Japanese expert teachers' understanding of the application of rhythm in judo: a new pedagogy

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Abstract

Aim

The aim of this research is to understand the application of rhythm in judo through the experience of expert Japanese coaches.

Background

Scientists and experienced coaches agree rhythm is an important skill in people's everyday life. There is currently no research that investigates the importance of rhythm in judo. People with a highly developed sense of rhythm, move properly, breathe properly, or begin and finish work at the right time. Where sport is concerned, motion and dance can play an important role not only in the improvement of performance, but also in the reduction, or even prevention of, injuries. Those who are naturally musically inclined (have a musical ear) may find they can improve their technique faster than others, and this is something that, by investigating the way expert coaches understand the application of rhythm in judo, this research seeks to understand.

As Lange, (1970) stated, factors of movement are 'weight, space, time, and flow on the background of the general flux of movement in proportional arrangements' (Bradley, 2008; Selioni, 2013; Youngerman, 1976), therefore, this research will investigate the interaction of body and mind. Dance training as well as judo are somatic experiences that have as their ultimate goal the attainment of a skilled body. With quality training an athlete gains an increased awareness of their body which leads to better control of movement and is very important for judo athletes. This training is found in Japanese kabuki dance (Hahn, 2007), the Greek syrtaki dance (Zografou & Pateraki, 2007), and in walking techniques used in the traditional and Olympic sports of Japanese judo and Greek wrestling.

Methods

Interpretative phenomenological analysis (IPA) was the most suitable data analysis approach for this study for a number of reasons, mainly because it was considered to most closely reflect the author's realist epistemological view. The idiographic approach and framework, particularly on IPA, was regarded as a useful framework in which the current topic could meaningfully be explored.

As this study is one of the first to explore this new thematic area, IPA was the preferred approach to address the goal of providing a detailed account of the expert's experience. Therefore, semi-structured interviews were used as a data source. This is the most conventional form of data collection using IPA and most closely reflects the researcher-participant relationship. Semi-structured interviews provide considerable flexibility by allowing the researcher to be guided by the phenomena of interest to the participant.

In this study, purposive sampling was achieved using inclusion criteria pertaining to the research question.

Using the ranking system criteria based on the belt in combination with age employed by the International Judo Federation (IJF) and Kodokan Judo Institute, six expert coaches of forty years old and over with a minimum belt rank of 6th *dan* were selected as a sample.

Results

Both interviews and the codification process contributed to new findings regarding the application of rhythm to judo, and judo itself as a pedagogical tool.

The diagrammatic model can be considered a 'guideline' to the phenomena deemed most significant. The personal significance of rhythm in judo was evidenced by the frequency with which the interviewees naturally referred to it during the interviews. A number of interviewees said that it was important for rhythm to be second nature. Rhythm was also described as an integrated and representative

element in the context of training. This framework was seen as essential in providing the reader with a contextualised understanding of the phenomena considered most important for the current research. Interviewees reported various motives for employing training in rhythm such as faster technical development, better attack/defence, fitness, speed, skills acquisition, personal and spiritual growth, competition results.

Conclusions

This study offers first-hand accounts from professional coaches of a previously unknown phenomena, namely the use of rhythm in judo, and sheds insight on how judo experts understand rhythm in terms of training, competition, and personal growth. These findings suggest that outside of training, coaches play an important role in teaching, mentoring, and leading students. In conclusion, the research revealed four important points which form the basis of a new method of teaching judo: pedagogy, skills, rhythm and movement.

Keywords: Judo, rhythm, pedagogy, skills, movement.

- Dedicated to my wife Nadia and son Nastos –

Acknowledgments

In his poem about the Greek island “Ithaki, one of the most well-known works by the Greek poet Kostas Kavafis (1863-1933) contains these lines*: ‘’Σα βγεις στον πηγαιμό για την Ιθάκη, να εύχεσαι νάναι μακρύς ο δρόμος, γεμάτος περιπέτειες, γεμάτος γνώσεις’’* (when you set out on your journey to Ithaki, pray that the road is long, full of adventure, full of knowledge.) It is in a similar spirit that through the journey of his research process the researcher broadened his horizons, and through analysis of the interviews revealed new data regarding the way judo practitioners and coaches alike could learn and benefit from their perceptions of rhythm. As an active coach and a member of the big family of the sport of judo, the researcher feels lucky to have had the opportunity to address the issue of rhythm and is grateful that he has learned much more than he could have imagined.

Firstly, I would like to thank the judo instructors who devoted precious time to participate in my research work and for sharing their most valuable experiences with me.

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I am especially grateful to my professor, mentor, and friend Dr Mike Callan, who believed in me and motivated me to continue with my doctoral studies. I am grateful, as without him, I would not have made it this far.

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Table of Contents

List of Tables

List of Figures

Glossary

The key abbreviations used throughout the dissertation are detailed below:

IJF International Judo Federation
IPA Interpretative Phenomenological Analysis
EJU European Judo Union
TE Textual Elements
NI Number of Interviewees
KTK *Kuzushi* (break balance), *tsukuri* (set-up to execute), *kake* (execution of technique)

The Japanese terms used throughout the dissertation are detailed below:

Ashi-waza Foot techniques
Ayumi-ashi Ordinary pattern of walking
Dan Black belt rank
Dojo School or training hall for studying the way
Ippon Victory in one move, one point
Jita-kyoei Principle of mutual prosperity
Judo Gentle or flexible way
Kake Completion or execution of technique
Kata Forms
Kodokan Judo institute in Tokyo where Judo was founded
Kuzushi Unbalancing the opponent
Ma-ai Space or engagement distance
Mae Forward, front
Mae-sabaki Frontal escape
Mae-ukemi Falling forward
Nage Throw
Nage-komi Repetitive throwing practice
Nage-waza Throwing techniques
Ne-waza Techniques on the ground
Randori Free practice
Seiryoku-zenyo Principle of maximum efficiency
Shiai Contest
Tachi-waza Standing techniques
Tai-sabaki Body control, turning
Te-waza Hand techniques
Tokui-waza Favorite or best technique
Tori Person performing a technique
Tsugi-ashi Walking by bringing one foot up to another
Tsukuri Entry into a technique, positioning
Uchikomi Repeated practice without completion
Uke Person receiving the technique
Ukemi Breakfall techniques
Ushiro-ukemi Falling backward
Waza Technique
Waza-ari Near ippon or half point
Yakusoku-geiko Pre-arranged free practice
Yoko-ukemi Falling sideways
Mae-mawari-ukemi Forward rolling breakfall

Publications and Presentations

Publications

Callan, M., & Bountakis, G. (2017, June). Judo rhythm through music and dance. In *Conference Proceedings-4th European Science of Judo Research Symposium & 3rd Scientific and Professional Conference on Judo: "Applicable Research in Judo "*. University of Zagreb.

Bountakis, G., Kanamaru, Y., & Burns, A. (2018). Talent identification, development and the young judo player. In *The Science of Judo* (pp. 57-66). Routledge.

Bountakis, G. (2018, June). Judo and rhythm; the important stage of the athlete's development. *In Conference Proceedings-5th European Science of Judo Research Symposium & 4th Scientific and Professional Conference on Judo: "Applicable Research in Judo ".* University of Zagreb.

Presentations

The contents of this PhD have been presented in practioner national, international and Olympic Committee technical seminars on the following occasions:

- GBR Masterclass (rhythm) London, 2018
- GRE Seminar (how to teach U8) Athens, 2019
- PLE Seminar (the Japanese talent pathway) Jerusalem, 2019
- JOR Masterclass Amman national team, 2019
- GRE Seminar (gripping) Athens, 2019
- GBR Masterclass (gripping) London, 2019
- TKM Technical course for coaches (10 days) Ashgabat, 2020
- GBR Masterclass (three stages of throw) University of Hertfordshire 2022

CHAPTER I: INTRODUCTION

1.1 Introduction

The history of judo is one of the transformations of a martial art into a modern sport that today is also an Olympic sport, and is practiced by millions of people around the world (Niehaus, 2006; Peset Mancebo et al., 2013). For decades, judo was the only Asian combat sport in the official Olympic programme (Brousse & Messner, 2015). In Japan, the founder of judo, Dr Jigoro Kano, dedicated his life to the education of the youth of his country. Through his teachings he combined tradition and modernity with the progress of the individual in the service of the community. The beginnings of judo are closely related to the tradition of Japanese combat, life arts and the personality of Kano (Hoare, 2009).

In Japanese, the word 'judo' is written using the ideograms 柔道 and means 'gentle way' (嘉納治五郎, 2005). Judo is a Japanese martial art founded by Professor Jigoro Kano (1860-1938) in the year 1882. Kano was born in the town of Mikage in the Hyogo Prefecture. He earned a degree in Literature from the Tokyo Imperial University in 1881 and a degree in Philosophy the following year. Judo is a modification of the art of *ju-jutsu*. Kano founded the Kodokan ('school to learn the way') in a small room in the Eishoji Temple in Tokyo in 1883 (Watson, 2008). Rival dojos considered the Kodokan to be conceited and the premises were damaged to provoke retaliation in the form of a challenge match and the ensuing matches invariably ended in victory for the Kodokan.

From the twelfth to the nineteenth century Japan was ruled by warriors called *samurai* (lit. one who serves), who, in addition to fighting with swords and bows and arrows, developed *ju-jutsu* to enable them to fight enemies by hand in close combat. Their rule came to an end with the Meiji restoration of 1868 (Brousse & Matsumoto, 1999; Kanô & Cadot, 2013; *The History of Judo*, 2019), but their legacy lives on in the history of martial arts.

Classical *budo* (lit. martial way) appears during the Tokugawa shogunate (1603-1868), a different period in Japan's history. Peace imposed during the Edo period greatly reduced the ability of the samurai to practice their art on the battlefield and the ensuing political and social stability transformed the daily life of the warrior. The *bujutsu* masters sought to change the atmosphere caused by the samurai inertia

so, in their teachings, they pursued the strengthening of their moral and philosophical principles. Modern *bujutsu* and *budo* emerge from the Meiji era and, while they are technically inspired by classical forms, they bear the signs of the transformation of Japanese society (Draeger, 1973).

Judo is now well-known around the world as an Olympic sport, according to UNESCO, martial arts practice is a foundation for both mental and physical health. Martial arts for youth development frequently focuses on teaching respect, self-control, and discipline via regular practice (Baxter-Tresise et al., 2019). According to Kowalczyk et al., (2022) the approach of judo training as a structured kind of physical activity that can be used to supplement the daily dose of activities suggested by the World Health Organization for children's overall health. (Kowalczyk et al., 2022).

Since ancient times, dance has been a symbol of the conscious awareness of the presence of life. The human body is an instrument of dance. Dance is a ritual for participation, not simply for viewing, and is a force that goes beyond the meaning of words. Due to the peculiarities of rhythm, dance has become a prime metaphor of our existence; in the time before visual art it played a vital and necessary role. This can be seen in ancient cultures all over the world where people can be observed dancing for religious practices (Sfetcu, 2014).

The Greek philosopher Aristotle (384-322 BCE) defined education as a mixture of music and gymnastics, while Socrates (470-399 BCE) wanted dance to be taught more widely, saying that, ‘they who honour the gods best with dances are best in war’. Plato (427-347 BCE) wrote, ‘So the well-educated man can learn to sing and dance well’ and dedicated much of his attention to the importance of dance education in his treatise of "Laws".

1.2 Aim of the Research

The aim is to explore how expert coaches understand the application of rhythm in judo.

There is currently no research in the field of judo that addresses the question of why rhythm is important. Scientists and experienced coaches agree that rhythm is

an important skill in the peoples' everyday lives (Reilly, 2009). People breathe properly using rhythm, (Farhi, 1996) and, where sport is concerned, motion and dance can play an important role not only in the improvement of performance and may help in the reduction of injuries (M. Konegawa, personal communication, November 19, 2018).

Aftimichuk (2015), stated that rhythm organises motor human action, making it more productive and reasonable, much as it does in nature and in living organisms. The process of impellent work correct rhythm assimilation plays an important role in teaching working and sports motions because it determines the movement performance optimum that is shown in its automation process reduction, as a result of which man's physical strength and nervous energy are saved (Aftimichuk, 2015). The physical training specialist gains a specific standing in the rhythm area. The rhythm underpins all of his activities, including the motor component (Aftimichuk, 2015).

Those who are naturally musically inclined (have a musical ear) may find they can improve their technique in sports faster than others (Karageorghis, 2008), and this is something that, by investigating the way expert coaches understand the application of rhythm in judo, this research seeks to understand.

Because factors of movement are 'weight, space, time, and flow on the background of the general flux of movement in proportional arrangements' (Selioni, 2013), this research will investigate the interaction of body and mind. Dance training as well as judo are somatic experiences, Asian martial arts and bodily disciplines of judo, aikido, are somatic experience through dance (Eddy, 2002) that have as their ultimate goal the attainment of a skilled body. With quality training an athlete gains an increased awareness of their body which leads to better control of movement and is very important for judo athletes (Feigley, 1984). This training is found in Japanese kabuki dance (Hahn, 2007), the Greek syrtaki dance (Kapodistria & Chatzopoulos, 2021; Karavidas & Papatheodorou, 2020) and in walking techniques used in the traditional and Olympic sports of Japanese judo (Bountakis & Callan, 2017).

1.3 Research Questions

As this is a qualitative exploratory study, rather than offering specific hypotheses, it will address a number of questions. Based on many years' experience as a coach at the highest level, the researcher contends that rhythm, pattern, synchronisation, and time are all basic skills that an athlete needs to develop when training in judo. A sense of time should be established for the best time to apply techniques in *randori* (free practice) or competition.

To explain further; the following '10 Steps to approach Rhythm' list (Bountakis & Callan, 2017) presents some important features of patterns and rhythms in a variety of environments and provides some basic exercises useful for developing awareness and enhancing the use of rhythm, patterns, and timing in judo, (see Table 1).

Table 1

10 steps to approach rhythm

1	*Ayumi-ashi* and *tsugi-ashi* – leg work - moving forwards and backwards (*hokyo* game)
2	*Tai-sabaki* grip - body – *tandoku-renshu* (learning game)
3	*Tai-sabaki* in pairs (*tori* leads - *uke* follows)
4	Side *okuri-ashi-barai* and *yoko-tomoe-nage* (with partner)
5	*Hikidashi* and grip (tempo with clapping and rhythm with music) for understanding the basic principles of rhythm
6	Moving *hikidashi* (distance and rhythm with music)
7	Static *uchikomi* at a distance of one metre (*osoto-gari* at the same time)
8	Moving *uchikomi* (combination and rhythm)
9	Cyclic *uchikomi* (learning game)
10	*Nage-no-kata* (rhythm and time with music)

The research is original as it considers the point of view of the application of rhythm in judo training based on the experience of high-level Japanese coaches. More significantly, the research looks in detail at the role of rhythm in movement during *kata*, *randori* and *shiai*.

1.4 Brief Introduction to Judo

To understand the nature of judo, it is important to be aware of the sport in more depth than described previously. Judo is known as both a martial art and an Olympic sport.

Jigoro Kano, the founder of judo, took *ju-jutsu* techniques, which were at the time considered the art of self-defence, and modified them to create 'judo' (lit. *ju* - gentle and *do* - way) which was more of an educational way (Kano, 1932; Roberts, 2009). Judo is more than sport (Knaup, 2021), judo is an education system, a system of physical, and moral education, it provides a code of ethics, a way of living, and a way of being (Brousse & Matsumoto, 1999). Judo is a combat sport that demands both physical prowess and mental discipline (Webber & Collins, 2005). Judo involves various techniques in both standing and ground positions and first appeared as a 'sport' during the 1964 Tokyo Olympic games.

1.5 Researcher's Background

The researcher has been a judo coach for more than 28 years. Having studied in Japan at Tsukuba University in 1989 while training as an athlete as a member of the Greek Olympic judo team, the researcher returned to Athens and founded the 'Budo Center' judo club. His goal was to become a coach who was passionate about creating champions with a good strength of character and who, through proper behaviour and attitude, would benefit society. Following the Olympic Games in Greece Athens, 2004, he began to focus on developing methods for improving the technical level of the athletes.

The researcher's professional background in relation to the research topic will be described because the researcher needs to be transparent about his or her identity, background, and motivation for participating in the research (Madill et al., 2000). By disclosing their position in relation to the investigative topic, the researcher enables readers to evaluate how certain factors may have impacted on that generation of

knowledge (Lutz, 2013). The reflectivity of the researcher shows clarity and reflection (Steier, 1991).

The background of the researcher is particularly relevant as Interpretative phenomenological analysis (IPA) is an approach to psychological qualitative research, qualitative and phenomenological research, IPA method understands psychological phenomena between researcher and participants (Langdridge, 2007). These phenomena are based on experiences of personal importance, such as is gained during a general life event, or during the development of an essential relationship, the theoretical origins and ideas in phenomenology come from Edmund Husserl, Martin Heidegger, and Maurice Merleau-Ponty (Smith, 2007).

After the London Olympics, where the researcher participated as a coach, and in conjunction with the ongoing changes to the International Judo Federation (IJF) regulations, he began to consider training methods that would help athletes improve their scores. More recently, following academic study in the UK, and alongside his position as national coach of the Welsh Judo Team, he began to consider how rhythm could be utilised in various ways during training such as through music, dance, or even through the rhythmical use of different objects. During his judo coaching career (from 1989 to date), he trained in Japanese kendo and Latin dance, which also have distinguishing hip movements on a par with the importance of the judo *koshi-waza* (hip technique) and *ashi-waza* (foot technique) in judo.

The researcher's particular interest in dance comes from the grip technique (i.e. the hand contact made between the two dancing partners), and the attention that a dancer must pay to the little details (K. Karafoulidou, personal communication, January 21, 2019), both of which are equally as important in judo (K. Mitsumoto, personal communication, November 20, 2018). Following many years of dance instruction, the researcher transitioned to teaching the art and it was through that process of teaching rhythm to the students, that the researcher noticed an improvement in his own judo abilities.

Having been an experienced dance and judo teacher since 1989, the researcher realised that dance and judo use similar steps and that the two disciplines have other things in common. It can be explained as follows: If someone learns judo and dance at the same time, they would likely take a daily judo session and a daily dancing session.

In dance, on day one, the first session would focus on how to use the foot. The teacher would likely instruct the student to balance on their toes rather than their heels. Interestingly, this is exactly what a judo teacher would teach in their first session, too.

On day two, the dance teacher would teach grip technique and, if they were learning tango, for example, ways to control a partner. This grip technique is more or less the same grip used in judo during randori when trying to control a training partner.

On day three, the dance teacher would explain the first steps of a dance. In cha-cha-cha, for example, this would be fast-fast-slow forwards and fast-fast-slow backwards (Waglow, 1956). Similarly, in the judo session, the instructor would teach the similar foot technique of *okuri-ashi-barai* (foot sweep) this will be slow-fast-fast, where the last fast step is throwing based on *nage-no-kata* (Kodokan, 2022).

On day four, the dance teacher would teach new steps, such as the 'crossover', for example, as the first dance-step combination. A judo teacher would do the same thing by teaching *osoto-gari* (major outer reaping), for example, which has a similar grip and would be the first judo combination of *okuri-ashi-barai* to *osoto-gari.*

On days five to nine, the dance teacher would teach more steps, and the judo teacher would teach more techniques which would enable the dancers to start dancing and the judo practitioners to begin *randori*.

After one to two years the dance teacher might review the abilities of the student and suggest they enter into competition. It is conceivable that a judo teacher might so the same. At this stage, it is important to note that in a dance competition venue, judges and spectators are looking for smooth steps with tempo, rhythm, control, body posture and power (Premelč et al., 2019). If the same standards were to be applied to judo competitions, it could lead to the perfect *ippon* (highest score), (IJF, 2022).

The researcher decided to pursue a doctorate not only for his own personal development, but also to find answers to the questions that concerned him as a judo coach, such as improving the technical training of athletes, rhythm, and strategy in competition, reducing the risk of injury, and ways to achieve better competition results.

With this in mind, he undertook a Pre-PhD at the University of Chichester in 2017 addressing the question, “Rhythm; is it important at every stage of the athlete’s development in judo?”. His aim was to provide answers to the question of how to train athletes at each stage of their development through the application of rhythm to their training. The researcher examined the stages of developing rhythm from young learners through to elite athlete and, as national team coach for Wales during this period, he had the opportunity to then work extensively with the athletes on their approach to rhythm.

Over the last two years the researcher visited Japan twice to research elite coaches’ and athletes’ opinions of rhythm in judo. In 2017, he spent one month visiting ten high schools that are well-known for their judo training and, in 2018, stayed in Japan for two months, one month of which included a seminar at Tokai University on the subject of “How to Coach Juniors”.

During his time in Japan, the researcher conversed with a number of coaches, three of whom were Japanese Olympic team coaches, and five of whom were national team members. The aim of the conversations was to gain further insight into the research topic while developing the questions upon which the research was based:

What is rhythm in judo?

How high-level teachers perceive the contribution of rhythm in the first steps of the practitioners? How high-level teachers evaluate the importance of rhythm in randori and its relationship in daily training? How top-level players can use rhythm for offence/defence

As the researcher is an experienced coach, his most recent coaching duties being in Wales as a performance coach, he was able to gather information from some of the best teachers and athletes in Japan. Rhythm was something the researcher had been considering for many years, but he felt that the information either on the internet or in discussions with colleagues was generally too vague, and the only information of substance was that rhythm in judo was important for an athlete’s performance.

The researcher's dedication to his work helped him gain positive experiences that enabled him to develop a more flexible approach to students as well as developing alternative ways of teaching them. The researcher’s personal experience

along with his love for judo led to the decision to research the rhythm of judo by using the IPA research method to interview six Japanese experts with the highest possible level in Japanese judo.

CHAPTER II: LITERATURE REVIEW

This chapter is in two main parts. Firstly, a consideration of the academic literature related to rhythm and secondly an overview of the relevant literature pertaining to the technical aspects of judo which underpin this research. The first section takes a funnel approach from rhythm in body, through to rhythm in judo and concludes with a description of the research questions. The second part is an exposition of the technical steps of teaching judo from *ukemi* through to *shiai*.

2.1 Rhythm in Body

Rhythms characterise the many cycles of the human body (Minors & Waterhouse, 1990). Research shows that the heartbeat, breathing, and pulse function with different rhythms throughout the day (DI Cagno et al., 2016), such as during sleep (Miglis, 2017; Yoshihisa et al., 2014; Zhu et al., 2006), and the wake rhythm that follows the 24-hour cycle of the day and night, (Yoshizaki et al., 2013; Yoshizaki et al., 2014). There are also female menstrual rhythms, hormonal rhythms (Papacosta et al., 2016), and the cell renewal rhythm of our body (Podolsky et al., 2015; Stauffer, 2010; Steeg, 2015).

In psychology, stress is a feeling of strain and pressure, and results in noticeable changes in the body (Short et al., 2015). Stress manifests itself as poor mood, weakness, inability to concentrate, nervousness, anxiety, or insomnia (Ono et al., 2015; Papacosta et al., 2016), and these are all signs that the body is exceeding its limits. They may also be a warning that cycles in the body have been disrupted and need to return to their normal rhythms (Cowan, 2016).

From psychology perspective, listeners are frequently compelled to move their bodies in reaction to the beat of music. Groove is a term used in music psychology to describe this sensation (Senn et al., 2020), studies show that rhythmic auditory stimulation (RAS) has been shown to help persons with Parkinson's disease manage their gait (Rose, Delevoye-Turrell, et al., 2019), Groove, according to music psychology, is defined as a person's desire to move in reaction to music, accompanied by a pleasant mood (Senn et al., 2019).

Music learning can also help a child's capacity to detect distance, pace, concentration, and use his or her own receptive, receptive, and receptive nerve systems, according to other study (Rose, Jones Bartoli, et al., 2019) and this is another proof that in children's development of abilities, music plays a decisive role.

Rhythm has a decisive role which commences during pregnancy and is evident in all aspects of our daily lives. Because babies listen to and feel the heart rate, human contact with rhythm is a prenatal experience (Anshel & Marisi, 1978). It seems to be the first experience of the fetal sensations in the micro world of the uterus (Boudreau et al., 2011; Browning, 1972). Initially, the embryo distinguishes different sounds through its pulsating motion, and elements of vibrational movement come from the inside of the mother's body, through her heart rhythm and through her breathing (Clark et al., 2016; Stauffer, 2010).

From a physiological perspective, research shows that the intensity of exercise is likely to affect the rhythm of breathing, and concludes that people must train, for example with slow running, to improve breathing rhythm that leads to a better quality of life (Bechbache & Duffin, 1977). Bipedal walking may have influenced the development of the evolution of rhythmic abilities (Larsson, 2014). Conversely, another study showed revealed that running training had no effect on the coordination between running and breathing rhythms (Bernasconi et al., 1995).

Body temperature also affects the circadian rhythm, and the routine changes to our body temperature on a daily basis is another very serious point for discussion; the rhythm of temperature of the human body is different for a baby than it is for an adult, Abe et al., (1978) and Refinetti & Menaker (1967) concluded that changes in human body temperature aligned to circadian rhythm (the sleep-wake cycle) are developed by the age of seven years. Research shows a connection between circadian rhythm and body temperature, and that heart rate affects body temperature, for example, when the heartbeat increases, body temperature also increases (Refinetti & Menaker, 1992). The same occurs during sleep because circadian rhythm is connected to body temperature rhythm (Blake, 1967). Other studies show that on waking in the morning body temperature is at its peak for the optimum performance for the requirements of the day (Blake, 1967; Charles et al., 1980). According a paper published in the Journal of Science Advances, climate change, whether hotter or cooler, is another

factor that can affect circadian rhythm and consequently body temperature (Obradovich Nick et al., 2019).

Another cause of a change to the rhythm of the body is a change in environmental conditions such as a change to working hours or long-distance travel (Antal, 1975; Felton, 1975; Rajaratnam & Arendt, 2001). Night work can have an adverse impact on health as it can disrupt the normal circadian rhythms of psychophysiological functions, beginning with the sleep/wake cycle (Berger & Hobbs, 2006; Costa, 1996).

Parallel research results from adults and babies suggests that the movement-sound interaction develops early on (Phillips-Silver & Trainor, 2007). Feeling a beat in music or in movement influences the perception of rhythm in babies (Patel, 2006). Overall, the research above seems to show that rhythm is entwined in everyday life and is connected to, and affects, various aspects of life such as sleeping, breathing, and even our general health.

2.2 Rhythm in Music

2.2.1 Rhythm and music in ancient Greece

Rhythm, music, and the art of fighting have been linked since ancient times in both East and West, music for the ancient Greeks was considered the most essential part of their cultivation and education (Marrou, 1982), and as a result music was regarded in ancient Greece as being one of the most important sources of education. To this day, music education has been appreciated by many civilisations (Mark, 2013). Also important for the Greeks was bravery, boldness, military apprenticeship and governance through art and music (Hobbs & Angela, 2000; Lendon, 1999). War in ancient Greece was a frequent phenomenon and from an early age, boys started practicing becoming powerful warriors (Schmid, 1992). The "healthy mind in a healthy body" was applicable (Παϊταρίδου, 2011). Literature of the period reveals that “healthy mind in a healthy body” was the main component of the Hippocrates philosophy (Kleisiaris et al., 2014). This is in line with Kano’s philosophy, Jigoro

Kano was influenced by a variety of sources throughout his life, the originator of judo was profoundly impacted by a long heritage of philosophy that combined confucian, Buddhist, Taoist, and Shinto influences. Kano's educational system consisted of three key components: the learning of knowledge, the teaching of morality, and the physical training of the body through physical education *"A healthy body is a condition not only necessary for existence but as a foundation for mental and spiritual activities"* (Kano, 2005).

Herbert Spencer, an English Victorian political theorist and philosopher, proposed the *san iku shugi*, or principle of the three educations (Spencer, 1861)**.** Kano elaborated on the concept during a lecture at the Parnassus Society in Athens, Greece, on June 5, 1934, explaining his belief that the goal of physical education should include at least the four items listed above: health, strength, utility, and spiritual training, the latter including Intellectual, Moral, and Aesthetic phases (Callan, 2018a). Judo is now defined as a beautiful system of physical, intellectual, and moral instruction that instils a code of ethics, a way of life, and a way of being in its students (Brousse & Matsumoto, 1999).

In addition to training for war, the ancient Greeks also considered it necessary to develop the spirit, as such, children studied writing, mathematics and music alongside their military training (Δουργούτη, 2014). Sciences and philosophy-rhetoric were also part of Greek education and produced some of the most famous philosophers of ancient Greece such as Plato and Socrates. Special emphasis was placed on ancient literature, and has been written about by many western writers who believed in the works of the Homeric epics "Iliad" and "Odyssey" (Clarke, 1981).

Music was present in almost all activities in ancient Greek society, the word 'music' comes from the Muses who, in Greek mythology, were the daughters of Zeus and the patron saints of the arts (Botsford & Robinson Jr, 2003). Through mathematics, geometry, art and architecture, Greece has significantly influenced the fields and disciplines of sculpture and architecture in the West. In astronomy, Eratosthenes calculated the Earth's orbit with great precision while, in medicine, Hippocrates laid the foundations for health following the doctrine of Plato's healthy mind in a healthy body theory (Cooper, 1977).

It should come as no surprise, therefore, that the Greeks insisted that the truly educated man was the musician "*μουσικός ανήρ*" a man who understands the arts and especially music and poetry (Ψαραδέλλη, 2015), in the teaching of music it seems that students did not use musical texts and learning was achieved through listening and performing music from memory (West, 1992). There are indications that Pythagoras discovered the possibility of representing the fundamental musical relationships in the octave with simple numerical proportions (Ferguson, 2008).

At the time of Plato and Aristotle, literature shows that the application of the arithmetic theory of music was one of the Pythagoreans' main studies and one of the fundamental studies of the Athenians (Clark, 1989). Ancient Greek music, exhibited this power of rhythm and music (Mathiesen, 1985). In Ancient Greece in the 6th century BCE, music was taught earlier than the other arts (Landels, 2002; West, 1992). Rhythms of the human body are different from the musical rhythms of metre, pulse and beat, research has explored human rhythmic abilities and behaviour within specific psychologically valid definitions of rhythm (Bispham, 2006).

2.2.2 The use of music in judo in the present day

Athletes have also employed music during submaximal training (Waterhouse et al., 2010). It is common for judo athletes to listen to music during the warm-up or just before a fight because (Y. Kanamaru, personal communication, November 25, 2018), from a psychological perspective, music is capable of evoking exceptionally strong emotions and of reliably affecting the mood of an individual (Honing, 2013; Koelsch, 2010). Japanese national judo team coaches advise their athletes to only listen to music during the general warm-up and not during the warm-up before the fight itself. The argument for this is grounded in tempo because the tempo of music can be slow or fast (Karageorghis et al., 2011; Szabo & Hoban, 2004). In a discussion held during the Osaka grand slam between a video analyser from the Japanese national team and 60kg three times world champion Takato Naohisa's training partner, it was revealed that listening to music before a competition can be a danger as the rhythm of the music can influence the athlete adversely, and consequently risk the loss of their own rhythm (N. Itami, personal communication, November 24, 2018).

2.2.2.1 Definition rhythm in music

In the book “The Psychology of Music” the author P. Fraisse marks the difference between tempo and rhythm, stating that while rhythm is generally accepted there is no definition of it (Fraisse, 1982). Rhythm comes from the Greek word *ρυθμός* (rhythm) and *ρέω* (flow) (Ματέυ, 1986; Μπέντα, 2010). Plato believed that flowing rhythm was connected with the movement of the body, nowadays, it would be easier to describe rhythm as "any regular recurring motion [or] symmetry" (George et al., 1996).

According to Gittens (2019), the positioning of sounds in time in music is known as rhythm. Rhythm is defined as an organised alternation of opposing components in its broadest definition. Attempts to define rhythm in music have resulted in a lot of debate, partly because rhythm is frequently associated with one or more of its constituents, but not entirely distinct, elements, such as accent, metre, and tempo. The element of rhythm is a composition dependent upon time, rhythm is music’s pattern in time. Plato’s observation that rhythm is “an order of movement” provides a convenient analytical starting point (Gittens, 2019).

2.2.2.2 Tempo

Rhythm and tempo are two related concepts that should not be confused (Wang, 1984). Every musical work has a beating heart, like the seconds of a clock, the speed of the heart is called tempo (Chew et al., 2021). Tempo is the pulse of a piece of music and all good musicians learn to feel it constantly within them (Clynes & Walker, 1982). Tempo, Italian for ‘time’ in musical terminology, is the speed or pace of a given piece of music (Fraisse, 1982). Music is perhaps one of the most remarkable human inventions, though it could be considered a natural ability such as language as it can be a naturally sophisticated biological function (Malloch & Trevarthen, 2018).

