholders, including course presenters. In addition, he identified current shortfalls in educational programs and education and accreditation matters external to WT's education program.

Participant J considered there to be two areas in which the current education system at the global level is lacking. His region was attempting to address both. First, and arguably the more important issue, is the lack of feedback provided by WT to course participants. Second, the lack of input sought from WT by regional bodies in relation to educational programs and the rules and their interpretations.

While his region encourages feedback, the current structure, delivery modes and time constraints of courses limit opportunities for feedback in educational seminars and

pre-event training and meetings. Further, the varying experience levels of participants make it difficult to calibrate the depth of feedback.

Educational programs are currently standardised to deliver the same level of instruction to all participants; thus, for experienced coaches and referees, the educational programs are wanting in detail and depth. Yet, providing such detail would likely confuse inexperienced participants and be of little benefit to them. Therefore, Participant J stated the need to revise the current educational program structure to allow for greater flexibility and accommodate differing levels of expertise among participants.

Participate J considered a key component currently missing in the educational offerings at the state, national and international levels is the provision of a communication pathway. This applies to the dissemination of both general information relating to both coaches and referees and information related to competition, competition rules and current interpretations. Currently, there is no formal mode or mechanism for coaches and referees to obtain up-to-date information on the rules and their interpretations. This information is only provided in seminars and pre-competition briefs. In addition, there is no structure to allow for input from coaches and referees regarding course content and structure.

The existing course structures and offerings are rigid and provide minimal flexibility. Participants are currently required to attend accreditation seminars, often involving international travel and considerable expense (flights, accommodation, meals and course fees). These expenses prohibit many international referees and coaches from attending, especially those from lower socio-economic countries in his region.

Participant J considered technology to have an important role in the provision of education and addressing the abovementioned communication issues areas in in which communication was lacking. Technology should be integrated into the educational

programs to provide facilities for all stakeholders to access the most current and up-to-date information.

He considered that given the current uses and applications of technology in the sport and in competition, the educational programs should include training on these technologies, such as the video review technology and PSS. Currently, there is little educational material provided on these, and most education and training for these systems is done immediately prior to a competition or via 'on-the-job' training.

There is demand for a new style of delivery for coach and referee education where participants can access live links associated with relevant questions and articles. Such a facility could be made available for a course participant to do pre-course training, thus minimising the time required for in-person attendance.

The online education facilities should complement the descriptions of rules and their interpretations with scenario-based videos. This would allow face-to-face sessions to be more focused on practical components of coaching and refereeing, rather than time spent listening to a PowerPoint presentation. Seminar participants would be more focused as they would be participating more directly through practical components such as simulation, engaging in discussion groups, and having opportunities to gain live feedback on various matters (individual match questions, competition and competition preparation, etc.). Participant J considered that seminars would then evolve into workshops attracting both experienced and novice international referees and coaches.

While coaching accreditation and refereeing accreditation are separate, Participant J felt there to be great benefits in having the seminars attended by both referees and coaches together rather than separate seminars. Having referees and coaches attend the same seminar better ensures the same understandings of the rules and their interpretations and application. He noted that current course structures allow for

varied rule interpretations, as they are modified to suit local environments or outdated; this leads to confusion when referees, coaches and athletes participate at different levels. Problems arise when participants for a representative team are selected using one set of interpretations and then go to contest matches officiated under newer, slightly different interpretations. Participant J felt that one educational model (including content) should be standardised across the region. Ideally, the model would be disseminated by WT to each region, then delivery managed by the respective region.

He considered the success of an educational program to hinge on having experienced presenters who are fully conversant with the educational program and have a deep understanding of the competition structures, competition rules and the application of those rules. Course presenters should come from a pool of presenters within the region who have all been educated and accredited via the same program. Such a program should be specifically designed for all the presenters globally, to ensure standardisation in the delivery of educational programs and minimise any confusion and misinterpretations.

In the (re)development of an appropriate educational program, Participant J considered the provision of a suitable feedback mechanism to be essential. This feedback mechanism should be both suitable and available for use in and across all the different countries within the region. In general, there is a distinct lack of formal communication between the regional chairpersons. This extends to the area of coach and referee education. This has led to different countries and regions having their own educational program; thus, different versions of rules and interpretations are being delivered by different regional bodies.

He considered that a standardised program would address the current discrepancies in instruction. This would ensure common understanding among referees,

coaches and other stakeholders. He considered it to be very important to provide examples and articles demonstrating the practical components of the sport and officiating rather than just providing theory.