From a physiological point of view, musical rhythm during exercise affects the maximum workload (Szabo et al., 1999). There is evidence to suggest that carefully

selected music can promote ergogenic and psychological benefits during high-intensity exercise (Karageorghis & Priest, 2012). The effect of listening to two different kinds of music with a slow or fast tempo for 20 minutes was analysed with regard to the concentration of lactate and ammonia in the blood, listening to music with a slow tempo decreases the plasma norepinephrine level and listening to music with a fast tempo increases the plasma epinephrine level (Yamamoto et al., 2003). This research is fully accepted by the Japanese national team coaches, and as a result they encourage athletes to listen to the appropriate music at the right time (Y. Kanamaru, personal communication, November 25, 2018).

Rhythm in sports as a fundamental part of complex coordination is the key to the effective development of motor skills for sports activities (MacPherson et al., 2009). According to Grădinaru (2015), practicing physical exercise against the background of a variety of rhythms and tempo in primary schools, moulds the skills needed to achieve correct movement. Using music in sports sessions improves kinetics and vestibular sensitivity and, as such, a sense of rhythm and tempo are imperative criteria in vocational schools (GrĂDinaru, 2015). Konstantina Karafoulidou, national Greek champion and Latin dance teacher for many years, mentioned that for her dance is a mixture of speech, expression, emotion and thought, all as a body language expressed through the rhythm and translated into rhythm in dance (K. Karafoulidou, personal communication, January 21, 2019).

2.3 Rhythm in Dance

References to dance can be found in very early recorded history such as the Greek dance horos (*χορός*) which is referred to by Plato and Aristotle (Raftis, 1987). Rhythm (*ρυθμός*) in Greek grammar is one of the three parts (*εν ετεροι*) of poetry which Aristotle names alongside words and melody in the Poetics (Tsugami, 2013). According to Aristotle, the delivery of weapons to teenagers undertaking training was a sacrament because weapons were sacred and belonged to the state (Grant, 1866). However, once the teenagers had taken part in certain rituals, the state recognised them as adults and bestowed on them all the rights and obligations that resulted from such a rite of passage (Simpson, 2000). According to Connor (1988), among the

obligations of young teenagers was learning how to dance around the fire, ‘hoplomachia’ (*χορομαχία*), which involved a military dance performed with weapons, and during which the teenager was judged for his ability to handle the weapons offered to them by the state (Connor, 1988). According to Socrates, the best dancers were the best in war and Lucian noted that Spartan youths danced and engaging in hoplomachia. In Galen's view the gymnastics trainer was best suited to teach dancing, hoplomachia, pankration and wrestling (Wheeler, 1982).

During the feudal period in Japan, samurai used *kenbu* to sharpen their mental concentration and gather strength before a battle (DeMarco, 2020), *Kenbu* translates to "sword dance" and refers to a traditional Japanese dance style with a *katana* sword and a fan (Cunningham, 2012). Miyamoto Musashi mentioned that dance, for example, is a manifestation of rhythm in the world (Musashi, 2003), sword dancing at Samurai *kembu* was art and war technique (Musashi, 1992).

Samurai as an ancient Greeks trained in unarmed fighting, *ju-jutsu* was part of this style of martial arts, which uses few or no weapons, throws, holds, and paralysing attacks on the enemy are all, It was created to help a warrior's swordsmanship during combat (Cunningham, 2012).

Greek Pankration is an ancient martial art that combines both wrestling and boxing techniques, the sport can be traced back to ancient Greece's territories in the second millennium BCE (Walker, 2011). Its name comes from the ancient Greek words *pan* (all) and *kratos* (strength, force, power), and it literally translates to "all of the might." The Pankration (*παγκράτιο*) was first adopted as a sporting event in the 33rd Olympic Games in 648 BCE, where it competed alongside boxing and wrestling in a division known as "heavy events" (Buse, 2006). The best athletes with the greatest strength and endurance competed in that special category of sport and the crowd's favourite sport was the Pankration event. Military training based on this previously unarmed combat method was thought to have helped the Spartans succeed in hand-to-hand combat and soldiers trained in Pankration were highly regarded in the famous Macedonian Phalanxes, with Alexander the Great allegedly giving them first priority in the army's recruitment (Nenova, 2016).

Rhythm and dance are deeply linked to history and practice. Historically, dance movements were largely traditional and could be semi-improvised on the spot

(Landels, 2002). Many books have been written about Greek dance, and great doctors and philosophers of the ancient world left many written texts covering almost all areas of philosophy and medical science, with Hippocrates, Plato, and Aristotle being among the most important (Jaeger, 1965; Stamou, 2002; Φούντα, 2006), in the time of Hippocrates, (father of medicine) doctors were obliged to learn music (Goldberg, 2006),

They regarded physical education as a very good thing because exercise can be seen to both promote health and give pleasure, happiness, and joy in life. Dance has had a central place in didactic theory since the times of these ancient philosophers, both Plato and Aristotle believed that dance was useful for teaching moral and intelligent values as well as enhancing physical skills (Carter, 1984).

Plato said that dance trains the mind and soul, and Aristotle classified dance in educational activities as a thing of value in itself. As dance was seen to benefit the cultivation of the mind, Plato and Aristotle confirmed its importance as a primary element in the development of an educated person (Παϊταρίδου, 2011).

Aristotle defined dance as:

> *"ώσπερ γάρ και χρώματα και σχήμασι πολλά μιμουνταί τινες άπικάζοντες (οί μέν διά τέχνης οί δε διά συνηθείας), έτεροι δε διά της φωνής, ούτω κάν ταίς είρημέναις τέχναι άπασαι μέν ποιούνται την μίμησιν οίον αρμονία μέν και ρυθμώ χρώμεναι μόνον ή τε αυλητική και ή κιθαριστική κάν εί τινες έτεραι τυγχάνωσι ούσαι τοιαύται την δύναμιν, οίον ή των συρίγγων, αυτώ δε τώ ρυθμώ χωρίς αρμονίας ή των ορχηστών 9καί γάρ ούτοι διά αυτώ δε των σχηματιζομένων ρυθμών μιμούνται και ήθη και πάθη και πράξεις)".*

> Translation: "Just as people (some through the art, and some through the habit) use colours and shapes to render mimetic images of many things, others use the voice, so too all the musical arts mentioned produce mimesis in rhythm, language, and melody, whether separately or in combinations. That is, melody and rhythm alone are used by music for aulos and lyre, and by any other types with this capacity, for example music for panpipes; rhythm on its own, without melody, is used by the art of dancers (since they too, through rhythms translated into movements, create mimesis of character, emotions, and actions)" (transl. Halliwell 1999, 29-31), (Peponi, 2017).

In America, dance has been associated with education since colonial times when dance masters provided the more prosperous families with training in graceful bodily movement and social skills (Carter, 1984). The immediate precursors of our modern approach to educational dance were those educators who incorporated German theories of gymnastic dancing into programs for physical education and the teaching of dance in the schools evolved as visionary educators such as Dudley Sargent of Boston and others, introduced "aesthetic dancing" as a part of physical education (Smith-Autard, 2002).

The Japanese Ministry of Education, Culture, Sports, Science and Technology announced that dance should be compulsory curriculum at junior high school from the fiscal year 2012 (*Dance in education*, 2019), and stipulated that the elementary school syllabus include dance sessions at 3rd (8-9 years old) and 4th (9-10 years old) grade with the aim of getting students to interact with each other and to experience improvised dance (Aoki & Naruse, 2013).

Lighting of the Olympic flame ceremony takes place before each Olympiad in the land of ancient Olympia and heralds the opening of the Olympic Games (IOC, 2022). This simple and symbolic ceremony takes place at the altar in the temple of Hera (*Heraion*). The Olympic flame first made its appearance at the Amsterdam Olympics in 1928, while the ceremony and torch relay were introduced at the Summer Olympics in Berlin in 1936. At the flame ceremony in the land of ancient Olympia there were dance performances by priestesses who performed a dance with a rhythmically slow tempo comprising simple choreography. The flame, which remains illuminated throughout the Olympic Games, symbolizes purity and reflects the Olympic ideals shared by nations (*Olympic Flame Lighting Ceremony - Ancient Olympia*, 2021).

The American dancer Ted Shawn said, "the conception of rhythm which underlies all studies of the dance is something about which we could talk forever, and still not finish" (Poole, 1947). The 20th-century American dancer Eleni Moller, said, "dance is a rhythm and a form more than harmony" (Moller, 1918). A musical rhythm comprises two main elements; firstly, a regularly repeating pulse (also called the "beat" or "tactus") that establishes the tempo and, secondly, a pattern of accents and

rests that establishes the character of the metre or basic rhythmic pattern (Bennett & Riemer, 2006). Dances generally have a characteristic tempo and rhythmic pattern.

The tango, for example, is usually danced at approximately 66 beats per minute. The basic slow step, called a "slow" lasts for one beat and is a full "right–left" step. The basic forward and backward walk of the dance are counted thus - "slow-slow" - while many additional figures are counted "slow - quick-quick" (Grube et al., 2005). Just as musical rhythms are defined by a pattern of strong and weak beats, so repetitive body movements often depend on alternating "strong" and "weak" muscular movements. To be in the wrong rhythm is to be out of kilter. To be in the right rhythm is to be part of, entrained with, something greater than oneself (Goodridge, 1999). Japanese researchers contend that dance consists of 'primitive motions'. Their experimental results confirm that a motion structure analysis found that these primitive motions occurred in harmony with the musical rhythm (Shiratori et al., 2004).

Over many years' experience, the researcher has noticed that both dance and judo have many similarities, specifically international-style Latin dancing and judo, both of which use leg movements (*tai-sabaki*) as well as using grips (*kumikata*) and moving in a sequence of steps (*kata*). Mambo steps, for example, are similar to the judo leg technique (*ashi-waza*) as is the Cha-Cha-Cha (*okuri-ashi-barai*). Rumba steps are like hip throw techniques (*koshi-waza*), and Samba and Jive steps (fast tempo) are useful drills for the legs. The Paso Doble is very impressive with regards to how dancers control space and time and mirrors exactly what is strived for in judo.

Minoru Konegawa, the Japanese national team coach responsible for the male -60kg and -66kg categories stated that, "If from an early age someone has dance experience, he knows how to use his body and this is very useful in judo" (Konegawa, personal communication, November 19, 2018). When a second national team coach was asked to give his opinion on the role of dance in judo, he stated that, "Athletes who have dance experience can improve their movements faster than others who don't have this experience because the movement *tai-sabaki* is similar to dance movement. So, dance movement is good training for improving *tai-sabaki* in judo" (Y. Kanamaru, personal communication, November 25, 2018). It is clear therefore that some expert judo coaches agree there is a similarity between judo and dance.

2.4 Rhythm in Sport

In sport, rhythm is of great value when researching technique, technical optimisation and technical style in the areas of sports instruction and training (LeClair, 2014). Different sports use different techniques to teach athletes rhythm, one of those being table tennis (Anping, 2009). A study of children aged eight to ten years old, showed that when they are rhythmically trained there is an improvement in the rhythmic precision and stability of their forehand groundstroke, therefore, it can be seen that the relationship between rhythmic ability and motor skills is important to developing young athletes (Zachopoulou & Mantis, 2001).

Developing the ability to be rhythmically accurate and to have a steady pace in one's movement from an early age can be seen as one of the basic skills in the career of an athlete (CSL, 2022; Hodges & Williams, 2012). A study conducted on children aged five to nine years old playing three different sports, tennis, swimming and basketball, was used to compare their rhythmic abilities, the results showed that the group playing tennis had more accurate rhythm, the children in the swimming group had a steady rhythm, and the children in the basketball group performed better when playing the game at a fast pace (Zachopoulou et al., 2000).

Another study looking at the differences between elite and non-elite male basketball players, showed that elite players had better rhythm than non-elite players. Elite players were better at memory retention, selective attention and forecasting (Kioumourtzoglou et al., 1998). Rhythm is the basic factor of a basketball team's strategy and it is really important for the team to understand and apply rhythm to win the game(Chen & Xu, 2003). Zhibo, L. C. L. (2006) talking about the Rhythm of the Modern Basketball Movement, mentioned, with the advancement of modern basketball, that the rhythm of the match is becoming increasingly crucial. If the rhythm of the match can be kept under control, the team will gain an advantage and it will be easy for them to win. The study researches and analyses the modern basketball rhythm in order to aid training and competition (Zhibo, 2006).

Söğüt, M., Kirazci, S., & Korkusuz, F. (2012) "The effects of rhythm training on tennis performance", mentioned that, rhythm training is an integral part of sports, the study evaluates the effects of shorter and longer tempos on rhythmic performance

and to compare the levels of development in tennis specific and general rhythm training. The findings showed that participants improved their tennis playing skills, forehand consistency performance, and rhythmic competence by participating in tennis-specific or general rhythm training (Söğüt et al., 2012).

From a psychological perspective, temporally structured or rhythmical interventions can play a critical role in facilitating the execution of movement patterns in high-pressure performance environments (MacPherson et al., 2009). Research suggests that systematic rhythm education improves performance, and that rhythmic ability is an important element in sports (Aftimichuk, 2015). Surveys of tennis and basketball revealed that athletes had higher scores when performing with a fast rhythm than when performing with a slow rhythm (Söğüt et al., 2012).

On the other side of the coin, the question is: does one or two months of research give us the certainty or the indication that the participants' rhythmic ability is increasing? There are no clear answers as to why tennis and basketball players have better scores when playing with a fast rhythm as opposed to a slow rhythm. It has been recognised that for runners that the time taken from one point to the other is not important, the most important factor is the rhythm that the runner must maintain (Heywood, 1970).

For hurdlers who lack rhythm, hurdling is like trying to dance the tango with two left feet. Marc Mangiacotti (2015) gives three ways to teach hurdlers rhythm, one of which is teaching 'the feeling of running between the hurdles', because neither the body type of the athlete nor the time the athlete runs in the hurdle race actually matters. All athletes are trying to take three steps between each hurdle and that means the best hurdlers are those who have a faster rhythm between the hurdles (Mangiacotti, 2015).

The research of technique characters, technique optimization, and technique style in sport teaching and training will benefit greatly from the study of sport rhythm. Li, M. A., & Wen-bin, T. I. A. N. (2007) "The Research and Breakthrough of Sport Rhythm", the study analysis showed that, "the sport rhythm is a synthetic indictor of representation and exploitation of athletes' sport ability and involves the joint study of many subjects". Currently, the theoretical study of sport rhythm in various groups of subjects is in an unbalanced state, and the study of sport rhythm in complicated topics

should employ a strategy that combines precise data analysis and phenomenology research (Li & Wen-bin, 2007).

Extreme sports such as base jumping, big-wave surfing, extreme skiing, waterfall kayaking, extreme mountaineering, and free climbing also require rhythm and harmony. Research revealed that the participants of these sports had a deep relationship with nature, like dancers have with a dance (Brymer & Gray, 2009).

In judo, many coaches are looking for alternative ways to train athletes in rhythm. To make them understand and feel rhythm they are looking for solutions in different sports. This has led to many Brazilian coaches holding dance class on the mat or Greek coaches teaching folkdance to improve fast rhythm. After winning the gold medal in judo at the Barcelona Olympics, Toshihiko Koga began training in other sports than judo. He was three times gold medalist at judo world championship 1989-91-95 and won gold in the Olympic Games in Barcelona 1992 and silver in Atlanta 1996. Koga was head coach for the All-Japan judo women's national team and, because he realised the importance of also playing different sports, he was able to cultivate moves that he did not usually use in judo which, somehow, allowed athletes to instinctively find rhythm. Koga talked about "sense of rhythm and feeling rhythm" and started to study baseball squash, tennis and aerobics with music to train the motor nerves and improve his own rhythm. He found that, "When you are tired, you lose your ability to think and [you make] many simple mistakes, [which I have to correct there and then]." (Koga, 2019).

From research we know that rhythm in sports is a synthetic indicator of an athlete's ability (Li & Wen-bin, 2007). Rhythm training is an integral part of sport and research has shown that in education in general, rhythm in sport increases the progress and rhythmic capacity of the participants. However, there is another rhythm that we can learn about from history that is equally important in combat sports, and that is rhythm in combat.

2.5 Rhythm in Combat

Herodotus was an ancient Greek historian, traveller, and geographer of the 5th century BCE and is the founder of the science of history (Luce, 1997). His work is a

record of the history of the wars between the Greeks and the Persians (Mikalson, 2004). In his book "Herodotus and religion in the Persian Wars", Jon D Mikalson explains how Leonidas, the king of Sparta, armed with 300 soldiers broke the rhythm of 300,000 Persians in the narrow Pass of Thermopylae (Mikalson, 2010).

In combat sports today, athletes must know how to break an opponent's rhythm, something which is equally as important as knowing how to impose your own rhythm, for example, in Japan, judo practitioners learn rhythm at every stage of their judo training, during university they learn how to break an opponent's rhythm (Y. Kanamaru, personal communication, February 16, 2017). A similar idea was employed in the construction of Himeji castle in Japan for the purpose of defence. One of its most important defensive elements is the labyrinth of paths that lead in different directions in an attempt to confuse an enemy trying to penetrate the castle. The layout of the paths breaks their rhythm and forces them to slowdown.

The gates, baileys, and outer walls of the complex are organised so as to confuse an approaching force, causing it to travel in a spiral pattern around the complex on its way to the keep. In many cases, the castle walkways even turn back on themselves, greatly inhibiting navigation (Turnbull, 2011). For example, the actual distance from the Hishi gate to the main *daitenshu* keep is only 130 m (430 ft), but the path leading to it is much longer at 325 m. The passages are also steep and narrow, further inhibiting an easy entry (Ball & Brown, 2005).

Nao Fukumoto, a graduate of Tokai University, judo rank 3rd dan and Japanese national team member, also worked as a 'Princess' at Himeji Castle, welcoming visitors. She explained the link between the Himeji Castle strategy and judo. For defensive reasons, the first turn (on the left) before the main entrance was designed and constructed at 90 degrees, meaning that the enemy was forced to change rhythm when they slowed down. There are also paths that lead to dead ends and paths that cause the enemy army to be divided into two groups. This tactic can also be seen in judo where "first we break the opponent's rhythm and then confuse him by using combinations" in order to get at least waza-ari score (N. Fukumoto, personal communication, October 17, 2018).

In judo, using the sleeve and the lapel effectively can break an opponent's balance, this action is called *kuzushi* (breaking balance) and is another way for those

who have reached an advanced level to break their opponent's rhythm (Ohlenkamp, 2019). Rhythm in combat, as well as in sports, is used for various reasons, and different methods are employed depending on the sport and the situation. Experiments have been conducted in various martial arts to examine the effectiveness of learning proper body movement. The results suggest feedback and the training environments enable athletes to enjoy training (Takahata et al., 2004).

Syd Hoare, (2002) in his book Judo Strategies wrote: “Intelligence, courage, will, faith, boldness, perseverance, integrity, and spirit are the mental elements consist of judo combat”. According to Hoare, judo is a battle and the strategic elements are: deception and surprise, probabilities and statistics, boldness and opportunism, planning, information on the opponent and timing (Hoare, 2002). So, Hoare links timing to success in combat.

2.6 Rhythm in Judo

Rhythm can be described simply as repeated motion or action, such as a heartbeat (Minsky, 1982; Yeston, 1974). From the researcher’s point of view, and based on his experience, rhythm in judo is connected with the imposition of movement to create patterns for effective attack. In his book ‘Kodokan Judo: Throwing Technique’ Toshiro Daigo, 10th dan, mentioned that, “the important thing for getting the proper techniques is that you should do *randori* (free training) with rhythmical footwork (advancing and retreating) and body movements ” (Daigo, 2005).

Nowadays, judo is known to the world through dynamic images seen in the competition or even in training. The history of judo is one of the transformation of a martial art into a modern sport (Sato, 2013). The man most closely involved with that transformation, Jigoro Kano, dedicated his life to the education of Japanese youth, and combined tradition and modernity with the progress of the individual in the service of the community (Stevens, 2013; Watson, 2000, 2008). Indeed, the fundamental principle of judo has been described as harmonizing with the art of living and the rhythm of the natural laws (Cadot, 2019).

The term *samurai* means “one who serves” (Louis & Ito, 2008; Nowak, 2007) and it is around *samurai* that the history of martial arts is written. The beginnings of judo are closely related to the tradition of Japanese combat and life arts and the personality of Kano. In the book “Seven Samurai” the author mentioned, rhythm conveying samurai optimism and confidence, *go rin no sho,* or "The Book of Five Rings," by Miyamoto Musashi (1584 – 1645), is a fundamental samurai ideology. Every action had its own tempo and rhythm, and most of Musashi's work was based on the notions of rhythm and timing (Hanska, 2014).

Sport has peculiarities that stem from technical particularities and historical and cultural characteristics, and which ultimately affect development in their respective systems, environments and countries (Brouwers et al., 2015; Sotiriadou et al., 2014). Judo has its own characteristics, its own standards, and its own culture. Japanese judo is accepted as a model not only because of its results, but also for the way it developed. It is no coincidence that the European Judo Federation has as its motto, “Judo - more than sport” (Knaup, 2021).

Judo's real meaning can be defined as “a way to make the best use of both body and mind” (Kano, 2005; Shishida, 2010). In other words, it is through control of the various judo techniques that a practitioner learns how to use the mind and body more effectively in everyday life (Shishida, 2010). In addition, judo techniques allow even a person of small stature to subdue a much larger and stronger person - ‘softness overcomes hardness’, *ju yoku go wo seisu* (Ariyama et al., 2017). The term "Softness subdues Hardness" comes from the ancient Chinese classics (Lao Tzu's "Three Strategies"), and it means that flexibility triumphs over rigidity. The *waza* of Judo allow a smaller opponent to use his opponent's own strength to throw him spectacularly. The phrase "Softness subdues Hardness" is frequently used to describe this phenomena (*Ju yoku go wo seisu,* 2022).

Judo also teaches respect and cooperation, leading to the mutual benefit of both parties, the founder of judo, Jigoro Kano, expressed these notions with the terms "maximum efficiency" and "mutual benefit" (*seiryoku-zenyo* and *jita-kyoei*), (Miarka et al., 2011; Nakabayashi, 1964). Judo teachers and researchers have extensively mentioned its benefit to society and modern international sport (Goodger & Goodger, 1977; Hamaguchi, 2006).

From a philosophical perspective, Kano's motto *"jita-kyoei"*, meaning "mutual welfare and benefit" (Kodokan, 2017), is interesting with regards to how Kano taught students to avoid violence (Becker, 1982). Kano's idea can be dated to around 1910, a time in which *"seiryoku-zenyo"* meaning "maximum efficiency" (Kodokan, 2018), and *jita-kyoei,* became the slogan of the Kodokan, (Matsunami, 2017; Shishida, 2010). Kano believed that if political systems such as capitalism and socialism were based on *jita-kyoei,* it would be possible to develop a better economic framework for society (Stevens, 2013). However, it is also thought that the implementation of *seiryoku-zenyo* is very difficult to follow in all aspects of life where as *jita-kyoei* has a more practical application to society (Demiral, 2018; Demiral, 2016).

When training for judo, it is important to understand that in order to perfect technique one must first practice the fundamental principles in order for the body and mind to eventually learn to perform the technique automatically (Watanabe & Avakian, 2011). Judo is a way that enables physical, mental and social development, as well as enhancing talent and leadership skills (Demiral, 2016). One of the fundamental basic exercises is learning how to using feet and arms with balance, rhythm and harmony through *ukemi* (breakfalls), (Kano & Martínez-Villasante, 1989).

During the researcher's month-long visit to Tokai University in Japan in November 2018, for a coaching seminar on the subject of "coaching juniors", the instructor, Kenji Mitsumoto, analysed the three stages of the four directions of *ukemi* (breakfalls). Teaching *ushiro-ukemi* (backwards breakfall), Mitsumoto explained how a student's first contact with judo involves learning to control their body through rhythmical breakfall training.

Ukemi is not just about falling safely; it is about controlling your body as *uke;* "*Kata* and *ukemi* form the foundation for improvement in judo" (Kotani, 1970; Kotani et al., 1968). On the other hand, it is mentioned in the study of an analysis of the mechanical impacts on the body of the judo practitioner, that "initiatives should be taken to reduce the damage due to impact during judo training and competitions" (Piucco & dos Santos, 2011). In that study, the participants were throwing with *ippon-seoi-nage* (one-armed shoulder throw), however, competition and training are two different things. During training, such as during *nage-komi* (throwing practice), judo practitioners have the chance to learn how to employ *ukemi* correctly and minimise

the risk of injury. Mitsumoto explained that *randori* is not the same as competition as it does not involve the same intensity, therefore during training time "injuring yourself signifies an incorrect *ukemi* (K. Mitsumoto, personal communication, November 20, 2018).

The next stage for a beginner is learning the judo steps *suri-ashi* (steps for free sparring), which can be broken down further into *ayumi-ashi* (walking step), and the *tsugi-ashi* (following step), (*Suri-ashi (footwork)*, 2019). *Tai-sabaki* (body shifting/body control) refers to the way a judo practitioner changes direction when performing. There are four basic *tai-sabaki* directions: *Mae-sabaki* (forward), *ushiro-sabaki* (backward), *mae-mawari-sabaki* (front turn) and *ushiro-mawari-sabaki* (back turn), (Inokuma & Satō, 1986). All of these steps (*ayumi-ashi*, *tsugi-ashi*) and body movements (*tai-sabaki*) are a part of the ten-step methodology to approaching rhythm, Bountakis & Callan, (2017). In his book "My Study of Judo" (Koizumi, 1960), Gunji Koizumi, 7th *dan*, said, "the action to throw should be a continuous curved line" and in order to produce a reaction in the opponent the judo practitioner should use *tai-sabaki* and push or pull rhythmically in the opposite direction in a circular motion (Sacripanti, 2014).

The next step for the judo practitioner is to learn how to perform *kuzushi* (break balance), (Wood, 2013). *Kuzushi* is one of the phases of action during a throw and includes body management, rhythm and balance (Yiannakis, 2019). From a biomechanical perspective *kuzushi* is the most important element when throwing (Sacripanti, 2010). One of the main principles of *kuzushi* is to prevent an opponent attacking (Tomiki, 1956). It is effective in both attack and defence as it is "important for breaking an opponent's rhythm" (Ohlenkamp, 2019). After breaking an opponent's balance, the next phase is *"tsukuri"* (set-up to execute) and *"kake"* (execution of technique), (Kobayashi & Sharp, 2014). To ascertain the precise moment for an attack during a judo contest, a judo practitioner will try to unbalance their opponent by pushing and pulling, they will also try to control the distance and posture of their opponent as well, which will create the optimum timing for throwing an opponent (Inokuma & Satō, 1986).

For the purpose of research on motor tasks (judo skills) in 40 male judo players aged 19-25 years based in India, the following variables were selected:

kumikata (grip fighting), *kuzushi, tsukuri, kake,* control, rhythm, coupling, flow, amplitude, precision, velocity, power, and opponents landing largely on their backs. In their research, rhythm is referred to as a temporal dynamic sequence of partial motion (Shaw, 2010). Whilst visiting Wales as a guest coach, the Japanese national team coach Yusuke Kanamaru arrived 45 minutes early for each training session. When asked why he did this, he answered, “discipline in mind and body”. The same was true for the ancient Greeks. For them, reaching a high level of performance discipline was key in mind and body (Kavoura, 2016).

The researcher’s assistant coach in Wales, Nao Fukumoto, observed that, due to the fact that their bodies are less muscular, women in Japan perform *uchikomi* (repetitive training) in a different way to male judo practitioners in that they rely more on rhythmical motion as opposed to muscular strength (N. Fukumoto, personal communication, October 17, 2018). This falls in line with the discussion that female bodies can often be seen as often having less muscular strength than males, but as possessing both rhythm and flexibility (Lökman, 2010). *Uchikomi* is a drill that has as its goal the development of speed and rhythm (Takahashi, 2005). From a physiological point of view, both *uchikomi* and *nage-komi* (repetitive throwing) are helpful for the improvement of aerobic and anaerobic capabilities (Franchini et al., 2014).

While working with the researcher as assistant coach of Welsh National Team, Nao Fukumoto often mentioned the particularities of women's judo, especially in rhythmic training of judo practitioners from young beginner to elite player level. Fukumoto’s way of teaching focused on supple and natural body movement rather than strength, the reason for which was given as the result of the differences in the male and female body (Taylor, 2001). Even when techniques had only minor differences they were effective because, according to Fukumoto, “rhythmic training and the imposition of rhythm in the competitions are more important than muscle strength” (N. Fukumoto, personal communication, October 20, 2018). Literature shows that Japanese women's judo is based on results/medals is world first team, although Europe is prevailing in physique and strength, (Challis, 2017).

Nage-komi is considered a form of training. It can be executed one or several times with technical repetition and rhythm, with the aim of improving movement

execution and physical conditioning (speed, power, and strength), (Almansba et al., 2008). A study where *nage-komi* was used on a dummy revealed that there is an ideal moment to apply strength, temporal synchronisation of hands, and rhythm during throwing practice in order to achieve better performance (Nagata, 2015).

Generally, there are a further two elements in judo that should be considered in relation to rhythm, and it is during these two elements that athletes should include all elements of their training. Those elements are *uchikomi* and *randori*. As is apparent from literature, there are studies using *uchikomi*, *nage-komi*, and *randori* for specific tests such as the study of the physiological demands of judo, for example. These studies suggest that the rhythm in competition among international judo practitioners is higher and recommended specific adaptation with *uchikomi* and *randori* (Hernández-García et al., 2009).

According to Polevaia-Secareanu (2016), the need to include rhythm in judo practice is mentioned more frequently nowadays, since special attention must be paid to the rhythmic structure of technical and tactical actions of judo practitioners. With the aim of researching the effectiveness of rhythmic education and music used in the training process of judo practitioners, the researchers elaborated on an experimental judo programme that had been tested on some students at the University of Physical Education and Sports of Moldova (Polevaia-Secareanu, 2016).

The study also sought to determine the level of coordinated motor abilities of competitors in areas such as kinaesthetic differentiation, movement frequency, simple and selective reaction time (evoked by a visual or auditory stimulus), spatial orientation, visual-motor harmonization, rhythmisation, speed, accuracy and precision of movement and balance (Lech et al., 2011). Practical tests included balance, spatial orientation, differentiation, coordination of movement, tempo, rhythm abilities, rhythm and balance (Borisenko et al., 2015). Another study explains that the rectangular training matrix is a structuralised listing of the fulfilment tempo and the resistance force of partner (*uke*), and that knowledge (space), ability (space and tempo-rhythm), and skill (space, tempo-rhythm and power) are all built on the basis of the rectangular matrix method of optimal training (Arziutov et al., 2016).

2.6.1 Pedagogy

The word pedagogy is derived from the Greek παιδαγωγία (paidagogia), from *παιδαγωγός* (paidagogos), which is a synthesis of *ἄγω* (ágō), "I lead", and *παιδός* (paidos) "boy" (Miller, 2012). Previously, youngsters were escorted to and from school by the Greek pedagogue, who was the keeper rather than the teacher. Thus, many people perceived the term was related to teaching in primary schools, however, today we use the phrase to refer also to college and university (Hall, 1905).

According to Li, (2012) pedagogy is the theory and practice of learning, as well as how this process influences and is influenced by the social, political, and psychological growth of learners. This is most frequently understood as the study of how knowledge and skills are transmitted in an educational system. Pedagogy theories and practice differ widely due to the fact that they reflect many social, political, and cultural settings (Li, 2012).

Originally characterised as an art, pedagogy today refers to the study of teaching, pedagogy is about observing and refining one's skill as a teacher (Anderson, 2005). By taking into account learning theories, an awareness of students and their needs, as well as the backgrounds and interests of specific pupils, teachers' pedagogy impacts their decisions, actions, and instructional tactics (Shulman, 1987). The definition of "pedagogy" is hotly debated. The most popular definition is that it is the study or science of teaching (Murphy, 2003). In this sense, it is the methodology of education, exploring methods and techniques that can be applied to achieve educational goals as a methodology (Howell, 2012).

The dissemination of knowledge along with fostering abilities and moral qualities are some of the goals of pedagogy. They consist of supporting the student's intellectual and social development as well as psychomotor learning, focussing on developing appropriate emotional and practical characteristics (Marshall, 2006). Briefly, pedagogy describes the art and science of teaching students, it refers to the method of how teachers teach, in theory and in practice and to the study of teaching approaches and how they affect learners and how effectively they can help them develop skills (Simon et al., 2002).

Pereira et al., (2021) suggest that Pedagogy and training method are two sides of the same coin. Jigoro Kano (1932) mentioned many times the importance of judo as a ‘way’, with the aim for people to perfect themselves and contribute to society, pedagogy is the tool to create people with strong characters that will be useful for society. Warner & Kanamaru, (2018) mentioned, the teaching processes, or pedagogy used by judo teachers need to be based on rhythm.

2.7 Summary of Rhythm Section

It can be seen from the examples above that rhythm plays a major role in all aspects of our daily lives, as well in sport, motor rhythmic capability is the ability to give rhythm to the movements (Frassinelli et al., 2017). The human mind causes the body to synchronise and, according to research, one of the most effective ways to trigger neurogenesis, the birth of new brain cells, in adults is to exercise (*Adaptive Movement Patterns (AMP) Training for Mind-Body Performance*, 2018).

Training is one way to increase brain performance, increase self-regulation skills and control the mind and body in sport (Blumenstein et al., 2002). Training in judo is based on three basic methods, *kata* (formal exercises), *randori* (freestyle fighting), and *shiai* (matches), (Kudo, 1967). Practitioners should perform *uchikomi* and *randori* with rhythmical footwork - advancing and retreating, and with body movement. While, in various studies, researchers frequently mention rhythm, tempo and timing, very few of these studies reflect on how and why rhythm is important in judo. Research has yet to comprehensively analyse ways for coaches and athletes to develop rhythm in judo training in order to master judo technique effectively.

Over the last two years the researcher spent a great deal of time reviewing literature, starting with research into the basic keywords of judo, judo + training, and judo + history, (see Table 2).

Table 2

Keyword Research

Google Scholar (latest refresh 10/01/21)			**PubMed (latest refresh 10/01/21)**		
Search terms	Exclusion / Inclusion criteria	Hits	Search terms	Exclusion/ Inclusion criteria	Hits
Judo	Since 1964	66,600	Judo	all	3,542
In title: judo training	Since 1964	26,200	Judo + training	all	1,685
In title: judo training	Since 2015	18,500	In title: Judo training		23
In title: judo training	Since 2018	14,400	In title: Judo training	Past 10 years	15
In title: judo training	Since 2020	7,600	In title: Judo training	Past 5 years	11
In title: judo training	Since 2021	3,530			
Judo + history	Since 1964	21,400			
In text: judo world history Kano Olympics	Since 1964	934			

Some of the main authors who have published on judo rhythm are, J. Kano, T. Daigo, I. Inokuma, N. Sato, I. Okano, E. Franchini, A. Sacripanti and S. Sterkowicz, and a number of the best judo books written are by Jigoro Kano, founder of judo and director of the Japanese Ministry of Education from 1898 to 1901. Kano played a key role in establishing judo as part of the Japanese public-school program and everything we know about judo today stems from his books on Kodokan Judo.

There were other influential teachers such as T. Daigo, I. Inokuma, N. Sato and I. Okano, who also wrote about judo and covered rhythm in *tai-sabaki*, rhythm in *uchikomi* and rhythm in *randori* (Daigo, 2005; Inokuma & Satō, 1986; Okano, 2017).

More recently, researchers have explored other aspects of judo. E. Franchini researched judo-specific training from a physiological perspective (Franchini et al., 2014), and is considered to be one of the most prominent judo researchers today. A. Sacripanti and S. Sterkowicz, have completed very important research in the biomechanics field, as detailed in their publication ‘Biomechanics of *Kuzushi-Tsukuri* and Interaction in Competition’ (Sacripanti, 2010), and techniques frequently used during London Olympic 2012 judo tournaments (Sterkowicz et al., 2013). Both texts

reported the importance of *kuzushi* and a rhythmical approach to applying technique in competition.

The researcher has also published literature relating to rhythm in judo (Bountakis & Callan, 2017; Bountakis et al., 2018). This early exploration of the topic led to a deeper reflection on the topic and started to inform the direction of the study.

During a coach education programme in Japan, the author had the opportunity to work intensively with Kenji Mitsumoto. This experience allowed the researcher to reflect deeply on his understanding of rhythm and the connection as a tool for athletes' development.

2.7.1 Research questions

The overall question which this research seeks to answer is; how do high-level teachers understand the concept of rhythm in judo? In order to explore this the research acknowledges that judo is made up of three core tools for instruction or practice: *kata, randori*, and *shiai*. These three elements have not changed since Jigoro Kano created them. This is supported by Kudo, who claims that judo training is based on three basic methods: *kata, randori*, and *shiai*, in his book Judo in Action: Throwing Techniques (Kudo, 1967). Because those three basic training methods have remained unchanged, three subsidiary research questions connected to this study were developed:

1) *kata* stage (fundamentals); how do high-level teachers perceive the contribution of rhythm to the first steps of the practitioners?

2) *randori* stage (free training); how do high-level teachers evaluate the importance of rhythm in randori and its relationship in daily training?

3) *shiai* stage (contest); how do top-level players use rhythm for offence / defence?

2.8 Judo Section

This section takes into account two points, an overview of the academic literature related to the technical aspects of judo that underpins this research, and an overview of the technical steps of judo teaching from *ukemi* (beginners) to *shiai* (select players) based on the researcher's experience.

2.9 *Ukemi* (Breakfalls)

Literally, *ukemi* means ‘receiving the body’ so as to protect it.

Everyone who takes up judo understands the importance of falls, but what may not be understood are the multiple applications of falls in both sport and society in general. A child under the age of eight knows one thing very well, how to play games. If we use judo to educate them as a game, not only as a sport but as part of their education, we can apply the appropriate methodology in learning how to fall safely (Demiral, 2016).

Many club coaches worry that children at a young age might become bored easily through repetition of *ukemi*, however the use of games as a teaching tool might alleviate his boredom. Research that focused on two groups of boys aged seven and nine exercising when playing games over a period of nine consecutive months, proved that the children who were members of a judo group developed obvious skills such as coordination, speed and endurance (Sekulic et al., 2006). This research has investigated this idea further and looked at *ukemi* exercises used by Japanese expert coaches to improve various skills such as body control, rhythm, harmony of movements, time and strength during the early stages of judo training.

In 1966, the US judo federation brought Keiko Fukuda, Japan’s highest ranking woman judoka and who had studied directly under Jigoro Kano, to act as technical advisor for the women's national judo team. She demonstrated her art at Mills College, and the institution immediately offered her a teaching position. She accepted and taught there from 1967 to 1978. and is known for teaching *ukemi* with an emphasis on detail and harmony. Her personal motto was: "*tsuyoku, yasashiku,*

utsukushiku", meaning "be strong, be gentle, be beautiful, in mind, body, and spirit" (Fukuda, 2004). As a result of her teaching, women students started to develop *ukemi* and general judo skills faster, which resulted in them practicing more often and enjoying themselves and, as Kenji Ota mentioned in the interview, the number of women students increased the following term. According to Kenji Ota, safety is the main criterion for women deciding whether or not to continue with their judo/aikido training.

2.9.1 Safety through *ukemi*

Judo is known to be a dynamic sport where changes of rhythm are apparent during both competition and training (Sertić et al., 2009). Falls are a basic and integral part of daily practice whether it be the favourite technique of the athlete (*tokui-waza* combined with *nage-komi*), or in scheduled training (*yaku-soku-renshu)* that includes falls or randori and other exercises developed by coaches as a result of their own methodology. Falls are more intense and powerful among athletes at an advanced level so safety has to be paramount, and the ability of the athletes where falls are concerned depends on that safety (Fukuda et al., 2011). Thus, the importance of teaching falls to young athletes on a daily basis and increasing intensity in accordance with their age is an unbreakable rule.

This rule can also be applied on a daily basis for the children's physical integrity both in and out of the *dojo*. Teachers have reported that they have seen young children being pulled from behind in the playground while playing and badly injuring their face, teeth or nose. If they had received basic education on a front fall (Kim & Kim, 2004; *Mae-ukemi*, 2019), they would either have avoided injury or would have been better able to protect themselves. Similarly, if a child were to simply trip, *mae-mawari-ukemi* (front fall) could have helped reduce or even avoid the injury (*Mae-mawari-ukemi*, 2021). The European Judo Union has created two important projects to help promote a safer society. One concerns the teaching of falls at schools (EJU, 2019). and the other concerns research on falls in cooperation with universities (*Safe fall research project*, 2019). In judo training programmes, *ukemi* fundamentals,

physical activity and games are a part of play in a child's everyday life, and necessary for a healthy child development (Demiral, 2018).

There are many incidents involving pedestrians in the street, when someone falls over backwards after stepping on a plastic bottle, for example, and risks incurring a severe head injury. *Ushiro-ukemi* (back fall) is the symptomatic reaction in such cases (*Ushiro-ukemi*, 2019). A young human brain has the ability to understand the change of the rhythm in the body and, depending on the physical situation, the child will act impulsively simply through their sense of self-preservation (Pineda, 2005), for example if they fall over.

This instinct is a basic one and is an inherent characteristic of a person at the time of fear. But what happens with the elderly? Research concerning falls experienced at an older age shows devastating results. According to World Health Organization, unintentional injury deaths due to falls are the second greatest cause of death worldwide. Every year, an estimated 684 000 people die from falls around the world, with over 80% of these deaths occurring in low- and middle-income nations. Adults above the age of 60 are the ones that have the most deadly falls. Every year, 37.3 million falls are severe enough to necessitate medical attention. To reduce risk, prevention methods should prioritise education, training, and the creation of safer surroundings (WHO, 2019).

Every year, roughly 37.3 million falls serious enough to require medical attention occur worldwide, despite the fact that they are not fatal. Each year, falls cause nearly 38 million DALYs (disability-adjusted life years) to be lost globally, resulting in more years of impairment than transportation injuries, drowning, burns, and poisoning combined (WHO, 2019). Taking these statistics into consideration this seems to stem from a lack of education regarding falls. There are a small number of projects around the world where skilled judo coaches instruct the elderly how to fall and protect themselves. The World Health Organization researched the issue and although judo methods can be employed to help reduce injuries in those over the age of 65 offering preventive lessons, any courses are still in their infancy.

In Japan, a programme based on basic judo techniques was developed by Dr. Takeshi Kamitani, the official doctor for the Japanese Olympic judo squad. This workout regimen is designed to improve overall health and well-being, as well as to

protect elderly people from falling. Furthermore, practising basic falling skills from judo may result in less injuries from falls, such as hip, wrist, and other fractures (Sakuyama et al., 2021). Kamitani refers to his programme as the *Yawara chan* taiso, a combination of the diminutive label *'Yawara chan'* given to Ryoko Tani, the lightweight female judo champion who won five Olympic medals, and the word *taiso,* which in Japanese implies gymnastic exercises. It is an intervention with the potential to have a substantial impact on older people's ability to remain independent, productive, active, and socially connected for extended periods of time, and so addresses the problem of falling in a unique holistic manner (Lasuen, 2019). There are three sorts of exercises in the programme, standing exercises to enhance leg and hip strength, as well as balance and proprioception, falling techniques to help people learn to fall safely, and ground exercises to build core strength and ability to move on the floor and get back up after a fall. The exercises have the potential to reduce fear of falling by improving balance while walking, learning how to fall more safely if they do lose balance and fall, and finally giving them confidence in their ability to move on the ground and get back up after a fall in order to call for help or move to a safer location while waiting for help.

2.9.2 Body control through breakfalls

In judo, safety while learning falls is not only of benefit to a young child, it is also their first contact with body control. Educating a child on how to control their body through the mind, which in turn controls the muscles, comes through physical exercise. Neuroscientists assure us that these abilities are directly connected with a series of characteristics known as ‘performance function’, a group of skills which combine the knowledge of advanced level skills that evolved during childhood. Research has shown that the level of an infant's performance function is vital for his future progress (Case-Smith, 1996; Kim, 1992; Ste-Marie et al., 2012).

It has been proven that exercising offers children important benefits, and it is undeniable that exercising helps them develop their muscular system (Astrand et al., 2003; McArdle et al., 2006; Åstrand et al., 2003). Through exercise bones, muscles and joints get stronger. Children learn to control their body and movement. Judo plays

this exact role by teaching children how to fall by getting them to practice *ukemi* through a combination of exercises and falls aimed at improving control of their body (Sterkowicz-Przybycień et al., 2014). During the researcher's visit to Tokai University in November 2018, the coach Kenji Mitsumoto analysed the three stages of teaching of falls in four directions. He explained that a child's first contact with judo educates them about body control, rhythm and falls training saying that, characteristically, "falls are not only about falling safely, but are also about body control." (K. Mitsumoto, personal communication, November 20, 2018) He also found that "*kata* (forms) and *ukemi* (falls) are the fundamentals for improvement."

2.9.3 Partner role in developing rhythm

Another important element that must be focused on is the role of the partner. Finding a good partner, of high level, is difficult for many athletes and their coaches. As the researcher experienced while working as an Olympic Coach during the London 2012 Olympic Games there were times when male and female athletes were partnered with athletes from other countries during most of their Olympic training. Even in clubs, it is a common phenomenon for an athlete to try to develop his *tokui-waza* without having a partner of an appropriately good level and, in some cases, they don't have a partner at all. It is important at this stage to define the fundamentals which characterise a good partner. According to the national coach of Japan, Minoru Konegawa, who is responsible for the male categories -60 and -66kg, a good partner should be skilled in rhythm, harmony, and soft movements (M. Konegawa, personal communication, November 19, 2018).

Rhythm is an attempt to organise time in a complex movement (Kugler & Turvey, 2015). A judo practitioner's partner has to realise rhythm in order to either follow the trainee's rhythm (*tori*) or to provide rhythm. A partner without a rhythm cannot realise the tempo. The tempo is the speed performance of the movement (Λιάπα, 2004) and, depending on the exercise, it specifies how slow or fast the rhythm is". Harmony is the phenomenon which gives depth to movement (Μουρατίδης, 2019) and is connected with rhythm so as to have a rhythmically harmonic movement at such time as during an attack in a competition. Time (or

moment), the athlete has to be able to realise the timing for effective attack, during competition, for example. Therefore, in situation training, for instance, the partner should have the ability to understand when it is exactly the right moment to position his body, in the Japanese language this is known as '*bubun'*. Softness is combined with "the dynamic which specifies how hard or soft a movement is performed" (LaViers et al., 2011). At the time of exercising *uchikomi*, partner body position is of special importance. The partner's body has to be supple and move with harmonic movements. This also helps the trainee to improve their technique and their rhythm.

Both knowledge of the above and technique experience, are the most important fundamentals for a good level partner, specialising in falling brings positive benefits to training. The continuing rhythmic exercise of falls is key to the cooperation and progress of both athletes (*tori-uke*).

2.9.4 Rhythm and control, backwards fall *ushiro-ukemi*

In her book "Born for the mat", Keiko Fukuda noted that Shiro Saigo, one of Jigoro Kano's first students, was so knowledgeable about falling he landed on his feet after a fall no matter which way his opponent threw him. As a result, he acquired the nickname is '*neko*' (cat). His falls are connected with the way he cultivated his technique by specialising and gaining a thorough experience of them (Fukuda, 1973). In 1883 Jigoro Kano divided his students into two groups creating *yudansha* (graded students) and *mudansha* (ungraded students), Shiro Saigo and Tsunejiro Tomita were the first to be awarded the *yudansha* grade in that year and wear a black belt.

In 2018, during the Tokai University seminar for coaches, Kenji Mitsumoto explained that rhythm comes from *ushiro-ukemi.* He then elaborated by saying that the first step is for the athlete to lie on their back and then bring their legs to the stomach and hug them with both of their hands to form of a semicircle. Having achieved that position, the athlete should move their body rhythmically backwards and forwards like a pendulum. For the second step, the athlete should be able to stand up from that position and squat on their feet before softly and rhythmically repeating the same movement. Mitsumoto noted that the first time a beginner comes into contact with the concept of body control is when they learn *ushiro-ukemi.*

Ushiro-ukemi is used when the body falls backwards. In order to avoid damaging the head or the neck, the body should fall naturally and the athlete should quickly move their hands to strike the mat with strength in order to mitigate the impact of the body on the mat. At first, the athlete's chin is likely to remain in contact with their chest. The eyes have to focus on the stomach, while the legs can be raised to a point that doesn't exceed the height of the belt. The hands are in front of the rest of the body for a split second before hitting the mat and creating an angle of 30-45 degrees. A key point here is that immediately after impact the hands should be lifted from the mat. Failing to do so would result in vibrations to run through the body. When a judo practitioner falls onto the mat, "the more area of impact athlete has with the mat, the less damage athlete receives" (Glowiński et al., 2017).

2.9.5 Rhythm and dynamics, forward fall *mae-ukemi*

After *ushiro-ukemi* and the introduction to rhythm and control, the athlete moves on to body dynamics. This is taught through *mae-ukemi*. Its use in everyday life makes it of vital importance, especially for those at a young age. As mentioned earlier, children often push their classmates from behind to surprise them and this sometimes results in facial injuries. By using a forward fall, children are able to control their bodies dynamically and prevent facial injury. Research carried out in Korea looked at kinematic variables of *mae-ukemi* through the use of 3D image analysis (Kim & Kim, 2002), and showed the phases of the impact of the body on the mat. Other research revealed that the *mae-ukemi* can help the athlete prevent their head from hitting the ground if attacked from behind (Gzik et al., 2017).

According to Mitsumoto, the forward fall should be taught to the practitioner, the body should be relaxed, with no tension anywhere and the athlete should have total control. During the first steps of education, an athlete, regardless of age, should begin by falling softly forwards from the knees and without needing to stretch their feet. Mastering that will come with experience through time and training. When they hit the ground, their hands should be a split second ahead of the rest of the body and hit the mat just in front of the face in a position which forms two triangles. The first triangle starts at the two elbows and ends with the two palms of the hands facing the

face. The second triangle is created when the fingers on both hands are together and the thumbs apart. The distance between the fingers and thumb should exceed five centimeters. The athlete should ensure that their stomach not touch the mat, and the key point to be noted is that the face should be turned either to the right or left but parallel to the impact of the body on the mat (Takahashi, 2005).

2.9.6 Rhythm and synchronisation, side fall *yoko-ukemi*

Yoko-ukemi is perhaps the most common fall and the athlete should learn to perform it on both their right and left side. As in the two previous falls, relaxing the body and keeping it supple will result in synchronisation. Alternating repeatedly from right to left and vice-versa requires technical knowledge and synchronisation. Kim, Eui-Hwan & Kim, Sung-Sup designed a study to analyse the comparisons of the kinematic variables performing *yoko-ukemi* in three stages (Kim & Kim, 2004).

When teaching *yoko-ukemi*, Mitsumoto places great emphasis on the rhythm of the hands, feet, and hips. He believes that when an athlete falls to the right using this technique and strikes their right hand on the mat, the left palm must touch the right shoulder before the body turns to the left, in order to increase the speed of the arm movement. As these details are not found in judo literature or teaching DVDs, teachers with an extensive knowledge of judo education such as Mitsumoto have developed their own methodology by dividing up the technique and teaching it step by step. In addition, a study in Japan showed that school students learned *yoko-ukemi* faster and more safely through modern methodology rather than the traditional way of teaching the athlete to keep their eyes on the belt knot (Fujitani et al., 1990).

Landing on the side, with one hip on the ground, the body should be kept in a straight line with the legs falling in-line with the rest of the body. The left leg should be held straight, and the foot placed on the ground. The right leg should be bent a little at the knee, with the sole of the foot on the ground, and spread a short way from the right leg so that the knees cannot knock together. The left arm should impact the mat at the same time as the rest of the body at an angle of 30-40-degree angle from the body. The arm must remain perfectly straight. All judo falls aim to spread the impact over in a large area as possible. Ideally, the athlete should land with all of the

above body parts striking the ground and the left arm should slap hard on the mat upon impact in order to reduce the forces on upper body (Inokuma & Satō, 1986).

2.9.7 Harmony and perfection, forward roll *mae-mawari-ukemi*

From rhythm to control, from control to dynamics, from dynamics to synchronisation and from there to harmony and perfection; the completion of the *ukemi* learning process comes with training in *mae-mawari-ukemi.* In this move, all the details from the previous three falls, technique, rhythm, control, synchronisation, harmony, softness and natural movement are taken into account. Study shows that the judo training process is most complex in co-ordination and conditioning, and represents a set of simple movements linked in a certain sequence or performed synchronously (Yaneva, 2016). At this stage the athlete will have attained satisfactory levels of bodily control, safety both on and off the mat, and in their role of training partner.

Mae-mawari-ukemi is a rolling falls movement which has as its purpose the minimising of impact with the ground and allowing the athlete to roll easily back up onto their feet. This move is performed by first standing with the feet together, then squatting down so that only the soles of the feet are on the ground. The athlete then places their hands on the ground, palms down, in front of their legs. From there, they push off with their legs, tuck their heads down and roll from the hands directly onto the shoulders without the top of the head making contact with the ground. The roll continues with the back coming into contact with the ground and the athlete moving in a straight direction and ends with the athlete placing their feet on the floor and returning to a standing position. After practicing the basic front roll, the next step is to begin the move from a standing position. The teacher must encourage the student to develop *mae-mawari-ukemi* by immediately returning to their feet, which results in a smoother roll (Barbosa, 2018).

2.10 *Ashi-sabaki* (footwork)

After breakfalls, the students learn ways to move on the mat. Some coaches teach *ukemi* first and steps after, and others teach both at the same time. *Ashi-sabaki* is the study of the movement of the feet and legs. The way judo practitioners move on the mat is called *'suri-ashi'* (sliding/gliding) (*Suri-ashi (footwork)*, 2019). Athletes use the *suri-ashi* method to avoid lifting the legs too far from the mat. Two more of the basic stepping methods are *ayumi-ashi* (walking step) and *tsugi-ashi* (following step). Inokuma & Satō, (1986) state that both involve *suri-ashi*. The follow-up step (*tsugi-ashi*) is fundamental for many martial arts like boxing and fencing and consists of stepping with one leading foot. The alternated step (*ayumi-ashi*) is a normal step. Foot glides easily, without body weight in order for the foot to glide over and beyond the former with a rhythmic alternation of function and operation (Westbrook & Ratti, 2012).

Toshiro Daigo notes that *suri-ashi* is used together with *ayumi-ashi* and *tsugi-ashi* during *randori* and *shiai* (Daigo, 2005). From a biomechanical perspective, in his research Biomechanical Optimization of Judo, Attilio Sacripanti refers to the importance of *ayumi-ashi* and *tsugi-ashi* (Sacripanti, 2016). From a physiological perspective research has shown that judo appears to be beneficial for improving anthropometric and functional fitness variables. *Ayumi-ashi* and *tsugi-ashi* training does not affect human movement (Ciaccioni et al., 2019).

2.10.1 *Tai-sabaki* (body movement)

Literally, *tai-sabaki* means body shifting or body control.

Tai-sabaki means changing body position whilst maintaining a stable posture. The basis of a throwing technique lies in using changing body position to keep an opponent off balance (Croceri, 2014). Breaking down the word *tai-sabaki* into its two main components, Gleeson explains that *tai* means 'body' and *sabaku* means judge or assess the situation (Callan, 2018b).

The four basic directions of *tai-sabaki* are as follows:

Mae-sabaki, front movement with control, where the athlete shifts position by moving one foot forwards and withdrawing the other to the correct position.

Ushiro-sabaki, back movement with control, where an athlete shifts position by moving one foot backwards and pivots on the other in the right position.

Mae-mawari-sabaki, forwards turn with control, where an athlete shifts position by moving one foot diagonally in front of their opponent.

Ushiro-mawari-sabaki, backwards turn with control, where a contestant pulls an opponent forward while stepping back with one foot, and then spins around in front of the opponent with their back towards them (Inokuma & Satō, 1986).

2.10.2 Body control

Judo is a complex sport in which athletes try to overthrow their opponents and achieve the maximum score of ippon. To accomplish this, four things are needed: speed, force, control of the opponent, and for the opponent's back to touch the mat. This will allow the referee to immediately call the match.

Ippon will be given when a judo practitioner throws their opponent on their back, applying technique with considerable ability and maximum efficiency. "*Ikioi*" (momentum with both force and speed), "*Hazumi*" (skilfulness with impetus, sharpness, or rhythm). Definition of *ippon*: Speed, force, opponent landing on his back, skillful control until completion of the landing (IJF, 2017). So, we can see that the global authority for judo, the IJF, use the concept of rhythm inside their definition of *ippon*, which is the goal of every *judoka* during *randori* and *shiai*.

2.10.3 Body balance

Ashi-sabaki in combination with *tai-sabaki* plays a major role in a judo practitioner's balance. A study on Polish judo athletes revealed judo training to benefit body balance (Maśliński et al., 2017). Athletes in training and in competition are involved in situations during which they maintain contact with the mat with only

one leg and often in conditions of dynamic actions for both participants. The principle of judo is for the defender to mirror the attacker's movement or strength and use it against him. To do that effectively athletes need skills such as body control and balance.

2.10.4 Rhythmical movement

In daily life humans walk by alternating their weight between one foot and the other. For example, when the weight is on the left foot a human can release the right in order to step forward. Then, the weight of the body is shifted to the right in order for the left foot to be free and move forward again. In this way humans are able to maintain their balance through control of their centre of gravity and move in all directions (Στεφοπούλου & Τσάφα, 2013; Τσαταλάς et al., 2015). In judo, it's not the same. The whole body moves at the same time without the athlete losing the centre of gravity. Every time the athlete adjusts the centre of gravity in any direction it becomes an opportunity for the opponent to attack. The methodology of body movement in *tai-sabaki* teaches the judo practitioner to move using *shizentai* (natural position) so that minimal weight-shifting occurs.

Tai-sabaki is a generic term used for the moves needed to change directions for the creation and application of techniques and also for the process of responding to opponents' techniques (Kawamura & Daigo, 2000). In his book Mastering Judo, Masao Takahashi explains that enthusiast judo practitioners find the intensity of randori very appealing (Takahashi, 2005), and that *randori*, timing, rhythm, and fundamental body movements (*tai-sabaki*) are necessary elements in every day training. In addition, in his book "Throwing Techniques" (p.76), Toshiro Daigo, (2005) 10th dan, said that, the important thing for developing proper technique is for a judo practitioner to do *randori* with rhythmical footwork and body movement.

The link between rhythm and *tai-sabaki* is quite prominent and useful as a teaching tool, if a student is doing judo with stiff arms *tai-sabaki* can become very robotic. Professor David B. Waterhouse, a famous judo academic wrote *tai-sabaki* for the piano, *tai-sabaki* for the *tatami*, in a tribute to his teacher Muriel Denny (Tobin, 2004).

Ron Rogers wrote: “Each *tai-sabaki* form has its own rhythm”, which reflects the proper technique. Generally, slow movements reflect throws and fast movements are direct attacks. When responding to your opponent with *mawashi-ashi*, keep your lower abdomen in line with the opponent, as if you are dancing with them, so you are able to control them with your stomach (Rogers, 2008). By projecting training skills into daily activities, athletes discover how judo training is linked to balance, rhythm and harmony, perception, and kinetic feelings. In *ma-ai*, *hyoshi* and *yomi*, *ma-ai* is the relative distance between opponents, *hyoshi* is rhythm of action and yomi is the selection of the right moment. *Tai-sabaki* is linked with those three elements. In judo, athletes need to know when it’s the right time to move the body in order to be in a better position than their opponent (Desormeaux, 2019). “In judo, from ancient times, use of the spirit has always had the upper hand over use of bodily strength”. Kazuzo Kudo, 9th dan (Kudo, 1967).

2.11 The Three Phases of Throwing Techniques

2.11.1 *Kuzushi* (breaking balance) - phase one

Kuzushi is the Japanese word for the unbalancing of one’s opponent in judo (Kawamura & Daigo, 2000). It’s the process of putting an opponent in a position where their stability prevents them from being able to attack. In judo, this is considered an essential principle and the first of three stages in a successful throwing technique: *kuzushi* (breaking balance), *tsukuri* (fitting or entering) and *kake* (execution) (Kodokan, 1970).

Kuzushi is fundamental to many styles of Japanese martial arts, such as judo, *aikido*, *sumo*, *karate* etc. Effecting *kuzushi* depends on *ma-ai* (the distance between opponents) and other circumstances. It can be achieved using *tai-sabaki* - taking advantage of the action of the opponent (push when pulled, pull when pushed), or a combination of all three. It is obvious, even to someone who has never practiced judo, that a throw would be more effective when applied to an opponent who is in a weakened balance position.

A judo throw, effected without *kuzushi*, cannot be effective (Ishikawa & Draeger, 2011). The author's understanding is that the secret to a good judo technique is to find a way to catch an opponent off-balance. *Kuzushi* is often thought of as simply pushing or pulling but in more advanced levels it is much more than that. For example, *kuzushi* can also be achieved by breaking the opponent's rhythm, feigning attack, changing body position or changing tempo. *Kuzushi* should always break the opponent's concentration. Five forms of *kuzushi* can be found in *Itsutsu-no-kata* (Jones, 2016; Kodokan, 2019).

2.11.2 *Happo-no-kuzushi* (eight directions of breaking balance)

Happo means eight, no means of, and *kuzushi* means break balance. One method for controlling the movement of an opponent is performing *happo-no-kuzushi* in eight directions. The directions are front, back, right side, left side, right front diagonal, right back diagonal, left front diagonal, and left back diagonal (Nakabayashi, 1964; Stevens & Semple, 2012). From a biomechanical point of view, there are four sides and four diagonals and, when considering the human body, the centre of gravity is in the middle of the body on the mat. The body can be thought of as being on an axis. Scott (2019) mentioned, when the body revolves round this axis it revolves like a wheel around its hub. When a human body moves it will move in one of those eight directions (Watanabe & Avakian, 2011).

In his book "Judo in Action (Throwing Techniques)", Kazuzo Kudo explained the concept of *happo-no-kuzushi* (eight directions off-balance) and *jushiho-no-kuzushi* (fourteen directions off-balance). Kudo achieves this by dividing the front diagonal directions into three, and the back-diagonal directions into two. Kudo has outside right front and mid right front, and inside right front and right rear diagonal (Kudo, 1967).

Mr. Kanamaru mentions the concept of fourteen directions, during a seminar in Athens for Greek judo coaches in 2017, the well-known Japanese national team coach Yusuke Kanamaru explained the 360 degrees of *kuzushi* based on the definition of eight directions by Jigoro Kano, adding that a human can throw their opponent in any direction within 360 degrees. When asked for further details about the 360

degrees, Kanamaru explained that even if a judo practitioner hugged his opponent and lifted him up, once his feet were off the mat, it was *kuzushi* with direct *tsukuri* (Y. Kanamaru, personal communication, September 07, 2017).

2.11.3 *Hiki-dashi* (pulling out)

Hiki-dashi in judo terminology is considered to be a static pull (Ghetti, 2017). In the case of a right-handed judo practitioner, the body slides to the right with the right foot forward and the left behind (*migi-shizentai*). The practitioner then bends both knees and lifts their knees up with intensity and rhythmically and at a fast pace, while at the same time tugging on the sleeve with their right hand (*hikite*) and grasping the lapel with their left hand (*tsurite*) (Zaggelidis & Siopis, 2019). *Hiki-dashi* only involves pulling in three directions: right pull, left pull, and by pulling the opponent in front of the attacker's chest.

Isao Inokuma and Nobuyuki Sato wrote, *hiki-dashi* from *morote-seoi-nage* is good for throwing large opponents because it makes it easy to unbalance them (Inokuma & Satō, 1986). According to literature the *hiki-dashi* test shows positive correlation with physical fitness measures in judo practitioners (Del Vecchio et al., 2014; Miarka et al., 2016; Seihati A. Shiroma, 2019).

2.11.4 *Tsukuri* (set-up to execute technique) - phase two.

In order to find the right time to execute this technique during a competition, a competitor will attempt to destabilise their opponent by applying the "push if pulled" and "pull if pushed" principle to control distance from their opponent as well as control their opponent's posture. This creates conditions for properly throwing the opponent. These manipulations are called *tsukuri* (set-up to execute technique). Choosing the best possible *waza* (technique) for conditions created by *tsukuri* is referred to as *kake*, execution of techniques (Jones, 2018; *Tsukuri and Kake*, 2019).

Another use of *tsukuri* is in its role as a throwing preparation. To execute a perfect throw, the *tori* must bring his own body into a suitable position for throwing. Therefore, even before the tori has broken the *uke's* balance they should perform *kuzushi* to exploit the uke's instability. The *uke* will try by balancing movements or blocking to prevent falling, so the *tori* must move with rhythmically and with precision during the attack.

When the *uke* tries to free themself by stepping forward or pushing away from an unstable position, the *tori* must respond and dodge the defence action of the *uke*. By continual and rhythmical movement of their feet, the *tori* brings themselves into a better position to execute the throwing technique. This is caused by a lifting movement of the *tori's* arms with the help of his whole body. In case *tori* wants to perform a technique from an upright position he should lift the *uke*, the *tori* must manoeuvre their centre of gravity so that it lies underneath the *uke*. The reason being that if the *tori's* centre of gravity is under the *uke*, the *tori* will require less power to execute the throw (Kawaishi, 2019). Many teachers connect *tsukuri* with lifting movement, which basically it is. From every point of view, if the sole of the foot of the *tori* loses contact with the *tatami* mat it is already in phase two and one step before be throwing(Yamamoto & Fujii, 2019).