He suggested that when an individual coach and/or referee registers to attend an education program, the registration form should contain links to the theory and rules behind competition, along with video examples. This would enable participants to be better prepared at the commencement of an educational seminar. He considered that a participant would need to register one month prior to the seminar, to provide ample time for the participant to review the pre-course materials. In doing this, the seminar could be activity-based education rather than the existing 'stand-and-deliver' mode currently being used in face-to-face and video delivery. He felt this would enhance learning and minimise misinterpretations or misunderstanding of the rules, their interpretations and application. This, coupled with simulation matches, would accommodate differing levels of coaches and referees attending seminars and allow participants to gain hands-on experience.

While courses would ideally be face to face, tools such as Facetime or any application that enables remote interaction could be used when in-person courses are not practical. It is important that there is a facility for interaction to enable live demonstrations and/or explanations and to encourage open discussion. The design of the course and its delivery should have facilities for feedback both during the course and following the course. The current process of feedback in his region is via a form at the completion of a course or seminar. However, providing feedback during a course allows for better understanding of the rules, any misunderstandings to be addressed and corrected immediately, and that information to be shared among all attendees. This aids in uniform understanding.

Participant J felt there needs to be better communication and involvement between WT and the respective continental unions in relation to education. Currently, there is no input from the respective regional referee committees or committee chairs on competition rules and matters related to competition, and some of the regions have no representation on the respective competition committees of WT. Education programs should come from a single source, with input from the continental or regional bodies. Standardisation means courses should be the same content delivered with the same materials, costs and structures, thereby enabling a common understanding worldwide.

Participant K

Participate K is an international referee and international coach in kyorugi. Prior to coaching and refereeing, she was an athlete who competed at the regional, national and international levels. She has officiated in international competitions, including Olympic qualification and world championship events. She has been involved in the sport for over 30 years and is currently the chairperson of her national referee committee. She has coached athletes competing in international tournaments and club-, domestic- and provincial-level events. She does not participate in the sport for a source of income. She occasionally assists in instructing Taekwondo students at the dojang where she trains. Participant K has full-time employment in a middle-level managerial role for an international logistics company. She is the only member of her family who participates in the sport. International sport engagements and her work see her being away from her family for extended periods.

Participant K Narrative

Participant K, having been a competitor, coach and international referee at the elite/international level and intimately involved in competition management at the club,

national and regional levels, provided deep insights into the educational requirements from the perspectives of all major stakeholders in Taekwondo competition.

Participant K considered her participation in the Olympic selection process, especially the Olympic training camp, to be her most memorable experience. Some additional educational materials and facilities were provided at these camps. The application of scoring technologies, having the facility to score video clips using the judge's scoring devices, and receiving immediate feedback were considered immensely beneficial. The feedback provided the speed in which a referee scored the point and the individual score achieved by the referee.

Participant K considered the practise on this technology and how it was used for training provided referees with a greater crossover from instruction to actual matches (i.e., more practical training readily translatable to real-world, elite-level matches). She felt this increased the relevance of the referee instruction as compared to the normal educational process. In standard seminars, referees are provided with instructional documentation that gives basic instructions on how the scoring devices work and how to register scores on the device—that is, they receive no actual hands-on experience until actually officiating in a match. This also risked different interpretations of the instruction documents. Conversely, actual hands-on use of the device in a training/educational environment allowed any misunderstandings to be addressed and the experience shared among participants. This also enabled a common understanding of using the technology. Real-time feedback additionally minimalised the risk of a participant learning, developing or self-reinforcing incorrect applications of rule interpretations or use of the device. Any incorrect application or use was immediately addressed and corrected.

Participant K considered the application of video clips of actual situations to be an important part of the education process. These videos can include previous situations where rules were correctly and/or incorrectly applied. Clips of incorrect applications of rules and their interpretations allow for education to referees and coaches on how to address similar situations, rather than finding out via an infraction occurring during an event.

Online delivery could also be used for pre-event required reading prior to attending an educational seminar, or for a referee to review when appointed to officiate at an event and for coaches to review prior to coaching at an event. Participant K considered this would free up lead-up days for coaches and referees to focus on specific areas, rather than reviewing in-depth rules that all parties should be familiar with.

Modules should be designed so that individuals can focus more on areas in which they are or consider themselves to be weak. The application of such a model should not be exclusively available to referees but could and should be readily available to coaches and athletes. This would provide coaches and athletes with a platform to observe correct applications of rules and current interpretations. This would aid cleaner competition, with participants having the required knowledge prior to the event, rather than learning on the day. Participant K recalled many occasions of coaches and athletes becoming extremely frustrated upon a referee correctly applying rule interpretations that the coach is unaware of. Participant K noted a disconnect between coaches and referees in relation to understandings of current rules and applications. This is due to the difficulties in obtaining up-to-date information, continual changing of rules and interpretations, and separate educational programs for coaches and referees.

Participant K noted that the competition rules and interpretations change frequently. The only avenue for gaining up-to-date information is attending a seminar or

an event. Information is not communicated, formally or informally, to stakeholders in any other way. This makes it difficult for stakeholders to remain abreast of the current rules and interpretations. It is also demotivational, as attending update seminars entails time and financial costs often borne by participants. It is, in essence, the responsibility of a stakeholder to continually check with WT for educational seminars to attend so as to remain up to date and, for referees, eligible for appointment to international events. Currently, there is no mechanism by which updated competition information is pushed to stakeholders, nor is there a mechanism for the dissemination of such information from WT to regions, regions to countries, and countries to individuals.

Essentially, the only mechanism to keep up to date without attending a seminar is by word of mouth from someone who has participated in either an educational program or a major international event sanctioned by WT. Further, this information is usually only disseminated for those in specific refereeing and/or coaching circles and has been referred to as 'unofficial' by the chairs of the relevant committees of WT.

Participant K considered there are existing mechanisms, via social media, by which valid information could be disseminated. Further, she stated this *is* occurring, informally, by way of several groups. However, this method means the disseminated information lacks consistency in content, lags behind the most recent developments, and access is exclusive/dependent on one having access to the relevant person(s) or groups.

A program needs to be developed that provides for both novice and experienced coaches and referees. Such a program must include modules focused on the differing levels of coaches and referees, which is currently lacking. In-depth detail must be made available for more experienced referees and coaches. Such a program should be designed to be delivered electronically.

Within this program, there could be testing milestones or gates that a participant must pass or achieve a certain grade on to progress. The program should also provide feedback on participants' performance. Currently, course participants usually only receive notification on whether they passed or failed.

Participant K also considered that education extends to the actual application of interpretation during a live match. As such, it is important for referees to be provided with feedback on their performance during an event. This enables the referee to work on areas in which they are lacking; for example, a referee could have knowledge of a particular rule or its application but is not strong in actually applying it.

Participant L

Participant L is an international referee in kyorugi, with her qualifications certified by World Taekwondo. She has officiated in national and international kyorugi events up to and including world championships. She is a member of her national body and has held various committee positions at the national and state body levels, including referee chairperson for both the national and state bodies. Participant L had been a member of the regional kyorugi education committee for referees and is currently a kyorugi referee education presenter for her national body. She is an instructor at one of the larger Taekwondo clubs in her country, where she has been training in Taekwondo for over 20 years. While she is knowledgeable about poomsae, her refereeing ranks are only in kyorugi. Participant L holds tertiary qualifications in education and works full-time as a high school teacher, which is her primary source of income. She also manages the family home with her husband and their children.

Participant L Narrative

Participant L considered her most memorable experience to be her most recent international referee refresher course in Sweden. This was due to the participants being

engaged and encouraging of each other. She found this course to be a better educational and collaborative experience due to the diversity of questions being asked, which led to greater discussion and a greater learning experience.

She did, however, note that the size of the cohort (approximately 200) created limitations and problems with the practical components of the seminar. She suggested this could be eased by either limiting the number of participants or structuring the seminar so that smaller groups were formed. She noted that the latter would possibly create other logistical problems, as the venues would need to have sufficient flexibility to accommodate the number of participants and provide audio and presentation facilities for multiple groups. She felt that the seminar presentations should not be limited to PowerPoint but should incorporate video clips from matches and demonstrations of various components of competition rule interpretations to reinforce or support the discussions on specific rules or interpretations.