2.11.5 *Kake* (execution of techniques) - phase three

After *kuzushi* and *tsukuri*, this is the third phase of a throwing technique from a standing position (Imamura et al., 2006). Once the *uke* has been forced by the tori in the previous throw phases into a position of unbalance, the *kake* throwing technique is then used for the throwing the *uke* to the ground (Blais et al., 2007; Hassmann et al., 2010). If the *tori* has executed *kuzushi* and *tsukuri* optimally, the positive course of the technique is more of a result of the preceding actions (Tagusari et al., 2016).

The throw is the final stage of the *kake* phase. If the execution of the two preceding phases were performed well, the athlete should easily be able to follow through with *kake*. In the case of *seoi-nage*, the athlete pulls their opponent down with their hands to create his reaction and enters directly between the opponent's legs, and

rotates him during the throw (Almansba et al., 2008; Hassmann et al., 2011; Kim & Yoon, 2003; Mustafa, 2010).

The principle of *waza* is based on the fundamental principle of judo that is, 'maximum efficient use of mind and body'. The theories of *tsukuri* and *kake* are expressing this principle from the perspective of *waza*. Judo practitioners practicing *tsukuri* and *kake* both depend on the fundamental principle of 'mutual welfare and benefit' and 'maximum efficiency,' (Kodokan, 2016).

Kuzushi, tsukuri, and *kake* are considered to be the fundamental building blocks of *nage-waza* (Santos et al., 2014). *Kuzushi* and *tsukuri* are two aspects of the same movement, rather than separate movements (Sterkowicz et al., 2013). *Tsukuri* and kake (set-up to execute technique / execution of techniques) are two sides of the same coin. In judo, this is referred to as the 'method for using power'.

2.12 Learning Technique Phases

2.12.1 *Tachi-waza*

Since he created judo in 1882, Jigoro Kano continually developed his syllabus, 'gokyo no waza'. Later, in 1895, the Kodokan established an official syllabus, based on Kano's and revised in 1920 (Otaki & Draeger, 1983). The International Judo Federation (IJF) asked the All-Japan Judo Federation at 1995 to submit the official names of techniques (Kawamura & Daigo, 2000). This procedure was approved by IJF at the general meeting in 1995 (Daigo, 2005). Nowadays techniques are classified by the Kodokan into 68 *nage-waza* (throws) and 32 *katame-waza* (grappling techniques) since 2017 (IJF, 2020). The following 68 throwing techniques have been divided into five groups.

Te-waza (16 techniques), *Seoi-nage, Ippon-seoi-nage, Seoi-otoshi, Tai-otoshi, Kata-guruma, Sukui-nage, Obi-otoshi, Uki-otoshi, Sumi-otoshi, Yama-arashi, Obi-tori-gaeshi, Morote-gari, Kuchiki-taoshi, Kibisu-gaeshi, Uchi-mata-sukashi, Ko-uchi-gaeshi*

Koshi-waza (10 techniques), *Uki-goshi, O-goshi, Koshi-guruma, Tsurikomi-goshi, Sode-tsurikomi-goshi, Harai-goshi, Tsuri-goshi, Hane-goshi, Utsuri-goshi, Ushiro-goshi.*

Ashi-waza (21 techniques), *De-ashi-harai, Hiza-guruma, Sasae-tsurikomi-ashi, O-soto-gari, O-uchi-gari, Ko-soto-gari, Ko-uchi-gari, Okuri-ashi-harai, Uchi-mata, Ko-soto-gake, Ashi-guruma, Harai-tsurikomi-ashi, O-guruma, O-soto-guruma, O-soto-otoshi, Tsubame-gaeshi, O-soto-gaeshi, O-uchi-gaeshi, Hane-goshi-gaeshi, Harai-goshi-gaeshi, Uchi-mata-gaeshi*

Ma-sutemi-waza (5 techniques), *Tomoe-nage, Sumi-gaeshi, Hikikomi-gaeshi, Tawara-gaeshi, Ura-nage.*

Yoko-sutemi-waza (16 techniques), *Yoko-otoshi, Tani-otoshi, Hane-makikomi, Soto-makikomi, Uchi-makikomi, Uki-waza, Yoko-wakare, Yoko-guruma, Yoko-gake, Daki-wakare, O-soto-makikomi, Uchi-mata-makikomi, Harai-makikomi, Ko-uchi-makikomi, Kani-basami* and *Kawazu-gake** a prohibited *waza.*

2.12.2 *Katame-waza*

The following 32 ground techniques have been divided into three groups.

Osaekomi-waza (10 techniques), *Kesa-gatame, Kuzure-kesa-gatame, Ushiro-kesa-gatame, Kata-gatame, Kami-shiho-gatame, Kuzure-kami-shiho-gatame, Yoko-shiho-gatame, Tate-shiho-gatame, Uki-gatame, Ura-gatame.*

Shime-waza (12 techniques), *Nami-juji-jime, Gyaku-juji-jime, Kata-juji-jime, Hadaka-jime, Okuri-eri-jime, Kataha-jime, Katate-jime, Ryote-jime, Sode-guruma-jime, Tsukkomi-jime, Sankaku-jime* and *Do-jime** a prohibited waza

Kansetsu-waza (10 techniques), *Ude-garami, Ude-hishigi-juji-gatame, Ude-hishigi-ude-gatame, Ude-hishigi-hiza-gatame, Ude-hishigi-waki-gatame, Ude-hishigi-hara-gatame, Ude-hishigi-ashi-gatame, Ude-hishigi-te-gatame, Ude-hishigi-sankaku-gatame* and *Ashi-garami** a prohibited *waza.*

2.12.3 *Kata* (forms)

Kata is the expression of Japanese spirit and art. It is closely connected with daily activities through things such as etiquette and is a part of Japanese culture. Discipline is a classical way to find harmony, softness, and timing in Japanese traditional art forms (Otaki & Draeger, 1983). The value of practicing *kata* is in applying those techniques to *randori* and *shiai. Nage-no-kata* and *katame-no-kata* are also known by the term *randori-no-kata*. *Kata* is the correct tool for learning judo theory (Callan, 2018b; Yamashita, 1993). There are three principal ways of practicing judo and they are *kata* and *randori* and *shiai*. *Kata,* which literally means form, is performed by following a formal system of arranged exercise. *Randori,* is practiced freely, and *shiai* is a contest. Through *kata* practice, judo practitioners learn the principle of technique, harmony and throwing time. There are eight different forms:

1. *Nage-no-kata* (forms of throwing) - Three representative techniques are chosen from *te-waza, koshi-waza, ashi-waza, ma-sutemi-waza* and *yoko-sutemi-waza.*

2. *Katame-no-kata* (forms of holding) - Five model techniques are chosen from *osaekomi-waza, shime-waza* and *kansetsu-waza*.

3. *Kime-no-kata* (forms of decisive techniques) - Techniques for serious combative fight.

4. *Ju-no-Kata* (forms of gentleness and flexibility) - Gymnastic structure of the methods of attack and defence in a series of slow and moderate actions.

5. Kodokan *goshin-jutsu* (forms of self-defence) - This consists of an unarmed section and a weapons section.

6. *Itsutsu-no-kata* (five forms) - Forms which express the process of attack and defence. It consists of a series of five movements that artistically express the power of nature.

7. *Koshiki-no-kata* (classic forms) - Jigoro Kano highly regarded the forms of *kito-ryu jujutsu* as they represent the essence of attack and defence.

8. *Seiryoku-zenyo-kokumin-taiiku* (forms of maximum efficiency) - Includes both physical education and martial arts and are also forms of attack and defence (Kodokan, 2019; Kotani, 1970; 嘉納治五郎, 2005).

2.13 Fight Preparation Phases

2.13.1 *Hokyo* (extra support training)

In Japan, this training method is used for two main reasons, it forms part of the warm-up at the beginning of a session and it is used to give extra exercises at the end of a session. The *hokyo* is mainly divided into two groups of exercises - standing and ground exercises. Some of the ground exercises are: sit through, pull through, shrimp, reverse shrimp, side shuffle, side jump, foot contact (Kanamaru, 2019). During his time as the Welsh coach, the researcher performed this exercise under the supervision of Japanese the assistant coach, Nao Fukumoto, on a daily basis. This drill is specifically used for balance, control, flexibility, specific judo power and specific judo stamina.

In 2017, Fukumoto and the researcher in his capacity as Welsh coach visited double world-champion Uta Abe's school judo team to jointly train some female Welsh judo practitioners. During the warm-up they performed *hokyo* drills for over one hour and though everyone was tired there were still two more hours of training to complete. When asked why they do one hour of warm up and one more hour of *hokyo*? Fukumoto answered that firstly, to learn it for specialised body position plus techniques and secondly, athletes get physically tired and as a result will start to use the mind and not just rely on muscle strength. In *uchikomi* and *randori* athletes always rely on the brain and rhythm (N. Fukumoto, personal communication, August 22, 2017).

2.13.2 *Tandoku-renshu* (solo practice)

When starting to perform exercises like *tandoku-renshu* (solo practice), athletes will have reached a level where they fully understand the fundamentals of judo (Dulgheru, 2015). This phase provides an understanding of the starting position and the ending position, and is one way to train control, driving (during throw), timing, rhythm, perfection of the technique and the importance of stability. *Tandoku-renshu,* is a clear example of putting theory into practice, that is to say *randori* followed by *shiai* (Warner & Kanamaru, 2018).

2.13.3 *Uchikomi* (repetition training)

Though *uchikomi* is a term used in judo, it is actually borrowed from kendo (Token, 2019). In judo it is used to refer to the repetitive practice of 'manipulating the body to the point' where the throw can actually be executed (simulation stops at that point). *Uchikomi* is used as a warm-up before *randori* and contest, in training it can be practiced alone by wrapping a belt around a pillar and holding it at both ends. When *uchikomi* training is performed by two people, the *tori* executing the technique will continuously and rhythmically repeat moves and the *uke* will receive the tori's attack, this procedure simulates the feeling of an actual fight (Token, 2019). Where three people perform *uchikomi,* two of them play the role of the uke in order to increase the load on the *tori* and in order to push the *tori* to apply more force while they perform the throw (*Kakari-geiko,* 2019).

Literature is clear where the benefits of *uchikomi* training are concerned, and this is probably due to the fact that most judo teachers accept *uchikomi* training as being beneficial for the development of judo skills. It is common belief that practice *uchikomi* improves throwing skills. However, G.R. Gleeson, (1967) in his book "Judo for the West", openly argues against *uchikomi* training, pointing out that *uchikomi* is not realistic because it is static and fails to simulate fight conditions. He also states that *uchikomi* practice may help to increase stamina and strength but its value as a method for improve throwing skills are virtually nil (Gleeson, 1967). However, in

their book “The Judo Textbook in Practical Application”, Hayward Nishioka and James West (1979) share a different point of view. They mention that in Japan it is not surprising for young students to perform one to two hundred *uchikomi* daily and state that “by doing *uchikomi* drills, you one day find in practice that you’ve thrown your opponent and you have to stop and ask yourself how he got down there” (Nishioka, 2000).

Japanese judo champions have proven *uchikomi* to be one of the most progressive and practical methods of developing proper and powerful techniques (Ishikawa & Draeger, 2011). In his book "Judo Foundations: Basic Principles of Judo that all Judokas Should Know", Miguel López, (2013), states that the more *uchikomi* an athlete does, the better they will become. The main purpose of *uchikomi* is to increase technical ability, it can also be used as specific physical-conditioning and practiced to develop power and aerobic conditioning. In the opinion of the researcher *uchikomi* is an exercise that no serious judo practitioner should ignore.

2.13.4 *Nage-komi* (application for throwing)

Nage-komi is considered to be a specialised training method used to drive an opponent from an upright position to lying flat on their back on the mat, if the attacker achieves this in *shiai*, the referee will award them *ippon* (highest score) (IJF, 2020). For example, if a player practices *uchikomi* with *seoi-nage*, they will perfect the technique of simulating throwing their opponent over their shoulder. Where weight training is used to improve strength, so *nage-komi* is used to improve throwing skills in judo (Franchini et al., 2014)**.** The definition of *ippon* is: *ikioi,* momentum with both force and speed and *hazumi,* skilfulness with skilfulness with impetus, sharpness or rhythm (IJF, 2020). Neil Adams, one of the greatest judo practitioners in Great Britain, remarked, “Perhaps nowadays there is a little too much emphasis placed upon physical preparation and conditioning, and not enough energy is devoted to develop rhythm, balance, timing, proper positioning, and the use of your opponent’s reactions” (Seisenbacher & Kerr, 1991).

From a physiological perspective, *nage-komi* (repetitive throwing training) can also be used to improve aerobic and anaerobic fitness (Franchini & Takito, 2014).

One of the best judo practitioners in the -48kg class at Tsukuba University, 25 year-old Endo Hiroko (4th dan), who is an active player with excellent results both in Japan and abroad, and who won the Kodokan Cup and World Masters in 2013, noted that, “in *nage-no-kata* (forms) *nage-komi* teaches athletes driving and timing of every technique, and related with attacking timing” (E. Hiroko, personal communication, November 22, 2018), *nage-komi* is important for letting players learn how to complete the throw.

From safety point of view, an interview in “Aikido Today Magazine”, (March/April 2000 edition), the Japanese aikido-judo and dance teacher, Kenji Ota, who teaches aikido and judo to women students at the University of Santa Barbara, California, said that he found that women in general wouldn't do *nage-komi* before they had learned how to execute *ukemi* safely (Ota, 2019).

2.13.5 *Yakusoku-geiko* (agreed-upon practice)

The next stage of the preparation phases for a fight is *yakusoku-geiko*. During this period of training experienced athletes can also perform *kakari, bunun* and *randori. Yakusoku* literally means “promise”, so the targets to be achieved are already decided. *Yakusoku-geiko* is a general term for training in which the practitioners know what targets should be reached. As Otaki & Drager (1983) mentioned, teachers also call it ‘pre-arranged free practice drills.’ In this type of training, the combination of *uke-tori* should be relaxed and use no more than 50-60% of intensity with harmony, softness, timing, and rhythm (*Yakusoku-geiko* 2022).

2.13.6 *Kakari-geiko* (continuous attack practice)

Kakari-geiko is a fundamental drill used to perfect a technique during attack. The *tori* executes their technique against one or a number of uke who receive the technique in turn. This training method is part of a group that includes *yakusoku-geiko* (agreed-upon practice), *sute-geiko* (freestyle practice), (*Sute-geiko*, 2021)` and *butsukari-geiko* (collision practice), (BarboȘ et al., 2017). The *uke* and *tori* may either

swap roles, or one person may continue performing all the throws. *Kakari-geiko* in Japan is used also as a warm-up before a contest (*Kakari-geiko*, 2019). It is also called stress training and can be used for fitness training for either the *tori* or the *uke*. The *tori* can either execute a pre-arranged throwing technique, or simply attack one or a number of *uke,* who are moving at a fast tempo.

2.13.7 *Bunun-renshu* (situation training)

One training method Kazuzo Kudo (1967) recommends in his book "Judo in Action", is situation training (Kudo, 1967). However, Neil Adams recommends different types of situation training, which require a training partner to recreate or follow a situation such as one where a player grips with a high overhand, or a *kenka-yotsu* (against the opposite sided grip) stance (Adams, 2015). Boxers have been using this concept for years with sparring partners. The same thing occurs in judo where coaches analyse the opponents and then based on their analysis, they design scenarios for use in training athletes. *Bunun-renshu* is a training method to design training situations and strategies close to real competition (Courel et al., 2014).

During the 2012 London Olympic games, the researcher analysed 32 women in the -57kg category and designed scenarios for the top ten qualified athletes in the Olympic ranking list in order to create *bunun-renshu* drills for an athletes he was coaching in that category. Mr Kanamaru mentioned, "*bunun-renshu* is situation training but it is not official terminology, recently many Japanese often use it" (Y. Kanamaru, personal communication, December 30, 2021).

2.13.8 *Randori* (freestyle training)

Keiko Fukuda, the highest graded female judoka of all time, wrote, *"I come to the awareness that the essence of "ju" is the foundation of randori and every kata."* and explains the importance of the steps and kata (forms) on *randori* (Fukuda, 2004).

Randori is emphasised in judo pedagogy; this phrase encompasses a range of styles of practise, and the intensity with which it is carried out varies depending on the participants' goal and level of competence. At one extreme is *yakusoku-geiko* a docile type of *randori* in which neither player resists their partner's attempts to throw. *Sute-geiko* (throw-away practise) is a similar notion in which an experienced judoka lets himself to be tossed by his less-experienced partner. The hard style of *randori,* which aims to mimic the style of judo seen in competition, is the polar opposite of *yakusoku-geiko.* Hard *randori* is the cornerstone of judo.

Appearing on a coaching video by Fighting Films, Olympic and triple world champion Jeon Ki-Young talks about the importance of *randori.* He noted that in South Korea, judo practitioners do ten randori in every session, and in Japan they do daily *motodachi* (no rest), (本多壮太郎, 2007). By training in *randori,* judo practitioners learn how to execute a throw against a resisting opponent, gripping situations, and different stances. As Jeon explains, during *randori* players can try different techniques and combinations in simulated conditions. Without *randori,* players would never develop good fighting skills. One of the *randori* targets is to learn how to apply *tokui-waza*. Rooksby et al. (2014) state, "*randori* is one implementation format" (Rooksby et al., 2014).

Saburo Matsushita & Warwick Stepto (1961) suggest three types of *randori* with three different types of judo practitioners. Firstly, athletes should partner and practice with other athletes of a lower level and should focus on how to throw new techniques or develop secondary techniques. They should also try new combination techniques or opposite-side throws, but they should never practice *tokui-waza* with beginners. Secondly, athletes should partner and practice with other athletes of a similar level. Their first tendency is to let the practice develop into a contest, but 'there are no winners or losers in *randori*' ((Ohlenkamp, 2020). They must not adopt a defensive posture which might be justified in a contest, but attack with their best throws, and as strongly and as quickly as possible. Thirdly, athletes should partner and practice with other athletes of a higher level, Ohlenkamp supports this with the advice; 'find partners who are better than you'. In general, they should attack continuously, and refrain from waiting for a higher level athlete to attack (Matsushita & Stepto, 1961).

The researcher's experience supports this three-stage approach to pedagogy. Some of the most common tips that teachers give their athletes during *randori* sessions are:, 'judo practitioners should focus on the time of attack to develop their throwing skills', 'relax the body and mind', 'keep arms loose and focus on the moment of attack', 'finish the throw', 'follow-up each technique with another repeatedly', try new ideas', 'use *kiai* (shouts) for extra power', 'keep breathing under control', 'keep the elbows close to the body where they are more powerful', 'always face your opponent', 'do not let the legs cross', 'get a grip first', 'learn to feel your partner's intentions and anticipate their attacks', 'keep your head up and centred over your hips', 'focus on *kuzushi* to create opportunities for attacks', 'keep in mind the principle of mutual welfare and benefit', 'learn to control body, emotion, and mind', and 'hold on your rhythm' (Ohlenkamp, 2020). "In judo, as in all things, we must practice and use our heads to devise better ways of doing things "– Kazuzo Kudo, 9th dan (JudoInfo, 2022; Kudo, 1967).

2.13.9 *Shiai* (judo contest)

2.13.9.1 History of competitive judo

Shiai is a crucial component in judo. The first formal set of judo contest rules was drawn up in 1899, when Jigoro Kano was requested to chair a committee of the Dai Nippon Butoku Kai to draught them. Dai Nippon Butoku Kai, founded in 1895 in Kyoto, was a martial arts group with substantial links to the Japanese government during WWII (Bennett, 2013). These regulations were created to cover competitions between traditional *ju-jutsu* schools as well as Kodokan judo practitioners. The contests lasted 15 minutes and were evaluated on *nage-waza* and *katame-waza.* Wins were awarded in one of the following ways: by throwing, where the opponent's back strikes flat onto the mat with sufficient force, by pinning them on their back for a "sufficient" amount of time, or by submission, which could be achieved through *shime-waza* or *kansetsu-waza*, in which the opponent was forced to give up or summon a referee's or corner-stoppage. judge's (Hoare, 2005). In 1900, these rules were adopted by the Kodokan with amendments made to prohibit all joint locks for

kyu grades and added wrist locks to the prohibited *kansetsu-waza* for dan grades. In 1916, additional rulings were brought into further limit *kansetsu-waza* with the prohibition of *ashi-garami* and neck locks, as well as *do jime*. These were further added to in 1925 (Hoare, 2005).

Jigoro Kano had desired for judo to be included in the Olympic Games for a long time, and the first time it was seen in the Games was in an informal demonstration organised by Kano at the 1932 Games (Majumdar & Collins, 2013).

The IOC members formally resolved to add judo among the events to be competed at the Olympic Games during the 57th general assembly of the International Olympic Committee, held in Rome on August 22, 1960. The Japanese delegation's suggestion, which was presented to the session, was warmly received by all attendees. The few opponents were opposed to extending the number of Olympic events in general, not to judo specifically. In the end, just two votes were cast in opposition. A traditional Japanese sport has been featured in the Olympic tournament for the first time in history (Takahashi, 2005). Finally, in the 1964 Tokyo Olympics, judo became an Olympic sport for men for the first time (Mitoshi, 1964). The women's event was first presented as a demonstration event at the 1988 Olympics, and then as an actual medal event in 1992 (Callan & Bradić, 2018; Sato, 2013).

2.13.9.2 The types of shiai

One of the skills that judo practitioners gain is the capacity to put what they've learned to the test. *Shiai* is a unique experience that is required in order to get the full benefits of judo, judo athletes are put to the test against athletes that aren't usually seen in their *dojo*. *Shiai* is the reality of trying out new tactics and getting results that aren't what they are used to in *randori.*

One very interesting competition system called *kohaku-shiai* (contest between the red and white) is an annual event at Kodokan. The *kohaku-shiai,* which began in 1884 and is currently the world's oldest competitive judo event. There were no weight or time limitations at the original *kohaku-shiai*. From lightest to heavy, competitors

queued up. The winner of this event was determined using the winner stays up method (Morris, 2005).

Other competition methods, such as the *soatari-shiai* (round-robin tournament), provide for one of the most precise picks of a winner and place winners. It is best suited to individual competition rather than team contests in which all candidates have competed against each other. Another form of contest approach is the *koten-shiai* (big point tournament), which is when the first pair compete and the winner stays out. If there is a draw, both athletes stop and the next pair continue. At the end of the day, the individual with the most wins is the victor. This system is best used for individual assessments rather than team competitions. *Tentori-shiai* (single elimination) is a popular man-to-man tournament format used in both individual and team competitions, whereby the athletes compete with the opposite from the other team. This system continues in the IJF mixed team events, with the athletes competing within their weight category. The *kachinuki-shiai* (winner continue) is one of the most popular judo contest methods in Japan, particularly in High Schools and Universities. The teams face each other, and the first athletes compete, with the winner staying out to face the next athlete. This can result in a whole team being defeated by one athlete.

The *shinkyu-shiai* (kyu promotional tournament) competitions assess the contest fitness of kyu judo students who are recommended for progression in rank. Each dojo's *tsukinami-shiai* (monthly tournament) is normally a closed event, often used for dan grade promotions. Lastly a form of contest known as *ippon-shobu* (one point match) or *nihon-shobu* (two point match) are used in training to encourage athletes to try to score (Ishikawa & Draeger, 2011).

The IJF events include many different types of competitions: Grand Prix, Grand Slam, Masters, World Championships Cadets, Juniors, Seniors and Open normally consist of two sessions, the preliminaries and the final block. The competition phases that take place in the sessions depend on the type of event. Direct Knockout is a single-elimination format with no repechage, in which the losers of the semifinals are awarded bronze medals. Quarter-final Repechage, with this system the athletes will be divided into two tables by a draw, and an elimination system will be used to emerge two finalists, who will compete for the gold medal, The athletes

defeated in the quarter-final will compete in two repechage contests. In Double Repechage the athletes will be divided into two tables by a draw, and an elimination system will be used to emerge two finalists, who will compete in the final. Athletes who lost to the four semifinalists compete in the two repechage pools. The full repechage system allows all participants to compete at least twice, the athletes are divided into two tables (pools), A and B, with a draw and then in two teams (sub-pools) and Round Robin if there are low participation numbers, this is defined as a system where each athlete or team will compete against the other (IJF, 2020).

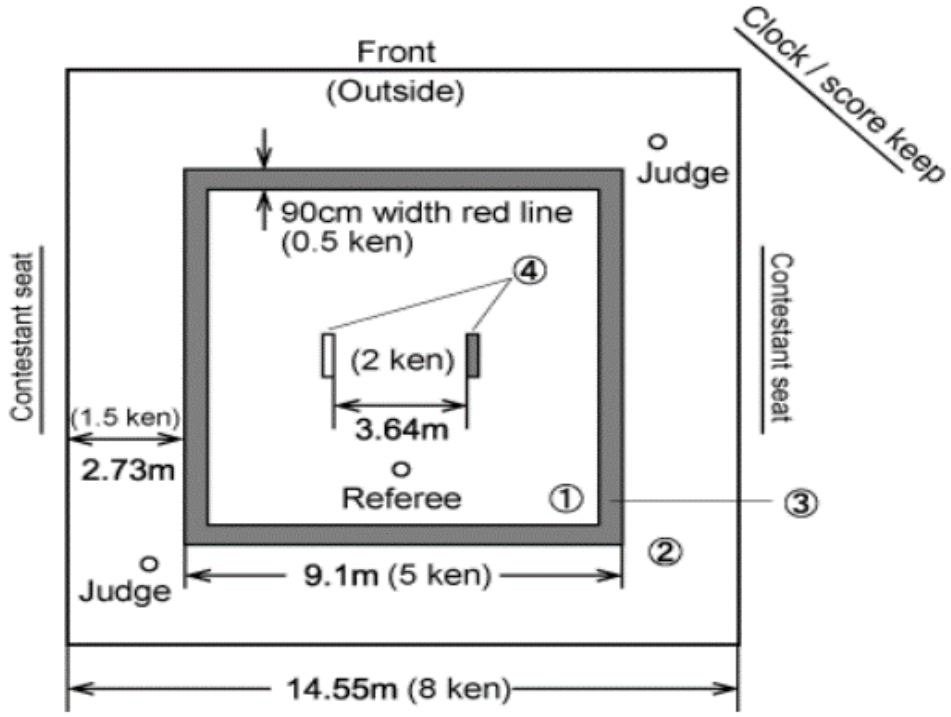
2.13.9.3 Contest area

The dimensions of the contest area have changed over the years, however, various nations have distinct regulations for different ages, such as children's judo. Kodokan rules in the past were followed by all federations, today, Kodokan events keep the traditional way and the All-Japan Judo Federation follows IJF rules.

By the Kodokan rules, the official contest area is 14.55m by 14.55m, with a 9.1m x 9.1m square in the middle. *M*ats (2.73m wide) are put around the perimeter of the contest arena. A red line (square) measuring 90cm in width marks the contest area limit. Two short lines of tape designate the locations where the two participants will stand to execute their "rei" in the contest area's centre (bows). The two lines are approximately 5 cm broad, 30 cm long, and 3.64 metres apart. The lines are red on one side and white on the other. The red line is on the right, while the white line is on the left, as viewed from the front (see Figure 1) (*Judo Fundamentals Kodokan Basic Rules*, 2022).

Figure 1

Tatami Layout at Kodokan Events



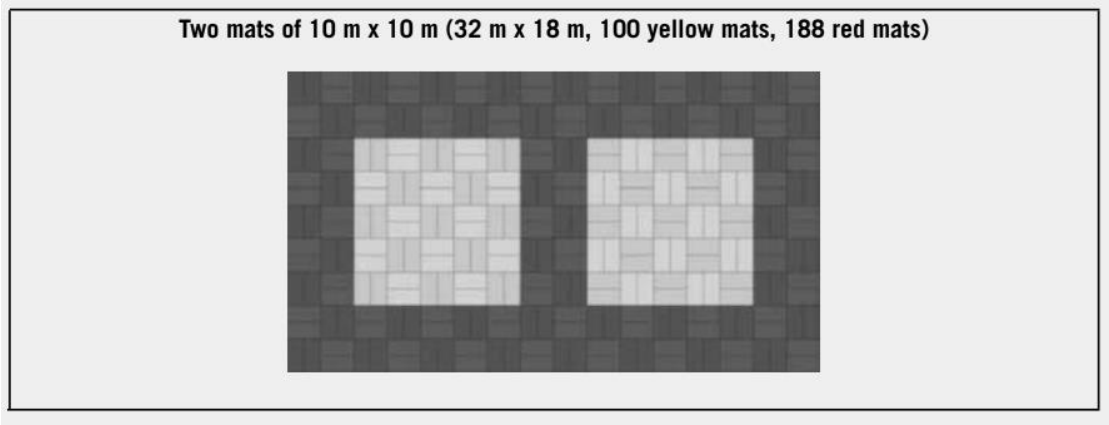
Note. Adapted from *Token* web page, judo competitions in accordance with the Kodokan

https://www.judo-ch.jp/english/knowledge/rule/

Official IJF competitions, including the Olympics and world championships, are held in a 10m-by-10m contest area. Where there is an adjacent contest area, a 4-meter safety zone shall exist between the two contest zones (see Figure 2) (IJF, 2019, 2020).

Figure 2

Tatami Layout at IJF Events



Note. Adapted from International Judo Federation web page. Sport and Organisation Rules, p136,

https://78884ca60822a34fb0e6082b8fd5551e97bc65e327988b444396.ssl.cf3.rackcdn.com/up/2022/03/IJF_Sport_and_Organisation_Rul-1646858825.pdf

2.14 Chapter Conclusion

As can be seen from the evidence provided above, learning *ukemi* not only promotes safety on the mat, it is also beneficial in everyday life. Moreover, literature reveals that *ukemi* can help a human prevent injury when they fall down (徳田 et al., 1976). During throwing training, the judo term '*jita-kyoei'* (prosperity and mutual benefit) should be emphasised in order to provide greater safety to the opponent (Melo et al., 2009).

From an historical perspective, there is evidence to suggest that landing on one's feet is not unorthodox, Geof Gleeson (1987), openly questioned *ukemi, kata, uchikomi* that are more associated with traditional judo.

After Kano, Kyuzo Mifune is widely regarded as being the greatest judo technician of all time. Mifune, 10th dan, had the reputation of being impossible to be thrown on the mat. He could be lifted up but throwing him was a different story, some of the aerial contortions he performed weren't from traditional *ukemi* (Lafon, 2002). A study showed that nowadays technology can be employed to improve *ukemi*, it concluded that use of computers and video could improve students' skills (南谷直利 et al., 2004). Kazuzo Kudo, 9th dan stated that, "the basic element in judo practitioners is the ability to fall, a man with skills at the techniques is also skilful at falling, and a man skilful at falling is sure to make great progress" (Kudo, 1967).

Footwork, body movement, body control and balance, rhythm are equally important to judo and they all play a major role. It is surprising that there is no research on the topic of rhythm in judo, and that it is solely something mentioned in books mainly written by Japanese judo teachers. According to literature, there not enough research about rhythm in judo, as such, more research needs to be done on this topic. In 2018, when the researcher visited Japan, he came across a situation involving daily training that seemed unique to him but one that appeared to be standard for Japanese. In a girls' college there was a motto on the wall which read, "pressure, rhythm, smile" and the whole training session revolved around this motto. For the researcher, this training session was one more piece of evidence to conclude that rhythm in judo is an important topic of research.

Drills like *hokyo, tandoku-renshu, yakusoku-geiko, kakari-geiko* and *bunun-renshu* which are specifically aimed at the preparation of mind and body, are purely related to rhythm. All these drills relate to foot movement and in turn, body movement. For the Japanese national team, those drills form part of their daily training and they are well educated on the topic. Endo Hiroko mentioned that rhythm moves from the lower to the upper part of the body (E. Hiroko, personal communication, November 22, 2018).

This literature review leads us to the conclusion that *randori* and *shiai* are at the top of the judo mountain and in order to scale that peak, a judo practitioner needs to undergo training in a wide range of judo-related activities connected to rhythm.

CHAPTER III: METHODS AND PROCEDURES

3.1 Research Design

This chapter analyses the methodology in the current study within a broader epistemological research and research design.

Summarising the method adopted; Six semi-structured interviews were conducted in Japanese, using a key informant sample of expert judo teachers, coded with NVivo and thematically analysed using Interpretive Phenomenological Analysis. This study was approved by the Health Science Engineering & Technology Ethics Committee with Delegated Authority (ECDA) – University of Hertfordshire, Protocol number: LMS/PGR/UH/03713.

3.1.1 Qualitative research

This study was designed to enhance the understanding of the training processes regarding the improvement of the application of rhythm by athletes from the expressed perspective of experienced high-level teachers of judo. More significantly, the research looks in detail at the role of rhythm in movement during *kata*, *randori* and *shiai*.

Qualitative research remains consistently based in the realm of expression and language and aims to describe or explain facts and not to predict them (Willig, 2013). Therefore, this research adopts a qualitative approach moving from specific observations to broader theories, rather than testing pre-existing hypotheses, and this makes qualitative research particularly suitable for exploring phenomenon such as rhythm in this particular context (Smith, 2004). Qualitative research seeks to clarify attitudes, perceptions and experiences through text analysis (Geertz, 1973) with emphasis on language and thought processes, in this case reflections by high-level Japanese judo teachers, making qualitative research an appropriate psychological approach to address the research questions posed herein (Eatough & Smith, 2008).

Theoreticians Columbus and Rice (1991) questioned the extent to which positivist research using quantitative methods can "capture the complexity" (Columbus & Rice, 1991). They also suggested that efforts to use definitions that

reflect the perspectives of third-party researchers may not necessarily be appropriate in martial arts, so to address this, the research draws on the reflections of high-level Japanese judo teachers who use their own definitions of rhythm in judo.

One characteristic of qualitative research is that the data collection is based on a verbal form rather than a numerical form. The main reason for this is that the essence of qualitative analysis is the search for codes in the analysis materials (Bryman, 2004) such as the interview transcripts. Qualitative research is also useful for exploring rich and contextual phenomena, often with an emphasis on personal experience. This fact alone makes it suitable for describing the phenomenon of rhythm.

In qualitative research, the researcher is directly involved with examining the research phenomenon in the environment, (Devetak et al., 2010). Qualitative researchers identify themselves as a link to the phenomenon being investigated and therefore affect the analytical process (Finlay & Ballinger, 2006). They question claims to impartiality and objectivity that define positivist inquiry and reject the conception of the researcher as outside observer or bystander. In this study, the researcher's years of experience in judo means that they are able to identify as the link between the phenomenon of rhythm under investigation and the analytical process of understanding and interpreting the data as expressed by the participants.

3.1.2 Epistemological perspectives

In order to evaluate a qualitative study, we first need to identify its epistemological position. Qualitative researchers can invoke different epistemological views on what constitutes knowledge and how it can be created, generally supporting the idea that research is influenced by phenomena, the interpretations of participants and researchers (Willig, 2013).

Qualitative research includes a variety of views and methodological approaches that correspond with epistemological perspectives (Finlay & Ballinger, 2006). Attempts to categorise epistemologies must be kept flexible, as distinctions are often fluid and difficult to map due to the variety both within and across approaches.

However, Madill and Shirley (2000) provide a useful categorisation of qualitative methods along a continuum of epistemologies, case study designs, and the realist version of grounded theory (Glaser, 1992) relates with this perspective. Drawing on these perspectives, a constructivist epistemology has been adopted.

Interpretative phenomenological analysis (Smith, 1996) and the constructivist version of grounded theory (Strauss & Corbin, 1990; Strauss, 1987) are realistic qualitative methods for consideration in this study, as the study seeks to explore the constructions of reality as described by the high-level teachers.

For this study the researcher brings 45 years' experience of judo to the research. This experience inevitably influenced his view on what constitutes knowledge within judo and how to create that knowledge.

How to improve the athletes' technical development is an element that led the researcher to bring knowledge to the research, rhythm and softness are elements that increase the quality of training. In the same way, the thought of improving the athlete's rhythm will bring another positive element to the athlete's performance.

The concept of what we do with rhythm or why we need rhythm in training, competition or even more generally in everyday life is something that was answered in this study by the interviewees. The development of the research questions and the method, however, were the knowledge that the researcher brought to this research which built upon a background as a dance teacher and an understanding of rhythm from a dance perspective.

From a constructivist perspective, the researcher has constructed his understanding of rhythm in judo over 45 years of experience. It is from this lens that the researcher has been able to interpret the data and make sense of the responses of the participants.

3.1.3 Qualitative approach for investigating lived experience in judo

This section will provide an explanation of why and how the qualitative approach of interpretative phenomenological analysis (IPA) was used for this study.

Qualitative methods have been deemed particularly appropriate for the exploration of complex phenomena, or those that are difficult to explore using quantitative methods (Burman et al., 1994). The aim of qualitative research is an understanding of people's experience, as the research usually involves the study of people in their natural environment (Willig, 2013). The above features are in line with the goal of this study, which seeks to explore the complex phenomena of rhythm through the experiences of experienced teachers reflecting on their natural environment. Phenomenology is a form of qualitative research that seems particularly appropriate for this purpose.

3.1.4 Phenomenology

Phenomenology is the study of structures of consciousness as experienced from the first-person point of view (Shear & Varela, 1999; Thomasson, 2005; Thompson & Zahavi, 2007). The discipline of phenomenology can initially be defined as the study of structures of experience. Literally, phenomenology is the study of "phenomena", or things as they appear in our experience (Gallagher, 2012). Phenomenology as a discipline differs but it is related to other basic disciplines such as epistemology, and logic (Smith, 2006). Phenomenology has been utilised in research in various forms for centuries but came into its own in the early 20th century in the works of Husserl, Heidegger, Sartre, Merleau-Ponty and others (Moran, 2000).

In the recent thinking, the term "phenomenology" is often limited to the properties of sense, such as seeing or hearing (Nes, 2012). However, experience is usually much richer in content than simply a sensation. Basically, phenomenology studies the structure of various types of experience, such as perception, memory, emotion, social and linguistic activity.

Phenomenology is concerned with "the way things appear to us in experience" in contrast to the production of statements or facts (Smith et al., 2006). Therefore, it is particularly suitable for the research of personal experience (Langdridge, 2007). Other researchers have supported the use of phenomenological methods to investigate martial arts (Columbus & Rice, 1998). Columbus & Rice (1998) emphasised that, in addition to their field of exploration of living experience, phenomenology also

showed significant points of convergence with Eastern philosophy within a framework that had significantly influenced Eastern martial arts. These assessments show phenomenology to be a appropriate framework for this research.

3.1.5 Interpretative phenomenological analysis (IPA)

Interpretive phenomenological analysis (IPA) is an approach to psychological qualitative research that aims to provide information on how a person, in any given context, understands a phenomenon. IPA suggests the notion of individuals as 'self-interpreting beings' (Taylor & Charles, 1985), which means that individuals are actively involved in events, and with the people in their lives (Smith et al., 2006). Consequently, IPA agrees with a critical realistic perspective, which assumes that statements from interview respondents have internal significance and are "part of their ongoing self-story and represent a fragment of their psychological world" (Smith, 1995).

However, whilst IPA endeavours to understand an experience from the point of view of the participant through an interview, at times, it can take a more distanced stance and critically examine more opaque aspects of the participant's speech. As Smith (2004) explained, IPA is an idiographic method that is concerned with the meaning-making process of individuals at case study level. Participants are experts of their experience, and by implication, of the topic under investigation (Osborn & Smith, 2008). Participant exploration is usually facilitated through interviews, diaries or electronic communications, such as email, Skype or interaction in a chat room (Tindall, 2009). In this case interviews were chosen as the method to explore the participants perspective.

3.1.6 Using IPA for this study

IPA was the most suitable methodology for this study for several reasons. Firstly, because IPA was considered to most closely reflect the author's realist epistemological view. The idiographic framework, particularly with IPA, was

regarded as a useful framework in which the current topic could meaningfully be explored. According to Smith, the use of IPA is especially suitable where the subject under investigation is novel or under-researched (Smith, 2004).

Secondly, this current research focuses on a relatively unexplored side of judo. In contrast to IPA, descriptive phenomenology and grounded theory (GT) have a limited idiographic scope (Langdridge, 2007; Tindall, 2009). Tindall, (2009) states, GT and descriptive phenomenology focus more on conceptual, theoretical macro-level accounts, whereas IPA focuses on micro-level exploration.

Finally, as the current study is the first to explore this new thematic area, IPA was considered better able to address the goal of providing a micro-level detailed account of the experience of the expert. For this study, semi-structured interviews were used as a data source. This is the most conventional form of data collection in IPA and most closely reflects the researcher-participant relationship (Tindall, 2009). Semi-structured interviews provide considerable flexibility by allowing the researcher to be guided by the phenomena interesting to the participant (Smith, 1995).

3.2 Sample Selection Process

This section will describe the rationale for the sample selection process. To remain consistent with the qualitative research approach, the sampling method helped engage participants who could provide the "most" and the "best" information to achieve the aim of this study (Holt et al., 2018).

3.2.1 Participant sample size

In some cases, IPA studies include examining the experiences and activities of only one participant. Most of the time, however, a small number of individuals, such as six, has been suggested as an appropriate number for PhD studies (Reid et al., 2005). IPA samples tend to be small to allow idiographic data analysis Smith (2004) and Smith et al (2009), recommended between four and ten interviews as appropriate

for professional doctorates. Consequently, a sample of six was deemed suitable to enable high quality analysis for this doctoral research project.

Sample similarity demands that all participants share certain characteristics, such as those pertaining to demographic factors or membership of a particular population group. Homogeneity enhances a study's generalisability. The concept of generalisability in qualitative research is different from the statistical generalisability used in quantitative studies, which is involved with rendering findings statistically representative of a wider population (Yardley, 2008).

As qualitative studies typically investigate smaller samples and are interested in individual differences, in IPA, homogeneity is achieved through the process of purposive sample selection: participants are selected because they have a particular profile that relates to the phenomenon under investigation, rather than through probabilistic methods as is methodologically sound for quantitative studies.

Typically, the process of sample selection will be defined by the research question, based on participants sharing a common experience. In this study, purposive sampling was achieved using inclusion criteria pertaining to the research question. The homogeneity of the participants was built by using criteria according to the International Judo Federation and the Kodokan Judo Institute.

3.2.2 Selection criteria

Using a key informant as an expert source of data is a research method originally used in anthropology. Because of their personal experience, key informants are able to provide more information and give a deeper insight into what is happening around them (Marshall, 1996). The key informant technique is a qualitative research method that has been effectively and extensively used in several areas of social science research. One of the benefits of the key informant technique is the quality of data that can be gathered in a short period of time Marshall, (1996).

In judo, the International Judo Federation (IJF, 2018), and Kodokan Judo Institute (Kodokan, 2020), have a ranking system criteria, (such as the belt in combination with age), which leaves no room for misunderstanding about who is an

expert and who is not. In this study, the sample selection criteria are in line with the research question and in accordance with the standards of the IJF (see Figure 3).

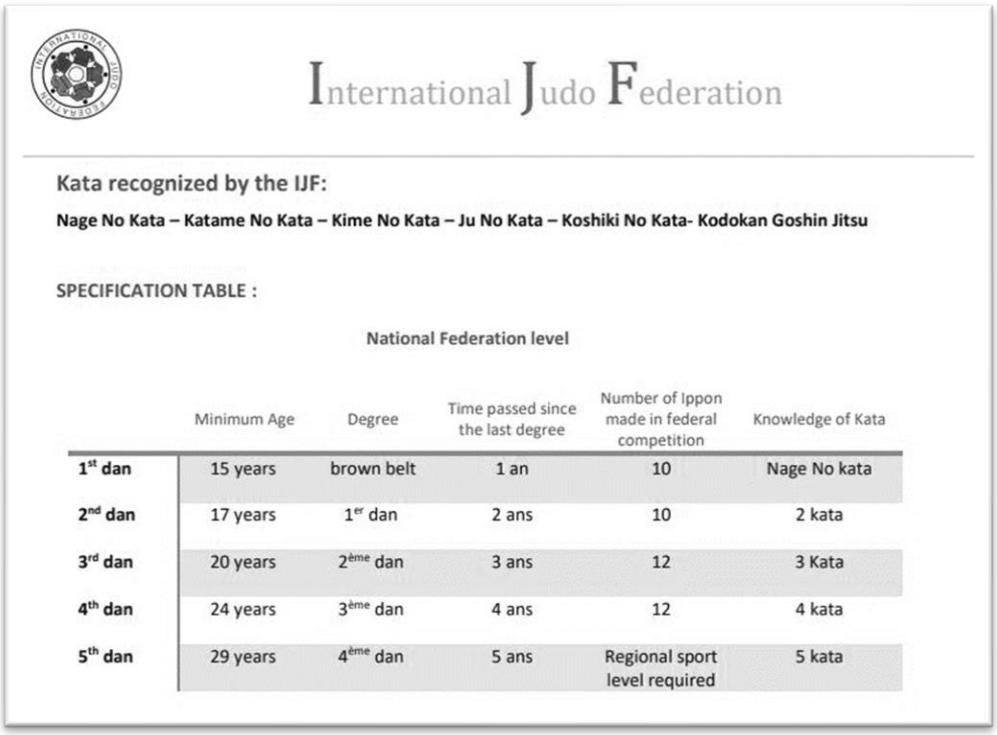
Sample size is the main consideration of whether the sample will allow the researcher "to do justice to each participant's account" (Smith & Eatough, 2006). Smith and colleagues (2009) mentioned that for professional doctorates, it is normal and appropriate to conduct between four to ten interviews.

To understand the phenomenon from the perspective of the sample group, the homogeneity of the sample is important. Homogeneity requires that all participants in a sample share certain characteristics, for example related to demographic factors or membership in a particular population group. In this study, the homogeneity of the sample is strengthened by the participation of interviewees from a single country, with the same culture and a similar level of knowledge.

Purposive sampling is normally used in IPA to select participants, rather than using probabilistic approaches, in order to ensure homogeneity, in this study Key Informant sampling was applied, a variant of purposive sampling. Participants were chosen with relevance to the phenomenon being studied, their understanding of rhythm in judo. Smith & Osborn, (2004) suggest that the method of choosing a sample is typically "naturally defined" by the research question, for example, based on the participants' shared experiences or social group membership.

Figure 3

IJF Low Grades



International Judo Federation

Kata recognized by the IJF:

Nage No Kata – Katame No Kata – Kime No Kata – Ju No Kata – Koshiki No Kata- Kodokan Goshin Jitsu

SPECIFICATION TABLE :

National Federation level

	Minimum Age	Degree	Time passed since the last degree	Number of Ippon made in federal competition	Knowledge of Kata
1st dan	15 years	brown belt	1 an	10	Nage No kata
2nd dan	17 years	1er dan	2 ans	10	2 kata
3rd dan	20 years	2ème dan	3 ans	12	3 Kata
4th dan	24 years	3ème dan	4 ans	12	4 kata
5th dan	29 years	4ème dan	5 ans	Regional sport level required	5 kata

Note. Adapted from International Judo Federation web page. Dan Ranks and Grades, 2018. p4.

https://78884ca60822a34fb0e6082b8fd5551e97bc65e327988b444396.ssl.cf3.rackcdn.com/up/2018/12/Grades_IJF_12_2018_GB-15453214-1545321438.pdf

As seen in Figure 3, the 1st to the 5th dan (degrees) are shown as low grades. Even the age for the 5th dan (minimum 29 years) is not considered sufficient experience to characterise someone as high grade. Additionally, the minimum length of time a practitioner needs to be involved with judo in order to gain the 5th dan is fifteen years.

In her research, Lutz (2013) sampled eight male participants aged 27 to 53 years, six of whom had attained a black belt (*dan*), while the remaining two had

attained a *kyu* level (coloured belt). The choice of participants was based on whether they had the necessary length of time in practice, experience or age in relation to their *dan* grade; (53 years old – 1st *dan*) however, the sample used by Lutz did not offer the same level of experience as the high-level teachers sampled in this study.

In the current doctoral study, two of the eight criteria, (age and belt degree), are based on the international standards detailed by the IJF, (see Figure 4).

Figure 4

IJF High Grades

International Judo Federation

HIGHT GRADES

National Federation level :

	Categories	Minimum Age	Time passed since the last validation	Knowledge of Kata
6th dan	A	30 years	6 years	Koshiki no kata
	B	35 years	8 years	Koshiki no kata
	C	40 years	10 years	Koshiki no kata
	D	50 years	12 years & 25 years of 1st dan	Koshiki no kata

Continental Union level:

	Categories	Minimum Age	Time passed since last the validation	Knowledge of Kata
7th dan	A	38 years	8 years	All kata
	B	45 years	10 years	All kata
	C	50 years	10 years & 25 years of 1st dan	All kata
	D	62 years	12 years & 30 years of 1st dan	All kata

Note. Adapted from International Judo Federation web page. Dan Ranks and Grades, 2018. P5,

https://78884ca60822a34fb0e6082b8fd5551e97bc65e327988b444396.ssl.cf3.rackcdn.com/up/2018/12/Grades_IJF_12_2018_GB-15453214-1545321438.pdf

A sample from a selected base of minimum 40 years old (category c) and 6th dan, gives an average experience of involvement with judo of 25 years from 1st dan (black belt) to 6th dan (red and white).

According to the Kodokan Judo Institute Yearbook (1882-2020) only fifteen people have ever reached the 10th degree (10th *dan*) and, of those fifteen, only one is alive at the time of writing, (see Table 3).

Table 3

Japanese Terminology used to Describe Rank or Dan Grade

English	Japanese
1st degree	*shodan*
2nd degree	*nidan*
3rd degree	*sandan*
4th degree	*yodan*
5th degree	*godan*
6th degree	*rokudan*
7th degree	*shichidan*
8th degree	*hachidan*
9th degree	*kudan*
10th degree	*judan*

Collins (2009) argues that, traditionally, coaches placed an emphasis on teaching Japanese terminology and demonstrating techniques. Collins stated that, "although demonstrating techniques from the belt system is necessary for students to progress through the belt syllabus, this appears to be a seemingly outdated approach for modern day competitive judo coaching as it is not preparing judo practitioners effectively for high-level judo competition" (Collins, 2009). However, over the years, the traditional Japanese teaching system placed an emphasis on fundamentals and has been successful in high-level judo competitions such as Olympic games and world championship.

The two other criteria pertaining to the participants in this study were gender and nationality.

Gender: According to Lutz (2013), martial arts remain a mostly male-orientated activity. A recent UK-based survey with practitioners of various martial arts found that over three quarters of respondents described themselves as male (Jones et al., 2006). An earlier survey on sport in England also reported more people identifying as male participants in martial arts (*Young people and sport-National survey*, 2002).

Based on International Judo Federation Gender Equity Commission, the gender statistics retrieved from IJF Judobase, 2022 showed that the active coaches in 2022 were 2,175 (86.28%) male and 346 (13.72%) female (IJF, 2022).

Japan ranks 116th on the Global Gender Gap Index 2022 rankings, 121st by Economic Participation and Opportunity and 139th by Political Empowerment (WEF, 2022). Political Empowerment is a measure of the leadership within the country, the ratio of female leaders in Japan is calculated as 0.061. This mean that for every 100 leaders, 94 would be male and 6 female. Based on these analyses the decision was taken to include only male participants in this study.

Nationality: Based on a review of literature, except for references in books by Japanese judo experts, there is no research on rhythm in judo, which makes the current study pioneering. Japanese experts explain the importance of rhythm in judo in various ways and also provide a definition of rhythm in judo. This makes Japanese experts more suitable for this research.

Japanese experts are not only perfectly suited to this study because judo is part of their culture, they were also selected because of their involvement with so many high-scoring athletes in both international competition and, the most important competition in judo, the Olympic Games, (Daniel & Daniel, 2013; Ferreira Julio et al., 2013; Franchini & Julio, 2015; Franchini & Takito, 2014; Guilheiro & Franchini, 2017; Niehaus, 2006; Sato, 2013; Villamón et al., 2004), (see Table 4).

Table 4

Top 10 Countries

GOLD MEDALS	1956-2004
Japan	120
France	39
Korea	28
Great Britain	17
Cuba	16
Former Soviet Union	16
China	16
Germany	15
Netherlands	14
Belgium	11

Note. Adapted from judoinfo web page. The top gold medal producing countries in either the Olympics or World Championships since 1956.

https://judoinfo.com/champs2/

For this study, three top university teachers and three high-performance coaches were selected, all of whom have won Olympic medals.

Teaching experience and current role (national coach or associate professor) were two more criteria taken into account for selection (see Table 5).

Table 5

Minimum Sample Selection Criteria

Age	Gender	Nationality	Rank	Graduate	Training duration	Teaching experience	Current role
40	M	JPN	6th *dan*	University	25 years	10 years	NC/AP*

Note. *National Coach / Associate Professor

3.2.3 Participant profiles

Table 6 provides an overview of individual participant profiles, outlining demographic characteristics, experience in judo and current role. Pseudonyms have been used to ensure anonymity. Table 6 and 8 provides an overview of participants' years of teaching and training experience.

Table 6

Participant Profiles

Participant	**Age**	**Nationality**	**Belt rank**	**Graduate**	**Training duration**	**Teaching experience**	**Current role**
Kom	68	JPN	8th Cat, A	Tokyo university	56 years	46 years	JUA – kata commissioner
Mit	69	JPN	8th Cat, A	Tokai university	59 years	47 years	a. Shihan b. P.T.L.
Yam	50	JPN	7th Cat, C	Tokai university	46 years	27 years	a. U.H.C. b. V.C. c. S.M.
Mas	49	JPN	7th Cat, B	Tsukuba university	39 years	19 years	a. A.P. b. N.H.C.
Ino	41	JPN	7th Cat, A	Tokai university	36 years	12 years	a. O.T.C. b. U.H.C. c. P. d. O.C.M.
Kan	40	JPN	6th Cat, C	Tsukuba university	35 years	11 years	a. A.P. b. N.C.

Note. Explanation of Symbols Used (see Table 7).

Table 7

Explanation Symbols

P.	Professor
A.P.	Associate Professor
P.T.L.	Part time lecturer at university
O.T.C.	Olympic Team Coach
N.H.C.	National Head Coach
N.C.	National Coach
U.H.C.	University Head Coach
V.C.	Vice Chairman of National team committee of all Japan Judo Federation
O.C.M.	Olympic Committee Member
S.M.	Sport Manager of Olympic Games Organisation Committee
J.U.A.	Judo Union of Asia Commissioner
Shihan	Honorific title for expert or senior instructors

Table 8

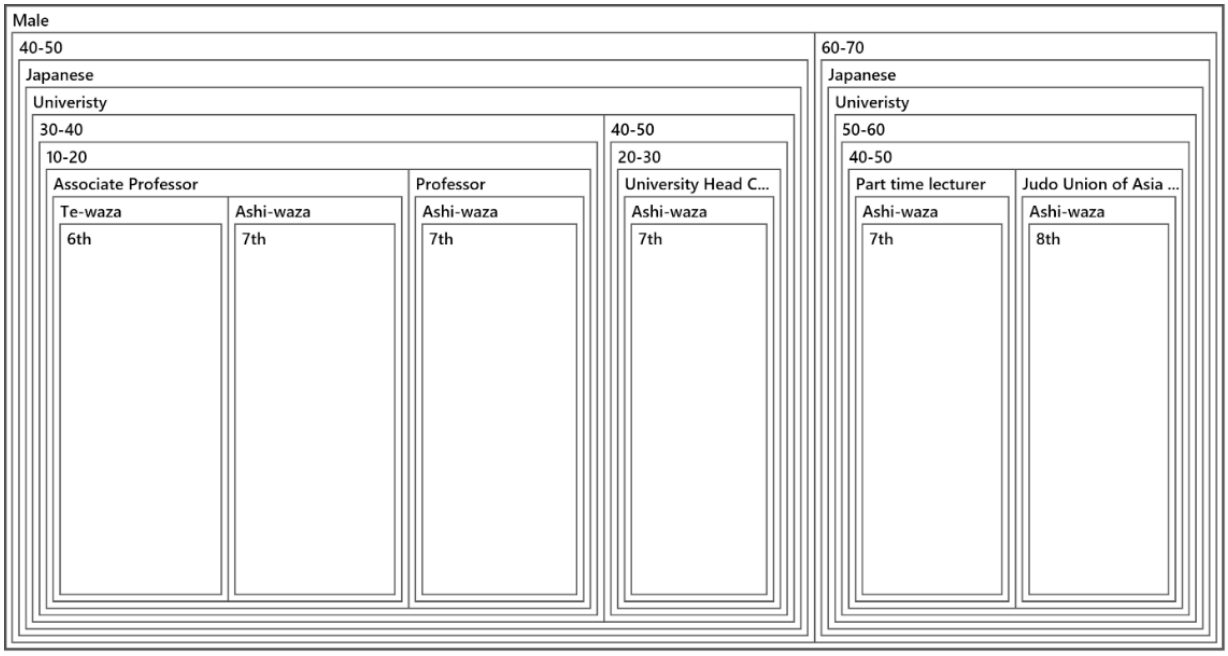
Participants' Experience - Mean and Standard Deviation

Mean age = 52.83	Mean training dur. = 45.16	Mean teaching exp. = 27
SD = 11.68	SD = 9.44	SD = 14.75

3.2.4 Participants demographic data

Figure 5

Demographic Data



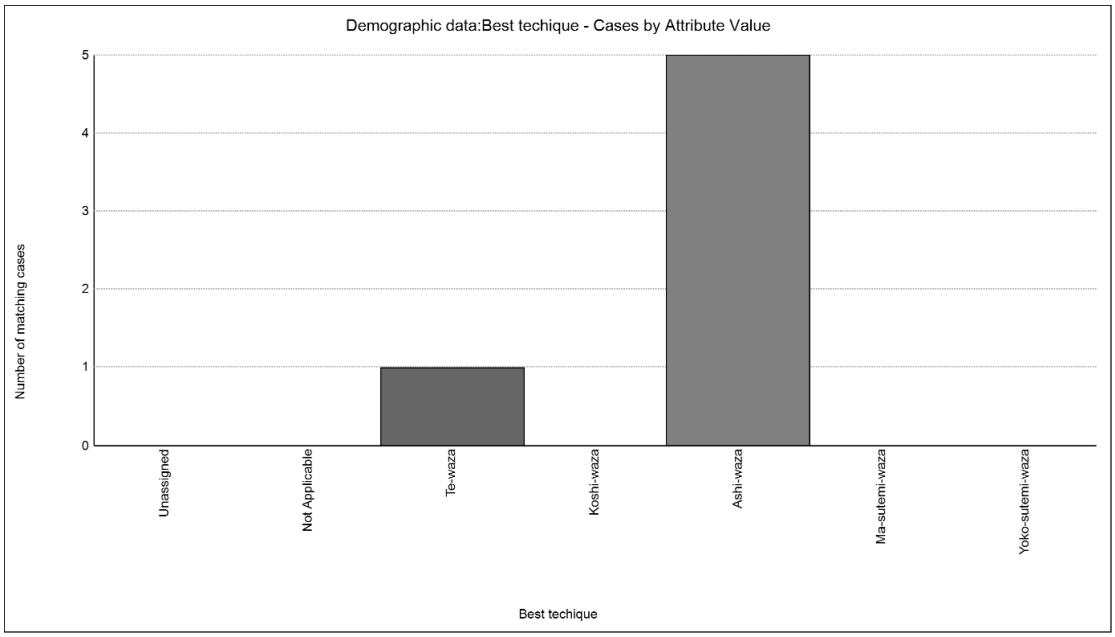
As seen in Figure 5, five to six of the participants have a preference for leg techniques (Appendix O) which belong to the group called '*ashi-waza'* (Kodokan, 2021). An athlete's best technique is called *tokui-waza* (*Japanese Judo Terms*, 2020), and something which is defined as "a judo practitioner's favourite match-winning throw or preferred technique". Desormeaux (2012) mentioned, *tori* should be able to entice *uke* to open their moves with the rhythm imposed by *tori* for the effective use of their *tokui-waza*. However, Alfredo Vismara, 8th dan, argues that instead of mastering a technique, athletes might learn techniques suited to the situations they face in the game (Vismara, 2016).

The Japanese judo education system encourages athletes to study all techniques in order to understand which technique is needed when and in which

situation. Through this process the body, in collaboration with mind, learns to automatically react appropriately and at the right time. This results in the use of the most appropriate technique for the *judoka*. Some teachers teach based on the body type of the athlete. In this study, the participants had a common understanding (see Figure 6) of the leg technique group, which is common in Japan considering how many times teachers mentioned the importance of leg techniques in unbalancing the opponent.

Figure 6

Participants' Tokui-waza (Best Technique)



3.3 Interview Plan

This study followed procedures by Smith and colleagues (2009) who suggested using an interview plan for semi-structured interviews to enable reflections on the expected remit of the topic area and possible problems during the interview. The choice and order of interview questions followed a process of 'funnelling' (Osborn & Smith, 2008), with questions moving from the general to the particular and

specific. This process eases interviewees into talking about the topic area and facilitates a deeper understanding of the subject matter over the course of the interview (Tindall, 2009).

3.3.1 Designing research questions

Kano, (1932) stated, training in judo is based on three basic methods, *kata* (formal exercises), *randori* (freestyle fighting), and *shiai* (contest). According to Kudo, (1967) the participants must have an in-depth experience in each of those three elements.

Research is more than simply searching for facts, it is a methodical analysis for answering a research question (Gratton & Jones, 2014). For the purposes of this study, five general stages were proposed. They were a) creating the research question, b) planning data collection methods for the responses to the question, c) data collection, d) analysis of the data e) results.

In any field of study, there must be structure so that the contents of that area of study can be understood logically. This structure must have a firm theoretical and philosophical foundation based on practical application. Judo has such a structure and is comprised of three fundamental aspects that have not changed since they were conceived by Jigoro Kano. These three elements are, *kata*, *randori*, and *shiai*, and are "building blocks that are interdependent on each other and build on each other to form a solid foundation of learning" (Scott, 2019).

Therefore, both judo structure and the fact that those three basic training methods have not changed, led to the formulation of three research questions related to this study:

Research question 1) *kata* stage (fundamentals), How do high-level teachers perceive the contribution of rhythm to the first steps of the practitioners?

Research question 2) *randori* stage (free training), How do high-level teachers evaluate the importance of rhythm in randori and its relationship in daily training?

Research question 3) *shiai* stage (contest), How do top-level players use rhythm for offence/defence?

3.3.2 Relating interview questions to the research questions

This section explains the relationship between the research and the interview questions. The final interview schedule (Appendix E) contained nine questions designed to address the research questions. (Table 8) shows how the interview questions relate to the research questions.

At the fundamental stage there are three concepts that need to be explored:

a1. *Ukemi* (breakfalls) is fundamentally the first thing practitioners learn in judo. Does ukemi relate to rhythm? If so, how does it relate?

a2. Teachers mentioned *tai-sabaki* (body movement) as a tool for athletes to use their body rhythmically, please can you explain more? How can *tai-sabaki* can teach the athlete to use his body rhythmically?

a3. *Kuzushi* (breaking balance), *tsukuri* (set-up to execute technique), *kake* (throwing), is the three phases of throwing, based on your experience how is rhythm connected to this?

The following questions were formulated to investigate this phenomenon:

b1. What aspects of training have been an important part in rhythm development?

b2. In what ways, can you help your students to develop rhythm in *randori*?

b3. Please can you describe to me what is rhythm in judo for you?

After the London 2012 Olympics, the Japanese Olympic bronze medalist Nishiyama Shoji -90kg said “the reason for my defeat was that the opponent dragged me to his rhythm. I was confident about what I had done so far, and I was able to create my own rhythm in practice and be able to transfer to the competition” (*Masashi Nishiyama*, 2021).

The question for many teachers is, how to break the opponent's rhythm? The third research question can be answered with the responses to the following three interview questions:

c1. Teachers mentioned the important of rhythm in *randori* (free training) in order for players to transfer rhythm into *shiai* too, please explain more, why this is important?

c2. Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?

c3. Please can you explain more about why it is important to break the opponent's rhythm? (see Table 9).

Table 9

Interview Questions in Relation to Research Questions

	Research Question	**Interview Questions**
Question 1	*Kata stage,* How high-level teachers perceive the contribution of rhythm in the first steps of the practitioners?	1.1 *Ukemi* is fundamentally the first thing practitioners learn in judo, how *ukemi* relate to rhythm? 1.2 Teachers mentioned *tai-sabaki* as a toll for athlete to use body rhythmically, please can you explain more? How *tai-sabaki* can teach the athlete to use his body rhythmically? 1.3 *Kuzushi, tsukuri, kake*, is the three faces of throwing, based on your experience how rhythm connect?
Question 2	*Randori* stage, How do high-level teachers evaluate the importance of rhythm in *randori* and its relationship in daily training?	2.1 What aspects of training have been an important part in rhythm development? 2.2 In what ways, can you help your students to develop rhythm in *randori*? 2.3 Please can you describe to me what is rhythm in judo for you?
Question 3	*Shiai* stage, How top-level players can use rhythm for offence/defence?	3.1 Teachers mentioned the important of rhythm in *randori* in order players transfer rhythm in to *shiai* too, please explain more, why this is important? 3.2 Rhythm can be a tool during the training, but during the fight how to break the opponent's rhythm? 3.3 Please can you explain more, why it's important to break opponent rhythm?