Participant L pointed out the language barrier in delivering education for coaches and referees. While English is the official medium of delivery for the education programs, it is not the native language of many course presenters, examiners and those preparing examination papers. She noted a reasonable interpretation difficulty; for example, a question written by a non-native English speaker can be phrased such that it is interpreted differently from the intended question. This also applies to the general discussion of points raised during seminars, though to a lesser extent. Participant L suggested that examinations could be online and in a verbal format, as she considered the spoken word to be a different skill set from the written word. This form of examination would be more productive as English is used for all communication during competition and competition matches, with the exception of referees' commands (which are in Korean).

Online delivery could be extended to include education, pre-seminar and pre-competition modules with built-in testing, and used in conjunction with apps to allow referees to practise and be tested on scoring with online clips from prior competitions.

In addition to the language barrier, Participant L cited the inhibitors of travel logistics, costs, and time away from work and family. She also considered individuals' attitudes could be an inhibitor; some participants are directed to attend or are required to attend to maintain their accreditation, yet believe there is nothing to learn from the seminars or find the seminars wanting.

Travel is an important inhibitor; depending on a coach's or referee's location, attending a seminar and/or reaccreditation course could require a multi-flight trip easily exceeding 24 hours. To address this, seminars and courses could be run online using collaborative technologies such as Skype and Zoom.

The majority of pre-competition work and seminar components could be delivered online. Discussions, questions and answers sessions could easily be facilitated via an online collaborative tool such as Zoom. Moving to an online delivery environment would reduce participants' time away from work and family. Participant L also noted that prior to a major international event, refereeing officials are required to attend a three-day training seminar that covers the majority of the reaccreditation/refresher seminars. However, referees are still required to attend reaccreditation/refresher seminars every two or three years. Having even some of the educational programs delivered online would have positive impacts. She considered that the pre-competition days could be more efficiently spent focusing on more important matters and discussions. Additionally, those officiating at that level, by virtue of attending and participating in pre-competition seminars, should not be required to also attend reaccreditation/refresher courses.

The delivery of education needs to be somewhat flexible, as she considered a more kinaesthetic learning style would cater to the majority of participants. That is, while it is important to have a sound understanding of the rules and their interpretations and application, people will gain a better understanding through experiencing application. This could be done via online videos, match simulations or match play, or specifically staged matches to focus on specific areas. While delivering an educational program to such a broad range of potential participants is difficult and challenging, Participant L considered a participant's attitude and willingness to learn to be a key factor. This needs to be fostered by the seminar presenter(s). Additionally, the presenter(s) should have the skill sets to foster and encourage discussion among the participants for deeper and more applicable learning while allowing the participants to learn via their most effective learning style.

Appendix H: World Taekwondo Recognised Suppliers

Source: World Taekwondo. (n.d.). *Recognized companies*. Retrieved 30 April 2023, from http://www.worldtaekwondo.org/wtpartners-wt/recognize.html.

Appendix I: Protection Scoring System (PSS) Comparison

Aspect	KP&P	Daedo
System flexibility	Judges can score in matches using the handheld referee scoring boxes (scoring devices) without the electronic protector.	Judges can score in matches using the handheld joy sticks (scoring devices) without the electronic protector.
Transmitter	The number of strikes and impact is registered and traceable through the match history.	The match log file contains all registered strikes for that match.
Proximity sensor	The sensor is flat and spans across the entire scoring area of the chest protector. The sensor can be replaced or repaired independently.	The sensors comprise of a strong magnetic field, accompanied by a current when in proximity to the chest protector. The sensor cannot be replaced or repaired.
Impact sensor	The impact sensor is composed of thin separate polyolefin layers, manufactured in a continuous biaxial orientation process, stretching the films in two perpendicular directions. The sensors can be replaced and/or repaired.	Cables which are designed specifically to be resistant and durable. These cannot be repaired or replaced.
Repair of faulty components	Proximity sensor, impact sensor and transmitter are repairable and/or replaceable.	Faulty components cannot be repaired.
Impact to scoring reaction time	0.1 seconds.	Less than 0.5 seconds

Consecutive scoring capacity	Four strikes per one second.	Three strikes per one second.
Hogue	Single sided with one proximity sensor and one impact sensor. Even though transmitter is in-built, it may be removed for repair or replacement.	Double sided with one proximity sensor and two impact sensors. Transmitter is removable.
Hogue weight by size	0 – 1 kg 1 – 1.1 kg 2 – 1.2 kg 3 – 1.3 kg 4 – 1.4 kg 5 – 1.5 kg	00 – 1 kg 0 – 1.1 kg 1 – 1.2 kg 2 – 1.3 kg 3 – 1.5 kg 4 – 1.7 kg 5 – 1.9 kg
Water resistant	Yes.	Yes.
E-foot protectors	Radio Frequency Identification (RFID).	Electromagnetic.