3.3.3 Developing the questions

A pilot interview plan was developed in line with Smith and colleagues (2009) who suggest researchers review their interview schedule following the initial interviews. However, for the purposes of this study the method was used for testing the questions was done during the preparatory interviews in three stages.

Stage one involved interviewing two Greek coaches (in the researcher's native language) to investigate whether the questions were understandable. The preparatory interview stage participants were four head coaches at judo clubs with a good understanding of judo. The questions used were a preliminary draft of the final interview questions. A review of transcripts from the first two interviews showed that the questions were understandable, though there was a small difficulty in relation to Question 4 "Define rhythm in judo", and Question 5, "From one to ten, how would you classify the ten stages of rhythm".

Stage two (Appendix C) involved interviewing two Japanese coaches, to investigate how well the questions were understood when asked in English. The participants were 4th *dan* national team head coaches based in European countries, and with an excellent understanding of judo. A review of transcripts revealed different issues with the questions than in the preparatory interviews. Both question 4, "Define rhythm in judo", and question 5, "From one to ten, how would you classify the ten stages of rhythm", were answered with relative ease most likely due to their level of knowledge. However, it was observed that as native Japanese speakers who spoke English as a second language the participants did not have a clear understanding of the meaning of the questions in English and tried to translate the questions back into Japanese during the interview often giving answers such as 'yes', 'no', 'ok', or 'maybe'. As a result, no useful data was received. The identification of these difficulties resulted in two major changes: a change to more open, unstructured questions and the addition of an English - Japanese interpreter during the following interviews.

For stage three (Appendix D), it was considered that a further interview was necessary as a final test. The participant was a different Japanese 4th *dan* national team head coach who was based in a European country and who had an excellent understanding of judo. The interpreter was Japanese with a very good level of English. A review of the interview transcript shows that everything went smoothly, both in terms of understanding the questions and in terms of the answers. For the above reasons, the hiring of a professional interpreter was considered appropriate for the collection of quality data.

3.3.4 Reflection on the pilot prosses

The preparatory interview stage participants were four head coaches (in the researcher's native language) at judo clubs with a good understanding of judo, all of them Greek champions in the past and national team members. During an open conversation about the project, they realised the gap in the existing knowledge in the field of rhythm in judo. A general conversation naturally emerged on how rhythm can be used in training and transferred into shiai. Another point mentioned was that Greek coaches often encourage players to have rhythm in training, for example, to perform uchikomi better, but during the randori, no one uses this topic during their advice. One of the coaches openly asked the others; "mastering a technique is one thing but to perform it at the competitions successfully is another thing".

Stage one involved interviewing two Greek coaches to investigate whether the questions were understandable. A review of transcripts from the first two interviews showed that the questions were understandable, though there was a small difficulty in relation to Question 4 "Define rhythm in judo", and Question 5, "From one to ten, how would you classify the ten stages of rhythm". Question 4 elicited more questions than answers from respondents and comments such as "good question, I didn't think about it before" or "I believe that the correct answer to this question must be found at the stage of fundamental judo". Question 5 was also a topic that made respondents ask themselves which of these steps they followed in their own teaching methodology. These preparatory and pilot interviews gave a clear message from the beginning that beyond the question titles the interviews should be open to experience, thoughts and emotions to obtain as much data as possible.

Keeping all those points in mind the researcher started thinking about the option of interviewing Japanese young coaches based in Europe as a second pilot stage. Stage two involved interviewing two Japanese coaches, to investigate how well the questions were understood when asked in English. The participants were 4th dan head coaches for national teams who were headquartered in Europe and had a thorough knowledge of judo. A review of transcripts revealed different issues with the questions than in the preparatory interviews. Due to their level of understanding, they were able to answer questions 4 and 5 rather quickly and accurately. Question 4

asked, "Define rhythm in judo," and question 5, "From one to ten, how would you define the ten stages of rhythm?" However, it was noted that because the participants were native Japanese speakers who also spoke English as a second language, they struggled to understand the questions' intended meanings and attempted to translate them back into Japanese throughout the interview. This took a lot longer and its weak points were firstly the flow of thoughts stopped resulting in lost answers and secondly, the translation often didn't make the right sense, often leading to answers such as ‘yes’ or ‘maybe’. As a result, the researcher thought that the questions should be clear in meaning in order to interview an expert teacher. Two significant improvements were made as a result of the identification of these issues: the use of more open-ended, unstructured questions and the use of an English-Japanese interpreter for the subsequent pilot interview.

For stage three, it was considered that a further interview was necessary as a final test. The participant was a different Japanese 4th dan coaching national squad who was living in Europe and had a thorough knowledge of judo. The interpreter was also Japanese with a very good level of English. The interview went without a hitch, according to the transcript, both in terms of understanding the questions and providing accurate responses. After the end of the interview, the researcher asked the respondent if he found the questions easy or difficult and understandable or not, more specifically the questions were easy, and he understood them completely. For the above reasons, hiring a professional interpreter was considered appropriate for collecting quality data.

3.3.4.1 Reflection of previous presentations

The learnings from the pilot studies and previous presentations helped the researcher to formulate the questions, during the 5th European Science of Judo Research Symposium & 4th Scientific and Professional Conference on Judo, the researcher delivered a practical presentation on the mat entitled, “Judo and rhythm; the important stage of the athlete’s” development”. After the end of the presentation, the researcher received questions such as; “how do we know what is important and what is not?”. This made him reconsider the topic that was later rejected; “Judo and

rhythm; the important stage of the athlete's development". The reason was instead to explore the important stages of rhythm in athlete development it should be researched how the experts see the application of rhythm in the three stages as Kano Jigoro mentioned "kata, randori, shiai". Based on this the researcher started to develop the research questions and interview questions.

3.3.5 Language interpreting

For this study, the employment of an interpreter was considered as appropriate action to secure the data quality during the interview process. For this reason, a professional interpreter was hired to join the online all six interview meetings. It was advantageous in this study to utilise the same interpreter for all of the interviews (Kapborg & Berterö, 2002).

The interpreter is a native English speaker who has an MA degree in Interpreting and Translation (Japanese - English) and has worked professionally in Japan as a television producer for many years. Further details on the interpreter's background can be found in Appendix K.

The same procedure was followed for all six interviews, during which the researcher asked the questions in English, and the interpreter translated them into Japanese (see Table 10). The interviewee answered in Japanese and then interpreter translated back into English (Appendix L). All interviews were held online, five meetings were via the Zoom application and one was via the Facetime application. A voice recorder was used to record the interviews.

Table 10

Example of the First Group of Questions Used

Question 1	*Ukem*i is fundamentally the first thing practitioners learn in judo. Does *ukemi* relate to rhythm? If so, how does it relate? 柔道家が初めて柔道を勉強する時、受身を勉強します。受身はリズムと関係があり ますか。もしそうであれば、どういう関係ですか。
Question 2	Teachers mentioned *tai-sabaki* as a tool for athletes to use their body rhythmically, please can you explain more? How can *tai-sabaki* can teach the athlete to use his body rhythmically? 柔道の先生方により、柔道選手が体をリズミカルに動かすため、 体さばきを使うの が普通です。この考えについて、もう少し説明していただけますか。 というのは、どうやって 体さばき を使って、リズミカルに体を動くようにすること ができるかということです。
Question 3	*Kuzushi, tsukuri, kake*, is the three phases of throwing, based on your experience how is rhythm connected to this? 投技は 崩し 、 作り と 掛け でできています。（名前）先生の経験から見れば、投技と リズムはどういう関係があります。

3.4 Data Collection Tools

All participants were invited by the researcher to attend interviews via e-mail (Appendix G), during a period when many countries were in compulsory lockdown due to the Covid-19 virus (April-May 2020). Throughout the recruitment process, the initiative to participate in the research belonged to participants. Correspondence was via email due to the time difference between Greece and Japan (Japan +6 hours).

Due to their background as a professional coach, the researcher had visited Japan many times and had personal contact with all six participants. Due to the Covid-related lockdown, all of the participants had a great deal of time to spare, which is something very unusual in the field of international judo. All the participants are active coaches and university teachers and usually have heavy teaching schedules. The researcher believes that the reason everyone responded with enthusiasm, was that they had more free time than usual and were also personal acquaintances of the researcher. The discussion chapter addresses any potential bias, limitations or benefits

of this researcher familiarity. For the final version of interview questions, (see Table 11).

Table 11

Final Version of Interview Questions

Final Interview Schedule
Today is… / of ……/2020
and I am going to interviewing Mr…….. together with Ms ……. the interpreter
Do I have your agreement to record your voice? Ms ……. do I have your agreement too?
As you know from the information sheet, you are free to stop interview at any stage without giving a reason.
Also, if a question makes you feel uncomfortable do not need to answer it
I would like to start by asking you about your experience in judo
1. *Ukemi* is fundamentally the first thing practitioners learn in judo. Does ukemi relate to rhythm? If so, how does it relate?
2. Teachers mentioned *tai-sabaki* as a tool for athletes to use their body rhythmically, please can you explain more? How can *tai-sabaki* can teach the athlete to use his body rhythmically?
3. *Kuzushi, tsukuri, kake,* is the three phases of throwing, based on your experience how is rhythm connected to this?
4. What aspects of training have been an important part in rhythm development?
5. In what ways, can you help your students to develop rhythm in *randori*?
6. Please can you describe to me what is rhythm in judo for you?
7. Teachers mentioned the important of rhythm in *randori* in order for players to transfer rhythm into *shiai* too, please explain more, why this is important?
8. Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?
9. Please can you explain more about why it's important to break the opponent's rhythm?
10. We are coming to the end of the interview now. Is there anything else that you would like to add?
11. What was like for you to do this interview?
12. Did you find it easy/difficult?

3.4.1 Interviews

During the Covid-19 pandemic, close contact with other people was forbidden by law in Japan, so individual interviews were arranged (Appendix F) at the participants' convenience via online applications such as Zoom and Facetime. All interviewees were online 10 minutes prior to the interviews and had an opportunity to ask questions, introduce themselves to the interpreter, or discuss any concerns about the study.

One day prior to the interview participants signed two copies of a participant consent form one of which was retained by the researcher (Appendix I), and the other which was retained by the participant (Appendix H).

The interviews lasted between 30 to 40 minutes and were recorded. After the interview, participants received a debrief sheet (Appendix J). All interviewees received a copy of their individual interview, voice recording via the WeTransfer application and the interview transcript sent via email. All participants answered the questions spontaneously and were enthusiastic about the research topic.

3.4.2 Ethics

Ethical considerations are an essential part of any research plan (Sales & Folkman, 2000; Walker, 2007). It is the responsibility of the researcher to protect and ensure the well-being of participants at all stages of the research (Barrett, 2007; Gibbs, 2007).

This study was approved by the Health Science Engineering & Technology ECDA – University of Hertfordshire. Protocol number: LMS/PGR/UH/03713 (Appendix M). The main ethical considerations addressed in this study are outlined as follows:

3.4.2.1 Information and consent

To be able to consent, participants must be completely aware of the scope and aims of the research from the outset.

Researchers have a duty to inform participants about the detail of the research and what is happening to the data and research material (Barrett, 2007; Lo Piccolo & Thomas, 2008).

In current study, the researcher sent an informative document via e-mail explaining the purpose of the study, including issues regarding confidentiality, anonymity, and consent. That the participation was voluntary was made clear by informing the participants they could leave or stop the interview at any stage without giving reasons.

3.4.2.2 Confidentiality

Ethical guidelines require that for the purpose of participant protection, research needs to protect the confidentiality of participants. The information sheet informed participants that their data would remain confidential, according to University of Hertfordshire - form EC1A: Application for Ethics Approval of a Study Involving Human Participants (Confidentiality and Consent, Question 15). The researcher kept any materials including identifying information in a locked storage cabinet.

Though good qualitative research is likely to be interesting to both participant and researcher, it can also be a positive and even therapeutic experience for participants (West, 2002). Strong emotional reactions in participants, negative or positive, is a possibility. To avoid this situation, West (2002), suggested that researchers should remain responsive to any distress the interview process might cause participants. Although the research topic was not considered particularly sensitive, and the risk of it causing distress was considered low, several actions were taken to minimise that possibility and participants were informed on the information

sheet that if a question was making them feel uncomfortable, they were not obliged to answer.

3.5 Procedures for Collecting Data

Following each interview, the audio-recorded interviews were translated into English and transcribed, for the purpose of anonymity, pseudonyms were used throughout. All interviewees received a copy of their individual interview transcripts via e-mail (Appendix N). This was given to the respondents for verification, ratification and the accuracy of the information provided, a step that is an important factor in research transparency. None of the six interviewees commented on their transcripts, nor had concerns or corrected the terminology.

The data analysis followed the standard analytic process for IPA outlined in the literature (Smith, 1995; Tindall, 2009). The six steps were used for thematic analysis: 1 familiarisation with data, 2 generate initial codes, 3 search for common themes, 4 review names of themes, 5 define consolidate final themes, 6 use themes to produce reports (Braun & Clarke, 2006).

As such, the interview recordings were reviewed by the researcher and interpreter multiple times and the transcripts were read and re-read repeatedly word for word to ensure accuracy (Fontana & Frey, 2000). Repeated reading generated preliminary themes which were coded as themes using QSR NVivo software (version 12.0 pro) for qualitative data analysis. Following this, NVivo coding was used to identify similar sub themes. This process shaped the basis for a more detailed analysis and the collapsing of developing themes. A complete list of all themes was collected, and these were grouped according to superordinate themes.

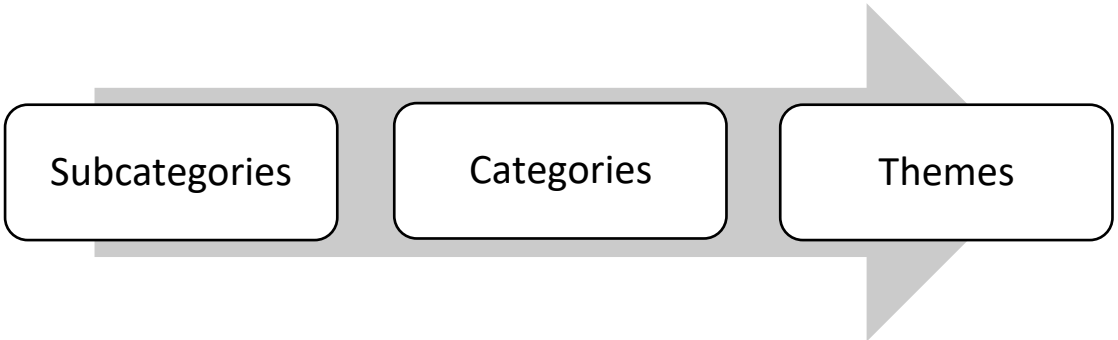
3.5.1 System analysis

To analyse qualitative data, IPA researchers are encouraged to follow the guidance set by Moustakas (1994) who developed a series of methods that phenomenological researchers were advised to use in analysing their studies. The idea was that IPA researchers would have a more cohesive analysis method that would reflect the phenomenological philosophy in their research study (Moustakas, 1994).

Creswell (2013) recommended that researchers should develop a list of significant statements as a basis to understanding the phenomenon. These statements can come from interviews and other related research sources that speak to the experience that's being studied. Creswell (2013), suggested that researchers should take into account each statement as having equal worth, and work to build a list of non-repetitive non-overlapping assertions (Creswell, 2013). After the development of these statements, researchers should take the most significant statements and then group them into larger units of information, (see Figure 7) called themes. The next stage, after grouping the text elements, is to form a large unit of information (Creswell & Poth, 2016).

Figure 7

Analysis Structure Diagram



3.5.2 First stage of data analysis

A deductive-inductive approach was used to analyse the data from the interviews. This method engaged the identification of textual elements that have common characteristics or meanings and can be grouped in categories and subcategories (Krippendorff, 2018; Li et al., 2008).

The classification can be done in three ways: closed, open, or mixed. In this study, the researcher used the open category to investigate new aspects emerging from the interviews that may have generated new concepts or theories (inductive approach), (Williams, 2007). The QSR NVivo software (version 12.0 pro) was used to analyse the data.

3.5.3 Second analytic stage

Upon conclusion of the first analytic stage, a summary of analytic insights (Appendix P) was developed and emailed to all participants. The purpose of giving participant feedback was mainly to provide participants with a chance to be actively involved in the research process as beneficiaries of generated knowledge. This was in line with the principles of research transparency and participant involvement. Secondly, it provided further opportunity to collect additional information in the form of the participants' reactions to feedback. This process is similar to IPA's importance on knowledge emerging through an iterative process (Eatough & Smith, 2008; Osborn & Smith, 2008; Smith & Shinebourne, 2012). Creswell & Clark (2011) propose the use of Krippendorff's alpha agreement measurement which is used to reduce any possible subjectivity present in qualitative research (Creswell & Clark, 2011; Creswell et al., 2011).

3.6 Participants' Feedback

At this stage, a summary of interview quotes was emailed to all participants (Appendix S). The purpose of giving participant feedback was firstly to provide participants with the opportunity to be involved in the research process at all stages, which is in line with the principles of research transparency and participant involvement and, secondly, to provide further opportunity to collect additional information in the form of participants' reactions to the feedback (see Figure 8). This process is similar with IPA's importance on knowledge emerging through an iterative process (Osborn & Smith, 2008).

Figure 8

Participant's Confirmation

3.7 Quality Assurance

3.7.1 Rigour in qualitative research

Qualitative and quantitative methodologies differ regarding to the criteria by which they assess scientific validity. The epistemological position of qualitative research suggests that objectivity and the absence of bias are not meaningful concepts (Lutz, 2013). Consequently, positivist criteria used to evaluate the scientific value of research, such as reliability and statistical generalisability, are not appropriate within a qualitative epistemology (Willig, 2013; Yardley, 2008).

Despite the broad range of criteria used for evaluating different types of qualitative research there is a consensus that research needs to be 'trustworthy' in the sense of demonstrating rigour and relevance (Finlay, 2006). Rigour is concerned with the integrity of the research process and includes various aspects of study design, procedure and analysis (Finlay, 2006).

Design-related criteria for rigour include the compatibility of the research question with the methodology adopted, and the study's theoretical and philosophical compatibility with the epistemological framework in which the methodological approach is located (Yardley, 2008). Procedural aspects of rigour relate to practical and analytic considerations like sample choice or the thorough and systematic application of the analytic procedure. In this study, the conceptual and epistemological compatibility of the research questions and objectives with IPA has been presented in some of the preceding sections.

3.7.2 Measures to ensure validity

For this, study actions were taken to ensure procedural validity following the principles outlined by Yardley's (2000) framework for evaluating validity in qualitative research. These included transparency and researcher triangulation.

Transparency is synonymous with the concepts of dependability and confirmability (Lincon & Guba, 1985). For the purposes of this study, several methods were used to protect clarity. Attention was taken to ensure that the views of the participants and the researcher were clearly distinguishable during the entire research process, a process which was described in detail (Smith, 1995). Another important element of transparency is the epistemological basis of the qualitative research. Smith, (1995) mentioned, qualitative researchers need to pay careful attention to their role in the research and clearly address their impact on the analytic process as recommended for IPA-related research.

Another suggested approach for the enhancement of validity is that of ‘researcher triangulation’ Lincoln & Guba (1985), which is an attempt to confirm the acceptability of one's findings through peer-review by colleagues. Researcher triangulation has been considered suitable for verification of complex and subtle coding, making it appropriate for an IPA study (Yardley, 2008). In this study, a colleague comfortable with doctoral-level IPA research examined the analytical process and judged the outcomes according to their applicability and consistency with the data. To allow the colleague to examine the theme generation process, they were provided with original transcripts, all related word documents created in the process of theme generation, and all versions of the theme table and model. Having examined the data they stated: "I was able to clearly see a connection between the raw data and the themes". They also commented on the model: "The model gives an interesting graphic description of participants' experiences, I can see that the model succinctly captures the range of participants". This procedure enhanced both the study's analytic process and its ethical integrity.

3.7.3 Authenticity

Following the pilot phases the intended interview questions were refined. A fellow PhD student with a high level of judo expertise, acted as a critical friend and checked that the questions made sense. The researcher gave the fellow PhD student access to the original transcripts, every associated document produced throughout the thematic development process, and every iteration of the theme table and model so that he could evaluate how themes were generated. Having examined the data, he stated: "I was able to clearly see a connection between the raw data and the themes". He also commented on the model: "The model gives an interesting graphic description of participants' experiences; I can see that the model succinctly captures the range of participants". This critical friend method improved the study's analytical method and ethical integrity.

3.8 Summary of the Methodology

IPA is concerned with the detailed examination of individual lived experience and how individuals make sense of that experience (Tindall, 2009). Although developed in the field of psychology, IPA is increasingly being used in the human, social, and health sciences (Charlick et al., 2016).

According to Smith et al., (2009) phenomenology is a philosophical approach to the study of experience. It guides researchers towards thinking about the human experience and has as its goal the exploration of a lived experience. Descriptive Phenomenology aims simply to describe a lived experience without trying to give meaning to it (Tindall, 2009).

In this study the researcher chose to request the contribution of teachers with the highest possible level. All of them are university professors, hold a top-ranking degree (6th *dan* or over), and either have experience as a national team coach, and or are international or Olympic medallists. The fact that all participants in this study have reached the highest level in their field means that the experiences shared in the interviews have been proven through their coaching practices. Based on their teaching

experience and training results, they answer interview questions with absolute certainty, explaining the way to develop players technical skills.

The interviews revealed information data that would not be heard in the *dojo* (training room) and which related not only to training and results, but also the application of the high standards of judo principles and philosophy in daily life. Semi-structured interviews were used in this study to allow for reflection on the issue area's intended remit. Questioning for research the three primary types of judo training, according to Kano (1932), are *kata*, *randori*, and *shiai*, participants have extensive familiarity with each of the three aspects. For the purposes of this study, a pilot interview plan was created to test the questions, which was done in three phases during the preparation interviews, interviewing two Greek coaches in the researcher's native language, interviewing two Japanese coaches, to investigate when asked in English, how well were the questions understood and interviewing one more Japanese coach with a very good level of judo. The interpreter for the final pilot was Japanese with excellent understanding of English. For this study, during interviews, a professional interpreter was used to secure the data quality during the interview process.

The Health Science Engineering & Technology ECDA – University of Hertfordshire authorised this project due to ethical concerns.

This study employed an interpretive phenomenological analysis technique, which allowed respondents to articulate themselves and their lived experiences in their own words, firstly, data analysis was used to analyse the data from the interviews and secondly upon the conclusion of the first analytic stage, a summary of analytic insights was developed and emailed to all participants.

CHAPTER IV: RESULTS

4.1 Results of the Coding

Across the six interviews, there were 154 comments that emerged which were coded against 55 different sub-categories (see Figure 9). These 154 comments are known as textual elements (NVivo refers to these textual elements as references). These textual elements went through three stages of elaboration and thematic analysis using IPA, firstly into the 55 sub-categories, then the sub-categories were merged into eight categories and then these combined into four themes.

The QSR NVivo software (version 12.0 Pro) was used to analyse the data and 154 textual elements (references) were grouped in to 55 subcategories.

Figure 9

Summary of Total Textual Elements by Interview

Files

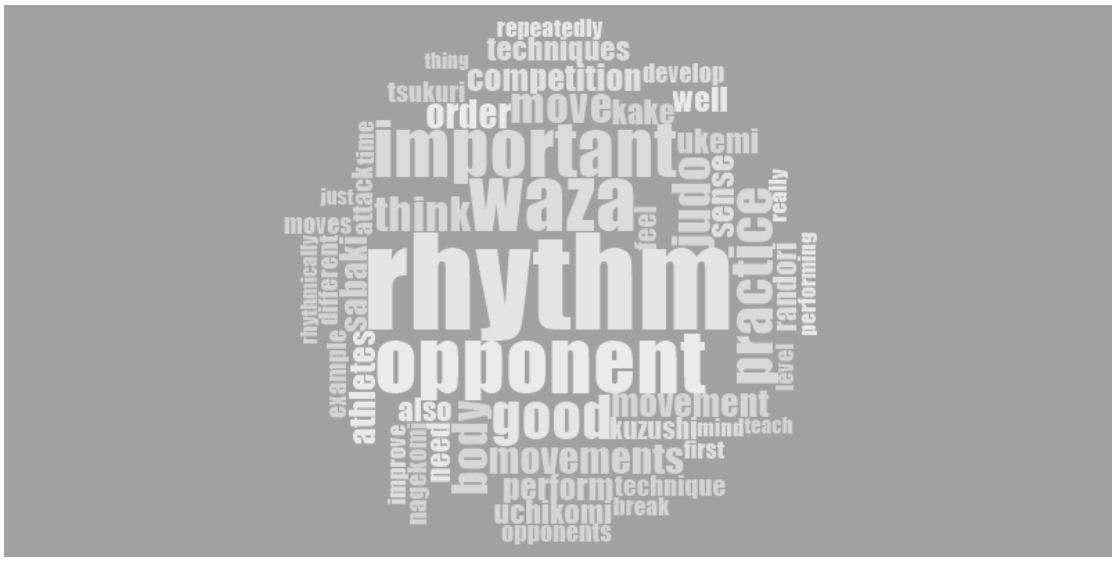
Name	Codes	References
2Mit_transcript	16	39
3Kan_transcript	19	35
6Ino_transcript	21	29
4Yam_transcript	18	28
1mas_transcript	6	12
5Kom_transcript	10	11

The textual elements that were most cited by the interviewees were organised into 55 subcategories, which could be considered as factors influencing the development of rhythm of a judo practitioner.

A word frequency count provides researchers (see Figure 10) with an overall sense of the most common words (Appendix Q) in a data set, document, or text, etc. Words that are repeated frequently are often a topic of focus for the author, so this approach is used for summarisation and topic modelling, among other endeavours (Hai-Jew, 2017, 2020).

Figure 10

Word Frequency Visualisations



‘Sense of rhythm’ was mentioned nine times by the second interviewee, (see Figure 11).

Figure 11

References per Interviewee per Subcategory

	1mas_transcript	2Mit_transcript	3Kan_transcript	4Yam_transcript	5Kom_transcript	6Ino_transcript
1 : body and mind	1	0	0	4	1	0
2 : body-mind-spirt	0	2	0	0	0	1
3 : automating	0	0	0	0	1	0
4 : humans move	0	0	0	1	0	1
5 : mastering	0	0	0	0	0	1
6 : break opponent rhythm	0	0	3	0	0	3
7 : control opponent	0	0	0	0	1	0
8 : opponent analysis	0	3	0	1	0	0
9 : opponents movement	4	0	3	3	2	0
10 : opponent's rhythm	0	2	1	1	0	0
11 : strength weakness situation	0	0	0	0	0	1
12 : defending rhythm	3	0	1	0	1	0
13 : develop rhythm at young age	0	0	0	1	0	0
14 : how rhythm should define	0	0	1	0	0	0
15 : importance of rhythm	0	0	0	0	0	1
16 : KTK rhythm 1,2,3	1	0	3	0	0	1
17 : lose own rhythm	0	0	0	1	0	0
18 : ne waza rhythm	0	1	0	0	0	0
19 : no practice to improve sense of rhythm	0	0	2	0	0	0
20 : relative situation	0	0	0	0	1	0
21 : rhythm as a flowing water	0	0	3	1	0	0
22 : rhythm as a motivation	0	0	2	0	0	0
23 : rhythm as a second nature	0	0	0	1	0	0
24 : rhythm identification	0	1	1	0	0	1
25 : rhythm in randori	0	0	3	0	0	0
26 : rhythm in to shiai	0	0	1	1	0	1
27 : rhythm in uchikomi	2	0	1	0	0	0
28 : sense of rhythm	0	9	0	2	0	0
29 : synchronizing	0	0	0	1	1	0
30 : various rhythms	0	1	0	0	0	2
31 : efficient taisabaki	0	0	3	0	0	1
32 : smoothly taisabaki	0	0	0	0	0	1
33 : taisabaki and body	0	0	0	1	0	0
34 : taisabaki and posture	0	1	0	0	0	0
35 : taisabaki attack defend	0	0	1	0	0	1
36 : two kinds of taisabaki	0	1	0	0	0	0
37 : legs technique	0	0	0	1	0	0
38 : posture based on fundamental	0	1	0	0	1	0
39 : techniques is circle	0	3	0	0	0	0
40 : time development	0	3	0	0	0	0
41 : counter uchikomi	0	0	0	0	1	0
42 : develop personal style	0	0	0	0	0	1
43 : different partners in randori	0	0	0	0	0	2
44 : feints	0	0	0	1	0	0
45 : highly important	0	0	0	1	0	0
46 : image training	0	0	0	0	0	1
47 : KTK isnt broken up	0	0	1	0	0	1
48 : KTK three movement to one	0	6	1	0	0	1
49 : turn up pressure	0	0	0	0	0	1
50 : world of competition	0	0	0	3	0	4
51 : ukemi connect to technique	0	2	0	0	0	2
52 : ukemi doesn't relate to rhythm	0	0	0	0	1	0
53 : ukemi is circle	0	2	0	0	0	0
54 : ukemi teaching rhythm	1	1	1	3	0	0
55 : ukemi timing	0	0	3	0	0	0

Phase one, data Analysis into Subcategories (Appendix P) and phase two, in this study the mathematical type is introduced (see table 12) in Excel (Version 2010), and the data presented as an absolute number and relative values (%) (Mazzei et al., 2020) .

Table 12

154 Text Elements, Emerged 55 Subcategories as a Percentage

	1Mas		2Mit		3Kan		4Yam		5Kom		6Ino		Textual elements		Number of interviewees	
1: body and mind	1	17%	0	0%	0	0%	4	67%	1	17%	0	0%	6	4%	3	50%
2: body-mind-spirt	0	0%	2	67%	0	22%	0	0%	0	0%	1	33%	3	2%	2	33%
3: automating	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	1	1%	1	17%
4: humans move	0	0%	0	0%	0	0%	1	50%	0	0%	1	50%	2	1%	2	33%
5: mastering	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	1	1%	1	17%
6: break opponent rhythm	0	0%	0	0%	3	0%	0	0%	0	0%	3	50%	6	4%	2	33%
7: control opponent	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	1	1%	1	17%
8: opponent analysis	0	0%	3	75%	0	19%	1	25%	0	0%	0	0%	4	3%	2	33%
9: opponents' movement	4	33%	0	0%	3	0%	3	25%	2	17%	0	0%	12	8%	4	67%
10: opponent's rhythm	0	0%	2	50%	1	13%	1	25%	0	0%	0	0%	4	3%	3	50%
11: strength weakness situation	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	1	1%	1	17%
12: defending rhythm	3	60%	0	0%	1	0%	0	0%	1	20%	0	0%	5	3%	3	50%
13: develop rhythm at young age	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1	1%	1	17%
14: how rhythm should define	0	0%	0	0%	1	0%	0	0%	0	0%	0	0%	1	1%	1	17%
15: importance of rhythm	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	1	1%	1	17%
16: KTK rhythm 1,2,3	1	20%	0	0%	3	0%	0	0%	0	0%	1	20%	5	3%	3	50%
17: lose own rhythm	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1	1%	1	17%
18: *ne-waza* rhythm	0	0%	1	100%	0	100%	0	0%	0	0%	0	0%	1	1%	1	17%
19: no pract to imp sense of rhythm	0	0%	0	0%	2	0%	0	0%	0	0%	0	0%	2	1%	1	17%
20: relative situation	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	1	1%	1	17%
21: rhythm as flowing water	0	0%	0	0%	3	0%	1	25%	0	0%	0	0%	4	3%	2	33%
22: rhythm as motivation	0	0%	0	0%	2	0%	0	0%	0	0%	0	0%	2	1%	1	17%
23: rhythm as second nature	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1	1%	1	17%
24: rhythm identification	0	0%	1	33%	1	11%	0	0%	0	0%	1	33%	3	2%	3	50%
25: rhythm in *randori*	0	0%	0	0%	3	0%	0	0%	0	0%	0	0%	3	2%	1	17%
26: rhythm in *shiai*	0	0%	0	0%	1	0%	1	33%	0	0%	1	33%	3	2%	3	50%
27: rhythm in *uchikomi*	2	67%	0	0%	1	0%	0	0%	0	0%	0	0%	3	2%	2	33%
28: sense of rhythm	0	0%	9	82%	0	7%	2	18%	0	0%	0	0%	11	7%	2	33%
29: synchronising	0	0%	0	0%	0	0%	1	50%	1	50%	0	0%	2	1%	2	33%
30: various rhythms	0	0%	1	33%	0	11%	0	0%	0	0%	2	67%	3	2%	2	33%
31: efficient *tai-sabaki*	0	0%	0	0%	3	0%	0	0%	0	0%	1	25%	4	3%	2	33%
32: smooth *tai-sabaki*	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	1	1%	1	17%
33: *tai-sabaki* and body	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1	1%	1	17%
34: *tai-sabaki* and posture	0	0%	1	100%	0	100%	0	0%	0	0%	0	0%	1	1%	1	17%
35: *tai-sabaki* attack defend	0	0%	0	0%	1	0%	0	0%	0	0%	1	50%	2	1%	2	33%
36: two kinds of *tai-sabaki*	0	0%	1	100%	0	100%	0	0%	0	0%	0	0%	1	1%	1	17%
37: legs technique	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1	1%	1	17%
38: posture based on fundamental	0	0%	1	50%	0	25%	0	0%	1	50%	0	0%	2	1%	2	33%
39: techniques is circle	0	0%	3	100%	0	33%	0	0%	0	0%	0	0%	3	2%	1	17%
40: time development	0	0%	3	100%	0	33%	0	0%	0	0%	0	0%	3	2%	1	17%
41: counter *uchikomi*	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	1	1%	1	17%
42: develop personal style	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	1	1%	1	17%
43: different partners in *randori*	0	0%	0	0%	0	0%	0	0%	0	0%	2	100%	2	1%	1	17%
44: feints	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1	1%	1	17%
45: highly important	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1	1%	1	17%
46: image training	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	1	1%	1	17%
47: KTK isn't broken up	0	0%	0	0%	1	0%	0	0%	0	0%	1	50%	2	1%	2	33%
48: KTK three movement in one	0	0%	6	75%	1	9%	0	0%	0	0%	1	13%	8	5%	3	50%
49: turn up pressure	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	1	1%	1	17%
50: world of competition	0	0%	0	0%	0	0%	3	43%	0	0%	4	57%	7	5%	2	33%
51: *ukemi* connect to technique	0	0%	2	50%	0	13%	0	0%	0	0%	2	50%	4	3%	2	33%
52: *ukemi* doesn't relate to rhythm	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	1	1%	1	17%
53: *ukemi* is a circle	0	0%	2	100%	0	50%	0	0%	0	0%	0	0%	2	1%	1	17%
54: *ukemi* teaching rhythm	1	17%	1	17%	1	3%	3	50%	0	0%	0	0%	6	4%	4	67%
55: *ukemi* timing	0	0%	0	0%	3	0%	0	0%	0	0%	0	0%	3	2%	1	17%
													154			

A computer professional specialising in Excel, analyses and exports data in precedents. Two numbers reflect the dynamics of the responses in relation to created subcategories: textual elements (TE), and number of interviewees (NI). The first indicator (TE) shows the percentage obtained from the base share 154 which is the total number of elements (see Table 11). For example (1: body and mind) six elements give us 4% of 154. The second indicator (NI) shows the percentage interviewees responses rate, (1: body and mind) three interviewees give us 50% of six (Seppänen, 2009).

4.2 NVivo Analysis of 8 Categories

Table 13

Subcategories Grouped into Eight Categories

Categories	Subcategories
1.Humans	1.Automating – TE= 1 (1%) NI= 1 (17%)
	2.Humans move – TE= 2 (1%) NI= 2 (33%)
	3.Mastering – TE= 1 (1%) NI= 1 (17%)
2.Body	4.Body and mind – TE= 6 (4%), NI= 3 (50%)
	5.Body-mind-spirt – TE= 3 (2%) NI= 2 (33%)
3.Opponent	6.Control opponent – TE= 1 (1%) NI= 1 (17%)
	7.Opponent analysis – TE= 4 (3%) NI= 2 (33%)
	8.Opponent's movement – TE= 12 (8%0 NI= 4 (67%)
4.Rhythm	9.Opponent's rhythm – TE= 4 (3%) NI= 3 (50%)
	10.Break opponent rhythm – TE= 6 (4%) NI= 2 (33%)
	11.Strength weakness situation – TE= 1 (1%) NI= 1 (17%)
	12.Defending rhythm – TE= 5 (3%) NI= 3 (50%)
	13.Develop rhythm at young age – TE= 1 (1%) NI= 1 (17%)
	14.How rhythm should define – TE= 1 (1%) NI= 1 (17%)
	15.Importance of rhythm – TE= 1 (1%) NI= 1 (17%)
	16.KTK rhythm 1,2,3 – TE= 5 (3%) NI= 3 (50%)
	17.Lose own rhythm – TE= 1 (1%) NI= 1 (17%)
	18.*Ne-waza* rhythm – TE= 1 (1%) NI= 1 (17%)
	19.No practice to improve rhythm – TE= 2 (1%) NI= 1 (17%)
	20.Relative situation – TE= 1 (1%) NI= 1 (17%)
	21.Rhythm as a flowing water – TE= 4 (3%) NI= 2 (33%)
	22.Rhythm as a motivation – TE= 2 (1%) NI= 1 (17%)
	23.Rhythm as a second nature – TE= 1 (1%) NI= 1 (17%)
	24.Rhythm identification – TE= 3 (2%) NI= 3 (50%)
	25.Rhythm in *randori* – TE= 3 (2%) NI= 1 (17%)
	26.Rhythm in to *shiai* – TE= 3 (2%) NI= 3 (50%)
	27.Rhythm in *uchikom*i – TE= 3 (2%) NI= 2 (33%)
	28.Sense of rhythm – TE= 11 (7%) NI= 2 (33%)
	29.Synchronizing – TE= 2 (1%) NI= 2 (33%)
	30.Various rhythms – TE= 3 (2%) NI= 2 (33%)
5.*Tai-sabaki*	31.Efficient *tai-sabaki* – TE= 4 (3%) NI= 2 (33%)
	32.Smoothly *tai-sabaki* – TE= 1 (1%) NI= 1 (17%)
	33.*Tai-sabaki* and body – TE= 1 (1%) NI= 1 (17%)
	34.*Tai-sabaki* and posture – TE= 1 (1%) NI= 1 (17%)
	35.*Tai-sabaki* attack defend – TE= 2 (1%) NI= 2 (33%)
	36.Two kinds of *tai-sabaki* – TE= 1 (1%) NI= 1 (17%)
6.Technique	37.Legs technique – TE= 1 (1%) NI= 1 (17%)
	38.Posture based on fundamental – TE= 2 (1%) NI= 2 (33%)
	39.Techniques is circle – TE= 3 (2%) NI= 1 (17%)
	40.Time development – TE= 3 (2%) NI= 1 (17%)
7. Breakfalls	41.*Ukemi* connect to technique – TE= 4 (3%) NI= 2 (33%)
	42.*Ukemi* doesn't relate to rhythm – TE= 1 (1%) NI= 1 (17%)
	43.*Ukemi* is circle – TE= 2 (1%) NI= 1 (17%)
	44.*Ukemi* teaching rhythm – TE= 6 (4%) NI= 4 (67%)
	45.*Ukemi* timing – TE= 3 (2%) NI= 1 (17%)
8.Training	46.Counter *uchikomi* – TE= 1 (1%) NI= 1 (17%)
	47.Develop personal style – TE= 1 (1%) NI= 1 (17%)
	48.Different partners in *randori* – TE= 2 (1%) NI= 1 (17%)
	49.Feints – TE= 1 (1%) NI= 1 (17%)
	50.Highly important – TE= 1 (1%) NI= 1 (17%)
	51.Image training – TE= 1 (1%) NI= 1 (17%)
	52.KTK isn't broken up – TE= 2 (1%) NI= 2 (33%)
	53.KTK three movement to one – TE= 8 (5%) NI= 3 (50%)
	54.Turn up pressure – TE= 1 (1%) NI= 1 (17%)
	55.World of competition – TE= 7 (5%) NI= 2 (33%)

Note. TE = Textual Elements, NI = Number of Interviewees

The QSR NVivo software (version 12.0 Pro) was used to analyse the data. In this stage, 55 subcategories were grouped in to 8 categories. The eight categories are: Humans, Body, Opponent, Rhythm, *Tai-sabaki*, Technique, Breakfalls and Training.

The first category is 'Humans'. This includes 4 textual elements divided into 3 subcategories. In the 'Humans' category, the top subcategories were 'Humans Move' mentioned by two interviewees = (33%) and producing two textual elements, then 'Automating' mentioned by one interviewee = (17%) and producing one textual element and finally, 'Mastering' mentioned by one interviewee = (17%) and producing one textual element.

The second category is 'Body'. This includes 9 textual elements divided into 2 subcategories. 'Body and Mind' was mentioned by three of the six interviewees = (50%) and producing six textual elements. 'Body-mind-spirt' was mentioned by two of the six interviewees = (33%) and producing three textual elements.

The third category is 'Opponent'. This includes 17 textual elements divided into 3 subcategories. In the category 'Opponent' were, 'Opponent's Movement' was mentioned by four of the six interviewees = (67%) and producing twelve textual elements. 'Opponent analysis' was mentioned by two of the six interviewees = (33%) and producing four textual elements and 'Control opponent' was mentioned by one of the six interviewees = (17%) and producing one textual element.

The fourth category is 'Rhythm'. This includes 64 textual elements divided into 22 subcategories. 'Rhythm' was mentioned by all six interviewees and generated a variety of subcategories. This reveals how important rhythm is in judo. The interesting point here is that the subcategory 'Sense of Rhythm', was mentioned by two of the six interviewees = (33%) and produced 11 textual elements. 'KTK Rhythm 1,2,3' was mentioned by three interviewees = (50%) and produced five textual elements and 'Defending Rhythm' was mentioned by three interviewees = (50%) and produced five textual elements. All textual elements in relation to rhythm were analysed in order for the researcher to understand the application of rhythm in judo and its extensions.

The fifth category is '*tai-sabaki'*. This includes 10 textual elements divided into 6 subcategories. "Efficient *tai-sabaki*" was mentioned by two of the six interviewees = (33%) and producing four textual elements. '*Tai-sabaki* attack defend'

was mentioned by two of the six interviewees = (33%) and producing two textual elements. The other four (from six) subcategories, ‘Smoothly *tai-sabaki’, ‘Tai-sabaki* and body’, ‘*Tai-sabaki* and posture’ and ‘Two kinds of *tai-sabaki’* , were mentioned by one of the six interviewees = (17%) and producing one textual element.

The sixth category is ‘Technique’. This includes 9 textual elements divided into 4 subcategories. The top sub-category in this category seems to be ‘posture based on fundamentals’ and was mentioned by two of the six interviewees = (33%) and producing two textual elements. ‘Time development’ was mentioned by one of the six interviewees = (17%) and producing three textual elements. ‘Techniques is circle’ was mentioned by one of the six interviewees = (17%) and producing three textual elements. ‘Legs technique’ was mentioned by one of the six interviewees = (17%) and producing one textual element.

The seventh category is ‘Breakfalls’. This includes 16 textual elements divided into 5 subcategories. The top subcategory in the Breakfalls category was “*Ukemi* teaching rhythm” and was mentioned by four of the six interviewees = (67%) producing six textual elements. ‘*Ukemi* connect to technique’ was mentioned by two of the six interviewees = (33%) producing four textual elements. The other three (from five) subcategories, ‘*Ukemi* doesn’t relate to rhythm’, ‘*Ukemi* is circle’ and ‘*Ukemi* timing’ had the same results, were mentioned by one of the six interviewees = (17%) and producing one textual element.

The eighth category is ‘Training’. This includes 25 textual elements divided into 10 subcategories. In the ‘training’ category the top subcategory was “KTK three movement to one” mentioned by three of the six interviewees = (50%) and produced eight textual elements. ‘World of competition’ mentioned by two of the six interviewees = (33%) and produced eight textual elements and ‘KTK isn’t broken up’ mentioned by two of the six interviewees = (33%) and produced two textual elements. ‘Different partners in randori’ mentioned by one of the six interviewees = (17%) and produced two textual elements, the other six (from ten) subcategories, had the same results, were mentioned by one of the six interviewees = (17%) and producing one textual element.

4.3 NVivo Analysis of 4 Themes

The results of the first ten-word frequency query, also considered, in this stage (see Table 14), 8 categories were divided into 4 Themes.

Table 14

First Ten-Word Frequency Query Results

Word	Length	Count	Weighted Percentage (%)
rhythm	6	81	4.65
opponent	8	51	2.93
waza	4	50	2.87
important	9	44	2.52
good	4	33	1.89
practice	8	32	1.84
judo	4	27	1.55
body	4	25	1.43
move	4	24	1.38
think	5	24	1.38

4.3.1 Thematic analysis

The first stage of analysis revealed 55 subcategories which, at the second stage of analysis, were grouped into eight categories. According to research literature, the above categories could be divided into four themes: Humans movement, Rhythm in judo, Technical skills, and Pedagogical approach (Appendix R).

The following table demonstrates the general view of fifty-five subcategories were grouped into eight categories and divided into four themes (see Table 14), data presented as absolute number and relative values (%).

The researcher brings to the research 45 years of experience was able to see first-hand the connection between textual elements and the creation of themes. The experience allowed a rich interpretation of the responses, following the IPA coding method based on the frequency of the textual elements.

Table 15

Analysis of Themes

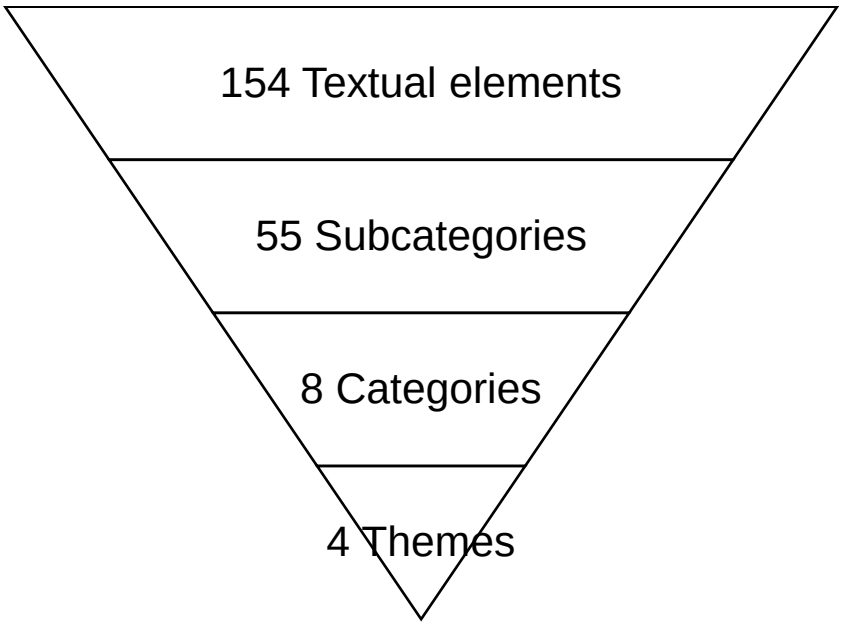
Themes	Categories	Subcategories
1.Humans movement	1.Humans – TE= 4 (3%)	1.Automating – TE= 1 (1%) NI= 1 (17%) 2.Humans move – TE= 2 (1%) NI= 2 (33%) 3.Mastering – TE= 1 (1%) NI= 1 (17%)
	2.Body – TE= 9 (6%)	4.Body and mind – TE= 6 (4%), NI= 3 (50%) 5.Body-mind-spirt – TE= 3 (2%) NI= 2 (33%)
	3.Opponent – TE= 17 (16%)	6.Control opponent – TE= 1 (1%) NI= 1 (17%) 7.Opponent analysis – TE= 4 (3%) NI= 2 (33%) 8.Opponent's movement – TE= 12 (8%0 NI= 4 (67%)
2.Rhythm in judo	4.Rhythm – TE= 64 (44%)	9.Opponent's rhythm – TE= 4 (3%) NI= 3 (50%) 10.Break opponent rhythm – TE= 6 (4%) NI= 2 (33%) 11.Strength weakness situation – TE= 1 (1%) NI= 1 (17%) 12.Defending rhythm – TE= 5 (3%) NI= 3 (50%) 13.Develop rhythm at young age – TE= 1 (1%) NI= 1 (17%) 14.How rhythm should define – TE= 1 (1%) NI= 1 (17%) 15.Importance of rhythm – TE= 1 (1%) NI= 1 (17%) 16.KTK rhythm 1,2,3 – TE= 5 (3%) NI= 3 (50%) 17.Lose own rhythm – TE= 1 (1%) NI= 1 (17%) 18.*Ne-waza* rhythm – TE= 1 (1%) NI= 1 (17%) 19.No practice to improve rhythm – TE= 2 (1%) NI= 1 (17%) 20.Relative situation – TE= 1 (1%) NI= 1 (17%) 21.Rhythm as a flowing water – TE= 4 (3%) NI= 2 (33%) 22.Rhythm as a motivation – TE= 2 (1%) NI= 1 (17%) 23.Rhythm as a second nature – TE= 1 (1%) NI= 1 (17%) 24.Rhythm identification – TE= 3 (2%) NI= 3 (50%) 25.Rhythm in *randori* – TE= 3 (2%) NI= 1 (17%) 26.Rhythm in to *shiai* – TE= 3 (2%) NI= 3 (50%) 27.Rhythm in *uchikom*i – TE= 3 (2%) NI= 2 (33%) 28.Sense of rhythm – TE= 11 (7%) NI= 2 (33%) 29.Synchronizing – TE= 2 (1%) NI= 2 (33%) 30.Various rhythms – TE= 3 (2%) NI= 2 (33%)
3.Technical skills	5.*Tai-sabaki* – TE= 10 (8%)	31.Efficient *tai-sabaki* – TE= 4 (3%) NI= 2 (33%) 32.Smoothly *tai-sabaki* – TE= 1 (1%) NI= 1 (17%) 33.*Tai-sabaki* and body – TE= 1 (1%) NI= 1 (17%) 34.*Tai-sabaki* and posture – TE= 1 (1%) NI= 1 (17%) 35.*Tai-sabaki* attack defend – TE= 2 (1%) NI= 2 (33%) 36.Two kinds of *tai-sabaki* – TE= 1 (1%) NI= 1 (17%)
	6.Technique – TE= 9 (6%)	37.Legs technique – TE= 1 (1%) NI= 1 (17%) 38.Posture based on fundamental – TE= 2 (1%) NI= 2 (33%) 39.Techniques is circle – TE= 3 (2%) NI= 1 (17%) 40.Time development – TE= 3 (2%) NI= 1 (17%)
4.Pedagogical approach	7. Breakfalls – TE= 16 (11%)	41.*Ukemi* connect to technique – TE= 4 (3%) NI= 2 (33%) 42.*Ukemi* doesn't relate to rhythm – TE= 1 (1%) NI= 1 (17%) 43.*Ukemi* is circle – TE= 2 (1%) NI= 1 (17%) 44.*Ukemi* teaching rhythm – TE= 6 (4%) NI= 4 (67%) 45.*Ukemi* timing – TE= 3 (2%) NI= 1 (17%)
	8.Training – TE= 25 (18%)	46.Counter *uchikomi* – TE= 1 (1%) NI= 1 (17%) 47.Develop personal style – TE= 1 (1%) NI= 1 (17%) 48.Different partners in *randori* – TE= 2 (1%) NI= 1 (17%) 49.Feints – TE= 1 (1%) NI= 1 (17%) 50.Highly important – TE= 1 (1%) NI= 1 (17%) 51.Image training – TE= 1 (1%) NI= 1 (17%) 52.KTK isn't broken up – TE= 2 (1%) NI= 2 (33%) 53.KTK three movement to one – TE= 8 (5%) NI= 3 (50%) 54.Turn up pressure – TE= 1 (1%) NI= 1 (17%) 55.World of competition – TE= 7 (5%) NI= 2 (33%)

4.3.2 The results in a pyramid form

The textual elements created from the interview data analysis, referred as textual elements (TE) and a number of interviewees referred as (NI) emerged as subcategories, categories and themes, (see Figure 12).

Figure 12

Thematic Analysis Progress

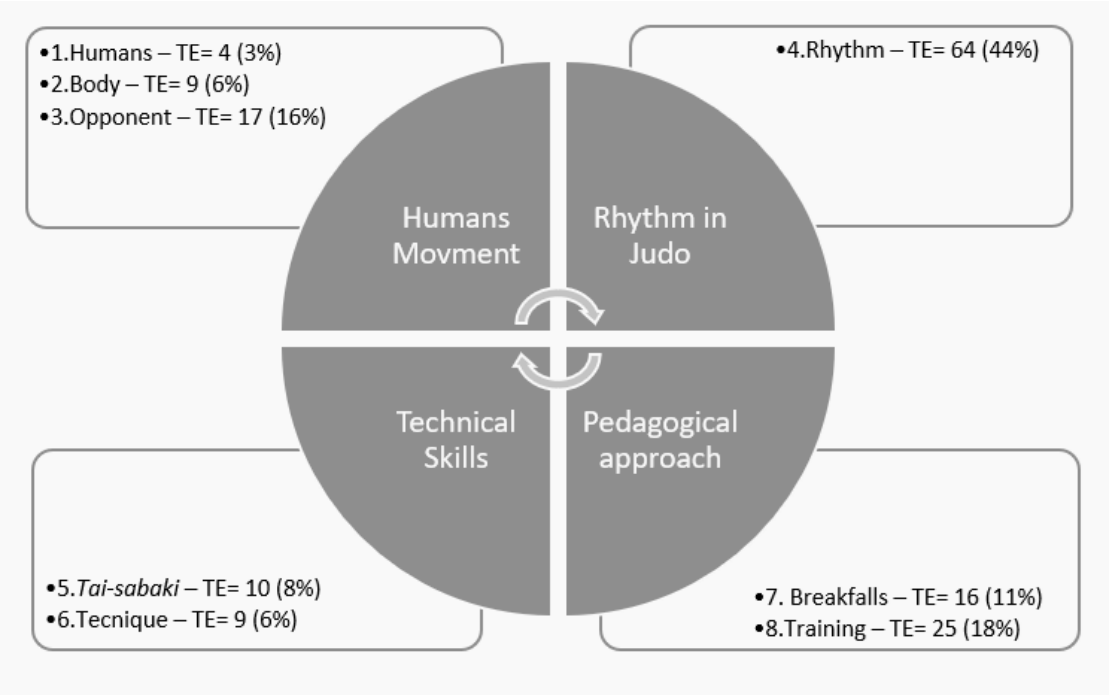


4.4 Diagrammatic Model Results

A diagrammatic model was developed in order to better make sense of, and visually illustrate, the themes in relation to each other, based on the recommendations of researchers to use a graphic depiction when analysing larger samples (see Figure 13), (Eatough & Smith, 2008; Larkin & Thompson, 2012).

Figure 13

Model Related to Themes Structure



4.5 Themes Results Analysis Model

The analysis used in this study has been developed and can be understood in three ways, a) NVivo analysis model b) Themes table, c) Diagrammatic model. The diagrammatic model resulted from the data processing process and describes the relationships between themes. It was conceived in accordance with the high level of the participants, the data interpretation and organised around thematic areas in order to provide a general structure for the diagrammatic model and the theme table.

4.5.1 Humans movement

In subcategories, ‘Control opponent, ‘Opponent analysis, and ‘Opponent’s movement’, the human factor was the most frequently mentioned, with 17 text elements mentioned by participants. The interviewees also emphasised the importance of envisaging their opponent’s rhythm in all stages of training and during competition. For example, in the subcategory ‘Opponent’s movement’, four out of the six participants mentioned action of some kind by the opponent.

“Depending on the opponent’s movement, you should take rhythm into account when doing tai-sabaki” (Interviewee 1).

“If you perform a waza without any prior movement, your opponent will counter. But if you perform a waza having built up a rhythm, your opponent won’t be able to anticipate the technique (waza) you are going to use and therefore will find it difficult to counter” (Interviewee 1).

“You should have a good grasp of your opponent’s usual movement, that is to say their rhythm, and anticipate their movement” (Interviewee 3).

“Also, you can use feints and learn to get a feel for your opponent’s movements in randori practice both of which are also very important” (Interviewee 4).

"There are two ways. The first is to anticipate your opponent's attack move - predict the waza. The second is defending yourself against and controlling your opponent's move, grapple" (Interviewee 5).

The interviewees mentioned human or opponent movement as being very important in judo. An opponent moves in all directions, so practitioners need to have a good understanding of a human's movements.

"Judo is about opponents, human opponents, so you need to have a good understanding of a human's movements. Humans move forwards, backwards, sideways, diagonally. Your opponent will move in those ways and their balance will also adjust itself. If you feel those movements in your own body it will empower you, and that is very important in judo" (Interviewee 4).

"They may have been a few times, when something unexpected threw me off-balance psychologically and suddenly prevented me from making the move I wanted, but basically I think that humans move in ways that they are used to or have experience with. (Interviewee 6).

4.5.2 Rhythm in judo

In this category most of the data reveals that all interviewees mentioned the importance of rhythm in judo. This extensive reference to rhythm shows the importance that Japanese teachers attach to rhythm in judo.

"Sense of rhythm should not just be treated as an important aspect but thought of as second nature" (Interviewee 4).

"When I teach, I first get the students to work on various rhythms via the same training programme" (Interviewee 2).

"When doing judo considering and developing various ideas during regular practice sessions and then putting them into practice and then using things learned in daily practice sessions in competition is very important in order to improve" (Interviewee 2).

"Good rhythm feels good and can be motivating and makes it easier to do repeated practice" (Interviewee 3).

"Repetition in practice is easy and so if your rhythm is good you can practice for longer" (Interviewee 3).

Tai-sabaki is fundamentally one of the most important actions in judo. Basically, all starts and finishes are based on *tai-sabaki*, teachers mention the important role of *tai-sabaki* in the fundamentals of judo. Most of the coaches are more familiar with *tachi-waza* (standing position) *tai-sabaki* but there are two kinds, as can be seen below.

"I think that there are two kinds of tai-sabaki, tachi-waza tai-sabaki and ne-waza tai-sabaki" (Interviewee 2).

Tai-sabaki is also connected with the correct position of the body, and is also something all coaches in Japan and high-level teachers consistently commented on - correct posture means effective defense and positive attack.

"Tai-sabaki is very important for maintaining correct posture when performing waza on your opponent or defending yourself from their waza" (Interviewee 2).

"Tai-sabaki is used when attacking and defending, because it's important that you don't move your body unnecessarily" (Interviewee 3).

"It's also important in order for defending yourself against your opponent's waza effectively, and important before performing a waza when throwing your opponent off balance" (Interviewee 6).

Technique is effective when an athlete performs a specific action as though it were second nature. For example, repetitive movement improves the level of technique. So, rhythm, *tai-sabaki* and technique, are the three elements a judo practitioner needs to perform successfully.

"In order for athletes to improve their technique, it is exceedingly important that they repeatedly practice and gain a firm understanding of the logic of the fundamental principles of judo shizen-tai (natural posture), jigo-tai (defensive posture), way of walking, control of your body turns" (Interviewee 2).

"to get a student to develop into a good athlete quickly in a short time, the teacher should look out for good rhythm in ne-waza or tachi-waza and focus on the techniques which are best rhythmically" (Interviewee 2).

4.5.3 Technical skills

By structuring the study goals and the topics that guided the data collection, the following categories were established: training, quality, and results. The training category included a large number of elements such as *ukemi, kuzushi, tsukuri, kake, randori, shiai,* image training, feints, and competitions.

"When teaching ukemi teaching rhythm to beginners during practice is particularly important from the point of view of judo technique" (Interviewee 2).

"Instructor's advice is very important in order to improve. But in order to further improve your abilities and performance, you need to think things out for yourself - develop your own individual style" (Interviewee 6).

"Basically, through judo not only are we learning and applying techniques for protecting the body, and strengthening the spirit, we are also part of the world of competition" (Interviewee 6).

4.5.4 Pedagogical approach

The data analysis identified that the interviewees considered spirit, culture and focus during the training simulation to real fight, as important for the achievement of international sporting success. During the researcher's one month visit to Tokai University, November 2018, for a coaching seminar entitled "Coaching Juniors", the main teacher, Kenji Mitsumoto, commented that "the three elements that make a champion are environment, coach and motivation" (K. Mitsumoto, personal communication, November 20, 2018), the three elements 'environment' 'coach' and 'motivation' are analysed below:

‘Environment’ is the place of training. Coaches and players from all over the world choose Japan for part of their training. The reasons are, training is like a war atmosphere, *kiai* is a Japanese term for the abrupt cry uttered when performing an attacking move. Japanese athletes are really dedicated to training time. Only in Japan can six to eight world and Olympic medalists be found training on the same mat on a daily basis. Japan won 120 gold medals in the World Championships and Olympic Games between 1956-2004. The country second on the list is France with 39 gold medals (see table 4), less than half the number won by Japan, and this is due to training and environment quality.

A ‘coach’ plays a major role in the education of a judo practitioner, judo is like an alphabet, good coaches teach all the letters in the right order to create elite players, in other words, a poor coach leads to a poor player *“All judo techniques form a circle. Throwing an opponent is also a circle. All judo techniques are circular in form”* (Interviewee 2) which also connects to rhythm, *“Although teachers should research a good training programme for their students, the students should also learn to develop their own sense of rhythm from that programme”* (interviewee 2). *“The instructor’s advice is very important in order [for the judo practitioner] to improve”* (Interviewee 6).

‘Motivation’ is linked with ‘Environment’. Even if the practitioner works with accomplished partners, trains with an experienced coach, and uses modern facilities, without motivation they are just like an expensive car with no gasoline in it to propel it forward, the important role of coach in athlete motivation leads to the conclusion that everything is interconnected. *“It’s important that teachers analyze that and avoid teaching the students the same way so that their students who are aiming to become top athletes develop a different sense of rhythm”* (Interviewee 2). *“I think that while practicing repeatedly with one partner is a good thing, it is also important to partner other judo practitioners to try out various ideas in different situations and with different people. So, in randori etc. it’s not solely about ippon with one partner, I think it’s important to consider different patterns and evaluating them through practice”* (Interviewee 6). *“Basically, through judo not only are we learning and applying techniques for protecting the body, and strengthening the spirit, we are also part of the world of competition. Aside from the techniques mastered in randori, I*

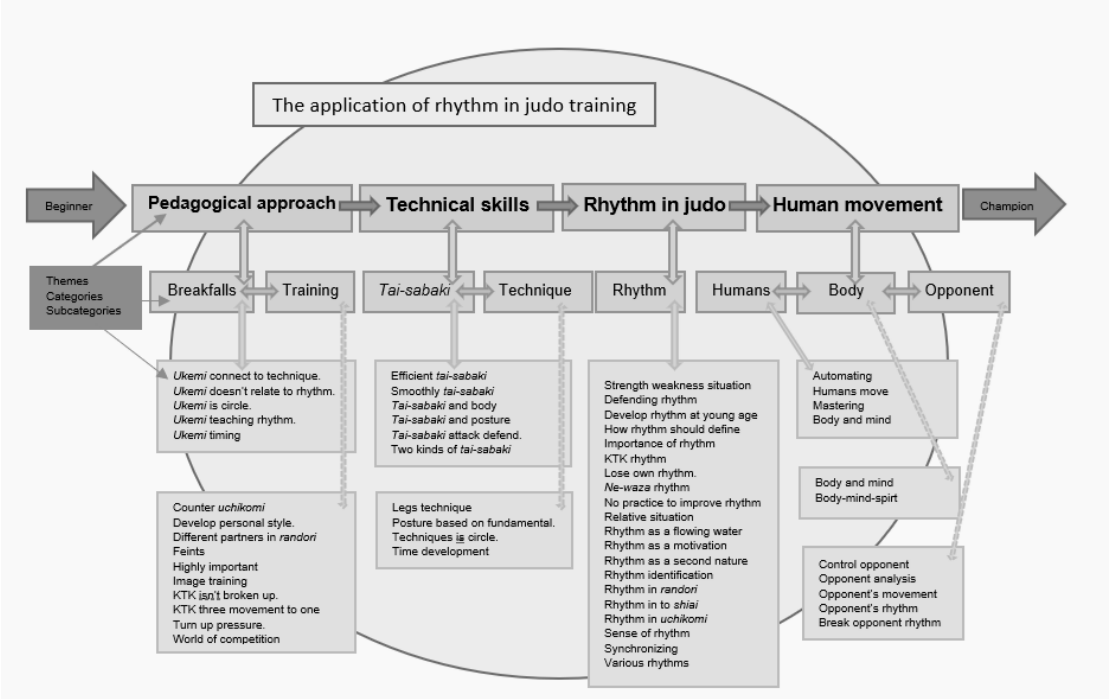
constantly looked ahead and considered what I needed to take through to competition level from that which I learned in practice" (Interviewee 6).

4.6 The Application of Rhythm in Judo Training

The diagrammatic model shows the general view of the findings at all stages of data processing, to better make sense and visually illustrate, the subcategories, categories and themes in relation to each other (Larkin & Thompson, 2012). The model also shows the path from beginner to champion base on the four themes (see Figure 14).