Note. Adapted from Hong, P. (2014). *A comparison of the two WTF recognized Protector Scoring Systems (PSS)*. MasTKD. http://en.mastkd.com/2014/01/daedo-vs-kpp/.

Appendix J: Recommended Modules and Micro-Modules

Module	Micro-module
Athlete – weight	Weight categories
	Weigh-in procedures
Athlete – equipment	Gear
	Inspection procedure
	Inspection PSS
Athlete – qualification	Nationality
	Dan grading
Coach and team medical	Coach qualification
	Doctor/physio qualification
Officials	Referee qualifications
	Competition Supervisory Board
	Technical delegate
Protection Scoring System (PSS)	Daedo set up and running system
	Daedo crashes and problems
	KP&P set up and running system
	KP&P crashes and problems
Video review	IVR request – coach
	IVR request – referee and review juror
	Dartfish set up and running
	Process when no IVR available
Competition area	Courts
	Officials positions
	Weigh-in stations

Scoring points	Valid scoring areas – head
	Valid scoring areas – body
	Valid scoring techniques
	Non-scoring areas
	Prohibited areas on the body
Prohibited acts – penalties	Crossing boundary line
	Attacking the head
Match decisions	
Knock down	Knock down process – referee
	Calling doctor
	Return to competition

Note. IVR = instant video replay.

Appendix K: World Taekwondo Committees with Oceania Taekwondo Union Representation

Member Relations and Development Commission—one member from Australia*

Technical Commission

Athletes Committee

Coaches Committee

Development Committee—one member from Australia*

Education Committee

Integrity and Ethics Committee

Finance Committee

Games Committee

Judicial Committee

Medical and Anti-Doping Committee

Poomsae Committee—one member from Australia

Referee Committee

Sustainability Committee

Taekwondo for All Committee

Para Taekwondo Committee

Para Taekwondo Classification Committee

* These two positions are held by one person.

Oceania Taekwondo Union (OTU) has representation on three of the committees.

Australia is the only OTU country with representation on any of the World Taekwondo committees. Source: World Taekwondo. (n.d.). *Commissions and committees*. Retrieved 30 April 2023, from http://www.worldtaekwondo.org/about-wt/committees.html.

Appendix L: Other Preceding Works and Publications by the Author

Publications: Preceding Works Related to This Project's Theme

Speeches

Leveaux, R. (2019, November). *Keynote speech*. 34th International Business

    Information Management Association Conference, Madrid, Spain.

Journal Articles and Conference Presentations

Leveaux, R. & Ornate, R. (2019). Augmented reality and mobile technologies in

    building management systems: A case study. *Journal of Mobile Technologies,*

    Knowledge and Society, *2019*. DOI: 10.5171/2019.329623.

Ha, T. Q., Al-Kilidar, H. & Leveaux, R. R. (2019). *A review of issues surrounding the*

    adoption of technologies by SME's in Vietnam [Paper presentation]. 33rd

    International Business Information Management Association Conference,

    Granada, Spain.

Leveaux, R. R. & Ornate, R. (2018). An application of augment reality and mobile

    technologies in building management systems. In K. Soliman (Ed.), *Vision*

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    (pp. 3191–3203). IBIMA.

Leveaux, R. R. (2017). An elite sporting organization's perceptions to the uptake of

    information technology. *IBIMA Business Review*, *2017*.

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Leveaux, R. R. (2017). An examination of information technologies changing the shape

    of sport. *Communications of the IBIMA*, *2017*.

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Leveaux, R., Sixsmith, A. & Gallagher, S. (2016). Creating a situated learning environment in the classroom for final year IT students. In *Proceedings of the 28th International Business Information Management Association Conference – Vision 2020: Innovation management, development sustainability, and competitive economic growth* (pp. 4540–4552). IBIMA. https://opus.lib.uts.edu.au/handle/10453/74859

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Leveaux, R. (2012). Decision making technology at the 2012 Olympic Games

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    Sustainable growth, entrepreneurship, and economic development –

    Proceedings of the 19th International Business Information Management

    Association Conference (vol. 3, pp. 1646–1653). IBIMA.

Leveaux, R. (2011). A further examination of Taekwondo instruction using traditional

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