Figure 14

Diagrammatic Model Analysis



4.6.1 Diagram analysis

By analysing an element within a model, we can know its relationships with the other elements, the researcher analysed the model that emerged from the data in order to visualise its related elements. The term "related" here represents any kind of connection that connects the elements. Across all sports, coaches ask themselves the question of how a beginner should start? The common answer is that depending on the sport and the experience of the coach there may be different approaches. Based on this unique study, a pioneering training method has emerged for the first time that can be applied not only to the sport of judo, but to all sports.

4.6.1.1 Pedagogical approach

The pedagogical approach with which the coaches should teach is one of the four important elements that emerged from the interviews with the expert teachers. Statements such as "developing a personal style" and "coach should teach 70% and the remaining 30% is for athletes to develop" or "imagery training" illustrate the characteristic of the pedagogical approach that can be clearly seen and connects athletes with the next level, which is skills. In a few words, in this stage of the model that is presented as "pedagogical approach", the coach must prepare the participant for the transition from citizen to athlete. Judo is a system of physical and moral education, it provides mental discipline, a code of ethics, a way of living and a contribution to society through practitioner perfection.

4.6.1.2 Technical skills

According to the expert teachers, “body movement” and “posture” are the base to build strong and effective technique, the researcher realised that they are also the fundamental base for every sport. Technical skills are something that athletes learn (as an introduction) in the first stage and improve at the second stage and maybe for the rest of their sports career. Through improvements in technical ability the athletes

understand the sport, perceive the competitive environment better, become faster, with soft movements, which through repetition brings them closer to the next stage, which is rhythm.

4.6.1.3 Rhythm in judo

Another important element that emerges from the research is that of rhythm, more specifically "various rhythms" as the diagram shows. They stated, “develop rhythm at a young age”, this is the evidence of how much Japanese high-level teachers count on rhythm as a developmental tool. The interviewees mentioned “rhythm as a flowing water”, showing apart from application in training there is also a philosophical background connected to education and therefore to pedagogy. The subcategories shows that many important things emerged that the coaches of all different sports will have to rethink and take into account such as “rhythm as a motivation”, “rhythm as a second nature” and “sense of rhythm”.

4.6.1.4 Human movement

One of the judo principles, *ju*, is for the defender to mirror the attacker’s movement or strength and use it against him. To do that effectively athletes need skills such as body control, balance, softness, harmony, “*ritsu*” (rhythm), timing and a good understanding of “*ma-ai*” (space between two opponents). Those skills are connected with movement and in this final stage as the diagram path shows, the emergent method creates complete athletes in “body-mind-spirit” (*shin-gi-tai*), which can be applicable to all sports.

4.7 Chapter Conclusion

Data analysis revealed an array of unique points for the sport of judo, there were 154 textual elements made across the six interviews, which were categorised into 55 different sub-categories. Base on how many times those elements (see Figure 11) were mentioned (Seppänen, 2009) across the six interviews, 55 sub-categories emerged, for example, “Sense of rhythm” 11 times, “KTK three movement to one” 8 times, and “Opponent’s movement” 12 times.

55 subcategories were grouped in to 8 categories base on percentages (Mazzei et al., 2020), 1) Humans 2) Body 3) Opponent 4) Rhythm 5) *Tai-sabaki* 6) Technique 7) Breakfalls 8) Training (see Table 12).

The results of the first ten-word frequency query were also considered and 8 categories were divided into 4 Themes (see Table 13).

Finally, a diagrammatic model was developed in order to better make sense of, and visually illustrate (see Figure 22), the themes in relation to each other, (Smith et al, 2009). A different model also shows (see Figure 23), the application of rhythm in judo training, the path from beginner to champion based on the four themes.

CHAPTER V: DISCUSSION

5.1 Restatement of the Research Problem

This study produced useful insights into how a group of high-level judo teachers perceive the application of rhythm in judo, and how they evaluate rhythm in the context of an athlete's daily life of and in their personal development.

The interviews and codification process have revealed a number of important and unexpected insights, in both the application of rhythm in judo and judo itself as a pedagogical tool.

The discussion chapter mostly follows the organisation of the topic areas established by the diagrammatic model (see Figure 23), which can be considered as a 'guideline' to the significant phenomena related to rhythm in judo. The personal significance of rhythm in judo was evidenced by the frequency with which they referred to it naturally during the interviews. Interviewees mentioned that it is important for rhythm to be second nature. Rhythm was also described as an integrated and representative element in the context of training. This framework was seen as essential in providing the reader with a contextualised understanding of the phenomena considered vital to this research.

Interviewees reported various motives for pursuing the continuance of rhythm training. These included faster technical development, better attack or defence, fitness, speed, skills acquisition, personal and spiritual growth, and competition results.

This study sought to explore 1) how high-level teachers perceive the contribution of rhythm in the first steps of the practitioners? 2) how high-level teachers evaluate the importance of rhythm in *randori* and its relationship in daily training? and 3) how do top-level players use rhythm for offence/defence?

5.2 Summary of the Findings

One element that was discussed by a large number of the interviewees is that of *ukemi*, and their contribution to rhythm or even to technique in general. Another finding is the pedagogical approach, and how coaches encourage students to try and improve their technique, also the training process provides practitioners with the philosophical and fundamental principles of judo. Identification of rhythm in judo was another important finding, not only for the present study but for the judo community in general. The contribution of rhythm to technical skills using posture and body movement rhythmically, and the important role of rhythm in judo performance. Leggett (1982) in the book "*Kata Judo*" wrote: "*Uki-otoshi* is the simplest of throws in principle - rhythm is imposed on *uke,* and then the very long step breaks the rhythm and *uke* cannot recover psychologically in time to adapt." (Leggett & Kano, 1982). The result of this study, rhythm in judo can be defined as "the imposition of movement to create an effective attack".

The researcher along with the respondents have immersed themselves in the cultural framework that defines the sport based on their long journey along the way of judo. Building on experience and knowledge, the researcher reflected that by contextualising the research within the cultural framework a new training method can be created with the goal of progress in the sport.

5.3 Discussion of the Diagrammatic Model

5.3.1 The contribution of pedagogy to the practitioners first steps

Pedagogy and training method (Pereira et al., 2021), are two sides of the same coin. Jigoro Kano mentioned many times the importance of judo as a 'way'. The philosophical part of judo is in every stage of the development of an athlete and this can be seen by the fact that the high-level teachers mentioned it a number of times during the interviews. *"When a teacher instructs students, they shouldn't teach 100% of the time, 70 - 80% should be teaching but the remaining 30% is down to the students*

themselves", "Even if they got lucky and won a gold medal, if their heart is not in it, they won't become a gold medal winner in life", "Teachers should not limit themselves to technical instruction, if they fail to provide instruction that embraces the human side as well, then the athlete won't succeed as they should" (Interviewee 2). *"At competition level, it enables you to give your best performance or, depending on how you disrupt your opponent's performance, enables you to perform in a way that is beneficial. This is not just limited to judo or sports but is also found at work and other aspects of life"* (Interviewee 6). Pedagogy is the tool to create people with strong characters useful for society, according to Kano the aim of judo is for people to perfect themselves and contribute to society (Kano, 1932). Another equally valuable pedagogical approach and teaching method is the guidance from an early age to teach children to arrange and take care of their things such as their judo uniform and belt. This is a step forward and will lead them in future to have the right habits, for example, a good diet. Through regular training children also learn to have a daily procedure as they grow up.

"Training is improved, not by changing everything a judo exponent does, but by changing very specific and relatively small details that may consume only a part of his time" (Ishikawa & Draeger, 2011). A similar idea can also be seen in the following quote by Interviewee 3, *"I normally teach the same thing at first but also point it out if it is better they focus on a certain technique".* The importance of details is what will make the difference preparing for *shiai* in high-level competitions.

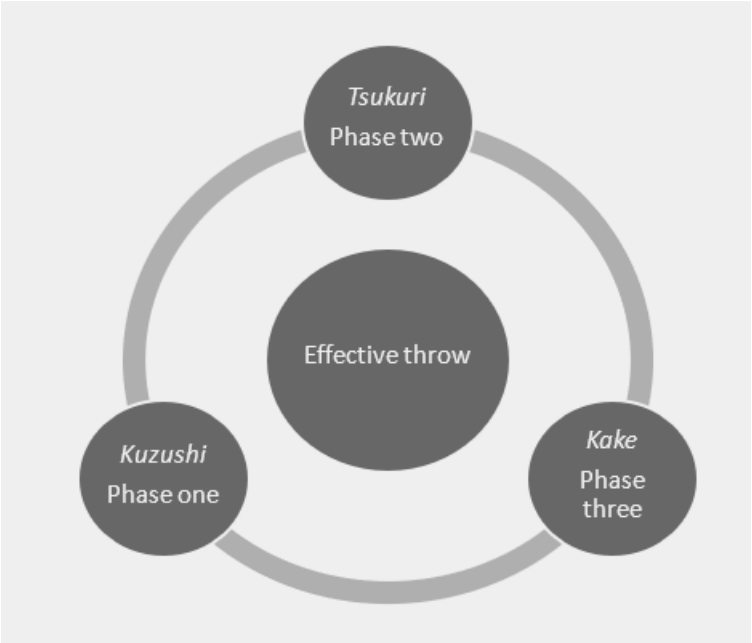
The coding processes revealed a variety of teaching processes that are based on rhythm, *"...good rhythm occurs when kuszushi, tsukuri and kake timing is smooth"* (Interviewee 3*). "One more thing, which includes randori - I think that while practicing repeatedly with one partner is a good thing, it is also important to partner other judo practitioners to try out various ideas in different situations and with different people"* (Interviewee 6). The teaching process should adhere to a defined methodological, pedagogical, and didactic programme that has been adjusted. The creation of a positive environment and encouragement require special attention (Bradić, 2018; Pereira et al., 2021; Vladimirovna, 2020). The teaching processes, or pedagogy used by judo teachers need to be based on rhythm and correct timing (Warner & Kanamaru, 2018).

The subcategory "KTK three movement to one" refers to three important elements which are inextricably linked as one*: kuzushi* (balance breaking), *tsukuri*

(set-up to execute), *kake* (execution of technique). *"Kuzushi, tsukuri, kake are one separate movement connected to make up one movement"* (Interviewee 2), *"kuzushi, tsukuri, kake, they can't be split into three separate entities. Top-level athletes are able combine them into one"* (Interviewee 2). The dynamic of this subcategory is shown in three separate interviews which revealed eight textual elements (see Figure 16). Without these three elements there is no score, so it's an important point that all coaches need to consider (Jones, 2018). What is apparent from this research is that all three elements are part of a whole and need to be practised together (Imamura, 1997). Based on the researcher's experience talking with high-level teachers in Japan they state that the didactic of a technique should be broken into at least 3 parts, *kuzushi*, *tsukuri* and *kake* and then mastered into one to product effective throw (see Figure 15).

Figure 15

Effective Throw



Emergent from the research, an approach to three stages of teaching *kuzushi*, *tsukuri* and *kake* is presented below. The table demonstrates a teaching method breaking down *kuzushi*, *tsukuri* and *kake* into 9 parts (see Table 15).

Table 16

Example of Teaching Kuzushi, Tsukuri, Kake

Phase one	**Phase two**	**Phase three**
Kuzushi (not just as pull)	*Tsukuri* (not just as lift)	*Kake* (not just as throwing)
static	**moving**	**mastering**
Kumikata (griping)	*Tai-sabaki* (body movement)	All three phases into one
Ma-ai (distance)	Entrance to the technique	Driving
Hiki-dashi (pulling from base)	Lift *uke*	Control for transition

From the biomechanical point of view, Sacripanti (2010) investigated *kuzushi-tsukuri* and interaction in competition, the comparative biomechanical analysis of the *kuzushi* (unbalancing) - *tsukuri* (the entry phases of judo throwing techniques). He identified the existence of two classes of action, the first of which is tied to whole-body motion and is particular to shortening the distance in the *kuzushi-tsukuri* phase. The second, the specific action, is linked to the motion of the superior and inferior kinetic chains, as well as correct body positioning, which is linked to both the *kuzushi* and *tsukuri* phases (Sacripanti, 2010).

A key finding that emerges from the research is the importance of *ukemi*. It's clear that *ukemi* is a key responsibility for the judo teacher. All six interviewees mentioned the importance of *ukemi* for various reasons such as safety, creativity of the *uke* (partner), timing, and rhythm. Four out of the six interviewees mentioned *ukemi* as a method to teach practitioners rhythm at early stage. The subcategory "*ukemi* teaching rhythm" revealed six textual elements: *"Rhythm is necessary for the timing of the slapping of the hand on the tatami mat"* (Interviewee 1), *"When teaching ukemi, teaching rhythm to beginners during practice is particularly important from the point of view of judo technique"* (Interviewee 2), *"I think that ukemi and rhythm are connected"* (Interviewee 3), *"The reason for that is that ukemi is associated with the*

same repetitive movements so rhythm is very important when it comes to teaching your body to familiarize itself with those movements" (Interviewee 4). "*Ukemi* connect to technique" is something that is not heard in dojos. *"Teaching ukemi to beginners is a very important thing for judo technique"* (Interviewee 2), *"I think ukemi and waza (technique) in judo incorporate rhythm"* (Interviewee 6).

Ukemi was mentioned by a large number of the interviewees, and their contribution to rhythm or even to technique in general. There have also been concerns as to whether the breakfalls are really related to rhythm at all, "*where fundamental techniques are concerned, ukemi doesn't relate to rhythm. It's solely protection of one's body"* (Interviewee 5). The majority of interviewees, however, refer to a relationship between rhythm and breakfalls, "*when teaching ukemi teaching rhythm to beginners during practice is particularly important from the point of view of judo technique"* (Interviewee 5), "*I think that ukemi and rhythm are connected"* (Interviewee 2), *"Yes, I think ukemi relates to rhythm"* (Interviewee 4), "*The reason for that is that ukemi is associated with the same repetitive movements so rhythm is very important when it comes to teaching your body to familiarize itself with those movements"* (Interviewee 4)*, "take, for example, ushiro-ukemi. When you roll over and hit your hand down, normally your body and head fall back doesn't it? Your neck and your head, that is. You actually need to move them in the other direction and so it's necessary to practice those movements repetitively and it's important to do this rhythmically"* (Interviewee 4). Geof Gleeson, was one of the first to question the importance of *ukemi* in judo (Gleeson, 1967), Anton Geesink also questioned the efficacy of *ukemi* (Geesink, 1966), and Gerald LaFon, a former American judo coach, openly doubted the usefulness of *ukemi* to judo (Lafon, 2002). This study finding of the importance of *ukemi* contrasts with some ideas prevalent in the west in recent decades, that to practice *ukemi* is learning how to lose, and that the athlete shouldn't breakfall as they will give away an ippon score.

However, there are other equally important elements besides rhythm such as timing, technique, safety, body control and mobility. Timing connects to rhythm; "*rhythm is necessary for the timing of the slapping of the hand on the tatami mat"* (Interviewee 1), *"the reason being, if you don't time ukemi well then it is not very effective, you should hit the tatami with your hand just before your whole back comes into contact with it. In order get the best timing for ukemi, you need to repeatedly*

practice with a good rhythm" (Interviewee 3). The literature supports these findings. Takahashi (2005) mentioned about the importance of timing, "timing and feel that are so important in judo" (Takahashi, 2005). Other research by eight judo experts from five countries assessed the importance of judo throws, the findings showed the importance of motor abilities especially speed, power and timing (Sertić & Segedi, 2012).

5.3.1.1 Technique

Jigoro Kano, explains the importance of *ukemi* in this way: *"As I have often said if one hates to be thrown, one cannot expect to become a master of the art. By taking throws time after time, one must learn how to take falls and overcome the fear of being thrown. Then one will become unafraid of being attacked and be able to take the initiative in attack. Only by following this manner of training can one learn true Judo technique"* (Kano, 2005). As this study has shown, the coaches who participated embrace Kano's statement, and are in agreement with the fact that they consider there to be a connection between breakfalls and technique. This unwillingness to embrace the idea that there is a connection between *ukemi* and technique is a weak point for many coaches around the world who do not consider falls to be significant. "*Teaching ukemi to beginners is a very important thing for judo technique. Improvement of judo techniques necessitates a solid understanding and practice of ukemi"* (Interviewee 2), *"I think ukemi and waza in judo incorporate rhythm, waza (technique) and ukemi (breakfalls) are comprised of rhythm"* (Interviewee 6). The following statement also is related to the technical part of judo, *"the basic principles of ukemi in judo form is a circle, ukemi in judo is circular"* (Interviewee 2).

5.3.1.2 Safety

In a study conducted to evaluate the effectiveness of mastering *ukemi* to prevent serious head injury in judo, an expert *tori* threw an expert *uke* with a specialised *ukemi* four times. Kinematic data on the *uke* was taken digitally. The results showed the necessity of mastering *ukemi* (Murayama et al., 2020). Interviewee 5 supported this, by stating, "*It's solely protection of one's body".*

5.3.1.3 Psychologically

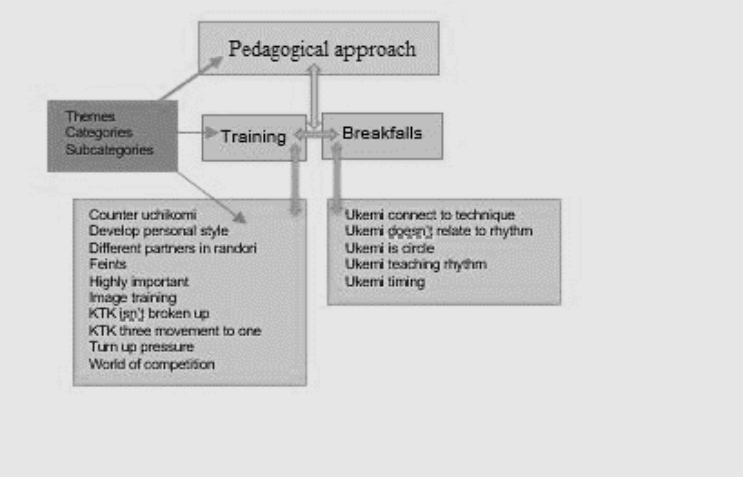
The study of falling in judo around the world, is typically the first thing judo coaches focus on when working with beginners. Before anyone can be expected to participate in *randori* they should develop certain skills and learn to overcome their fears so they can feel comfortable falling. Judo is unique among sports and martial arts in the way it incorporates a scientific approach to the methods of falling called *ukemi* (Ohlenkamp, 2004).

In short, the research shows the involvement of the *ukemi* and their learning with important elements such as rhythm, technique, safety, and timing. *Ukemi* training is considered by both the literature and the respondents to be an important element for an athlete's technical development. However, teachers who participated in this study agree that *ukemi* are a fundamental exercise in judo particularly where beginners are concerned.

In addition to falls, the early stages of judo training involve other forms of practice such as, *uchikomi, tandoku-renshu* (shadow - solo training), *kuzushi, tsukuri, kake* (balance breaking-set-up-execution), among others which are also elements that contribute to the creation of a solid foundation in the development of students (see Figure 16).

Figure 16

Teaching Methods



5.3.1.4 Uchikomi

As the ancient Greeks say, «*Επανάληψις, μήτηρ πάσης μαθήσεως*» (the mother of learning is repetition), or in Latin "*Repetitio est mater studiorum*". It is not just a figure of speech but reality.

The importance of repetition as a learning process has been stated elsewhere in martial arts literature. Parsons (1984) cited 1st century Japanese swordsman Miyamoto Musashi who in A Book of Five Rings (1974, p.53) instructed his readers not only to read, memorise and imitate the principles of martial practice, but also to feel them into their bodies (Parsons, 1985). The value of repetition has also been recognised by both contemporary science and western phenomenology.

The same can be found with judo, where perfection of a technique takes much repetition before it becomes automatic in its application in *randori*. It is indicated that *uchikomi*, despite its limitations, is one of the most important methods for improving in judo (Del Vecchio et al., 2014). Interviewees agree with Del Vecchio, *"you can't really get a rhythm up in randori so for example you can combine more than one*

technique in uchikomi - like renraku-waza where you combine several techniques. You can build up a rhythm through repetitious uchikomi" (Interviewee 1). The interviewees gave various parameters of the application of *uchikomi* such as counter *uchikomi, "Movements in general, fast movements are important. For randori, counter uchikomi is important - uchikomi including counter uchikomi*" (Interviewee 5). A sample of how coaches perceive *uchikomi* in the country where judo was born, can be seen in the following answer, *"When Japanese perform waza, uchikomi and nage-komi are both very important. Especially with Japanese athletes and in Japan uchikomi and nage-komi are regarded as highly important"* (Interviewee 4).

Based on this research, if practitioners have mastered basic moves such as *uchikomi* or *nage-komi*, the next level would be, *"basic moves like uchikomi or nage-komi - or, if you have cleared this level, the next step is to is turn up the pressure a bit. For example, getting your practice partner to put up more of a fight or move a bit more, or getting a third person to join and increase the pressure on you will also help improve waza"* (Interviewee 6). This quote also refers to shadow training by way of *tandoku-renshu*. *"also, image training - putting thought into practice is really important in judo if you want to improve"* (Interviewee 6). Shadow training is useful for the development of technical skills. A judo practitioner simply imagines a person (a shadow) standing in front of them and then trains with that. Shadow training allows a practitioner to practice many different throws, combinations, or even to do shadow *randori*. It is also a perfect way for players to keep training when they are injured.

5.3.1.5 Kuzushi-tsukuri-kake

The Traditional Kodokan pedagogical approach is consistent with the above core principles. The Kodokan considers that there are three essential phases to successfully executing a judo throw – specifically 1) *kuzushi*, 2) *tsukuri,* and 3) *kake* (Jones, 2018).

No matter how familiar one is with these concepts it is not easy to apply them to a long-term training plan, as they require patience and perseverance. However, those three elements are very important in order to get a score. In a few cases, athletes learn about these concepts later on in their careers as seniors and by themselves,

"..kuzushi, tsukuri, kake - perfecting them takes a great deal of practice and time" (Interviewee 2). This happens because the coach first must teach those points separately and then together once learned, "*you should not teach them as a set at first, you should teach each movement separately and thoroughly, then practice the first and then the second, then the second before moving on to the third"* (Interviewee 2).

"Kuzushi, tsukuri, kake are one separate movement connected to make up one movement" (Interviewee 2), "*Once you have mastered and combined these moves, they can be used as part of the renraku waza technique, kuzushi, tsukuri, kake, they can't be split into three separate entities. Top-level athletes are able combine them into one"* (Interviewee 2), *"In order to achieve that, it's very important this is practiced until the moves are completely understood and the body has been taught to remember the moves"* (Interviewee 6).

Rhythm is also part of this preparatory stage of technical development *"The best kuzushi, tsukuri, kake isn't broken up - it can't be clearly broken down into the three separate movements. A really good kuzushi, tsukuri, kake is a flowing, continuous movement and not broken up"* (Interviewee 3*), "good rhythm occurs when kuzushi, tsukuri and kake timing is smooth"* (Interviewee 3).

5.3.1.6 The pedagogical approach

When Jigoro Kano lectured at the University of Southern California on the occasion of 10th Olympiad in 1932 he remarked,

> "let us say that the strength of a man standing in front of me is represented by ten units, whereas my strength, less than his, is represented by seven units. Then, if he pushes me with all his force I shall certainly be pushed back or thrown down, even if I use all my strength against him. This would happen because I used all my strength against him, opposing strength with strength. But if, instead of opposing him, I were to give way to his strength by withdrawing my body just as much as he had pushed, remembering at the same time to keep my balance, then he would naturally lean forward and thus lose his balance. In this new position, he may have become so weak (not in

> actual physical strength but because of his awkward position) as to have his strength represented for the moment by, say, only three units, instead of his normal ten units. But meanwhile, I, by keeping my balance, retain my full strength, as originally represented by seven units. Here then, I am momentarily in an advantageous position, and I can defeat my opponent using only half of my strength, that is half of my seven units, or three and one-half, against his three. This leaves one-half of my strength available for any purpose" (Kodokan, 2015).

"Trainers should be constantly educated in modern pedagogical approaches" (Gorner et al., 2019). There are other pedagogical and didactic approaches such as, *"The instructor's advice is very important in order to improve. But in order to further improve your abilities and performance, you need to think things out for yourself - develop your own individual style"* (Interviewee 6). Or, where *randori* is concerned, judo coaches also encourage students to try and improve their technique by working with different partners and through bowing before and after the rhetoric which gives another pedagogical approach to the first steps of the trainees and will follow them forever, *"One more thing, which includes randori - I think that while practicing repeatedly with one partner is a good thing, it is also important to partner other judo practitioners to try out various ideas in different situations and with different people"* (Interviewee 6*), "In randori etc. it's not solely about ippon with one partner, I think it's important to consider different patterns and evaluating them through practice"* (Interviewee 6). Jigoro Kano stated, "before and after practicing Judo or engaging in a match, opponents bow to each other. Bowing is an expression of gratitude and respect. In effect, you are thanking your opponent for giving you the opportunity to improve your technique" (Daigo, 2005; Kano, 2005), a statement in which the pedagogical character in teaching judo can clearly be seen.

The importance of the data on the pedagogical role of the coach and the students' learning experience is echoed by the martial arts research (Dykhuizen, 2000; Konzak & Boudreau, 1984; Lantz, 2002). The training process provides practitioners with the philosophical and fundamental principles of martial arts through which the skills and the techniques are appropriate and significant. James and Jones (1982) highlighted how socialisation in martial arts imparts physical skills, values, and beliefs. Jigoro Kano explained, "judo is the way to the most effective use of both

physical and spiritual strength. By training you in attacks and defences it refines your body and your soul and helps you make the spiritual essence of judo a part of your very being. In this way you are able to perfect yourself and contribute something of value to the world. This is the final goal of judo discipline" (Kudo, 1967).

In April 2006, the Ministry of Education, Culture, Sports, Science and Technology in Japan, started a project of "introducing *budo* into the elementary school physical education system" in order that judo could contribute to pedagogy in Japan. Okada Elementary School in Joso City was chosen for the assessment, and the project ran for three years. The results of the project show that in a curriculum tailored to the student's physical ability and development, students find judo more interesting and gained a further interest in *budo* overall. Through *ukemi* and *tai–sabak*i practice, students learned how to prevent injuries to their faces, and as a result, the total number of children needing medical care at school decreased. Although this project was completed in March 2009, Okada Elementary decided to continue their judo class under the new name of '*budo* class in physical education' (Ogata, 2013; Takashi Ogata, 2013).

5.3.1.7 Considering future competition

From their very first steps in learning judo, students think about, ask about, and learn about future goals. Their first goal is the acquisition of the next belt color, and the second is to take part in a technical contest - presenting their best *tokui-waza*, for example. "*If they can make those movements, the practitioner will feel that they are performing well, at their own pace, and performing well in the competition*" (Interviewee 4), *"...things you learn in practice will be brought across to competition"* (Interviewee 4). *"Basically, through judo not only are we learning and applying techniques for protecting the body, and strengthening the spirit, we are also part of the world of competition"* (Interviewee 6).

As mentioned above rhythm is a key element in the development of the students in all stages of training right from the outset, and this concept can be seen in the responses of the interviewees, *"the rhythm learnt in practice is necessary to give you an edge in competition"* (Interviewee 4). *"Aside from the techniques mastered in*

randori, I constantly looked ahead and considered what I needed to take through to competition level from that which I learned in practice [sessions]", (Interviewee 6), *"In order to perform well or in order to disadvantage my opponent - if that's the right word - in order prevent them from performing well, I kept rhythm in mind and used it in competition to do the best I could"* (Interviewee 6). *"At competition level, it enables you to give your best performance or, depending on how you disrupt your opponent's performance, enables you to perform in a way that is beneficial"* (Interviewee 6).

5.3.2 The Contribution of rhythm to technical skills

5.3.2.1 Technical Skills

Technical skills are undoubtedly another important point (Jagiello et al., 2014; Sterkowicz et al., 2007), for the development of an athlete and begin with posture. *"In order for athletes to improve their technique, it is exceedingly important that they repeatedly practice and gain a firm understanding of the logic of the fundamental principles of judo - shizentai (natural posture), jigotai (defensive posture), way of walking, control of your body turns"* (Interviewee 2). "In judo it is important you aim to hold your posture in a way so as not to be unbalanced by your opponent" (Interviewee 5).

During the researcher's visit to Tsukuba University for six months in 1989 in their capacity as a judo practitioner, Koji Komata, the highly regarded judo teacher, said that, "without *waza* (technique) there is no score" (K. Komata, personal communication, August 10, 1989). That means that an athlete can lose by being awarded a penalty, or even win as a result of opponent penalties, but that alone is not enough to make a top-level athlete. "In judo we are trying to throw opponent by *ippon* (highest score) *ippon* symbolises opponent death" (K. Komata, personal communication, August 10, 1989).

The results of the interview transcripts and subsequent coding showed the emphasis placed by the interviewees on the importance of the rhythmical movement

of the body (*tai-sabaki*) without the loss of centre of gravity which unbalances the athlete (Rahmawati et al., 2021). The subcategory 'Efficient *tai-sabaki'* reveals that, *"as for how to use tai-sabaki and move your body rhythmically, judo is not just about arm and leg movements, good tai-sabaki comprises arms, legs, body and sometimes head movements. I think that one of the tricks for performing tai-sabaki well is the movement of all parts of the body as one"* (Interviewee 6), *"..that is to say, if you can build up a good rhythm in by repeating tai-sabaki during practice, I think you will develop a better tai-sabaki"* (Interviewee 3).

Interviewees also referred to rhythm and smooth movement of the body using *tai-sabaki,* as well as the usefulness in both defence and attack. *"A good, efficient tai-sabaki is smooth"* (Interviewee 3), *"I think that receptive tai-sabaki will definitely bring out a good rhythm"* (Interviewee 3), *"it's also important in order for defending yourself against your opponent's waza effectively, and important before performing a waza when throwing your opponent off balance"* (Interviewee 6).

Using posture and body movement, martial art literature (Callan, 2018b; Cynarski & Skowron, 2014; Musashi, 2003) refers to three concepts: '*ma-ai', 'hyoshi'* and '*yomi'*. The first, *ma-ai,* is the relative distance between opponents, the second, '*hyoshi*', is the rhythm of the action and the third '*yomi*', is intuition or selection of the right moment. *Tai-sabaki* is linked with these three notions. When a judo practitioner takes action, they will need to ascertain which is the right moment to move their body in order to be in a better position to manipulate the rhythm in their favour. In nowadays competitions, judo practitioners tend to cling to each other which results in very little variation in distance. In such cases, the practitioner needs to break the the practitioner needs to break the *kumikata* (grip) and start or impose a new distance. *Tai-sabaki* plays a major role in this. At times, a small and comparatively weak man would overcome a bigger opponent (Greene, 1987). For better success modifying *hyoshi* or imposing rhythm, judo practitioners need to understand that it is not only speed that will make the difference, they must be in harmony with themselves and with the potential reactions of their opponents. In order to perform a *waza* effectively, the right moment, synchronise *tai-sabaki* and all the body segments for potential use. If synchronised, the element of surprise is lost giving the opponent time to recover and return to a defensive position. As a sport, judo incorporates an assortment of grappling skills that follow basic natural rules. It is a sport in which

skill, timing, leverage, and body positioning are critical to performance (Imamura, 1997).

There are two types of *tai-sabaki*, one, moving from an upright position and two, moving on the ground. Both positions are extremely important for the application of a successful technique, "*I think that there are two kinds of tai-sabaki – tachi-waza tai-sabaki and ne-waza tai-sabaki"* (Interviewee 2). Efficient *tai-sabaki* is smooth, *"in order to perform my waza moves smoothly tai sabaki is important"* (Interviewee 6). There is little literature pertaining to smooth *tai-sabaki*. Most researchers mentioned 'efficient *tai-sabaki*' but, as can be seen in the following statement, *"a good, efficient tai-sabaki is smooth"* (Interviewee 3), a statement which reveals a new element.

Interviewees also mentioned the contribution of *tai-sabaki* to rhythm development, *"That is to say, if you can build up a good rhythm in by repeating tai-sabaki during practice, I think you will develop a better tai-sabaki"* (Interviewee 3), *"..as for how to use tai-sabaki and move your body rhythmically, judo is not just about arm and leg movements, good tai-sabaki comprises arms, legs, body and sometimes head movements. I think that one of the tricks for performing tai-sabaki well is the movement of all parts of the body as one"* (Interviewee 6).

Basic concepts such as movement, body, balance, defense, attack, are perfectly connected to the rhythm, *"..it is important therefore to repeat those movements and teach your body to get a strong feel for them, and tai sabaki can be really helpful in achieving this. Tai-sabaki is very important in learning those movements and therefore rhythm is also important"* (Interviewee 4).

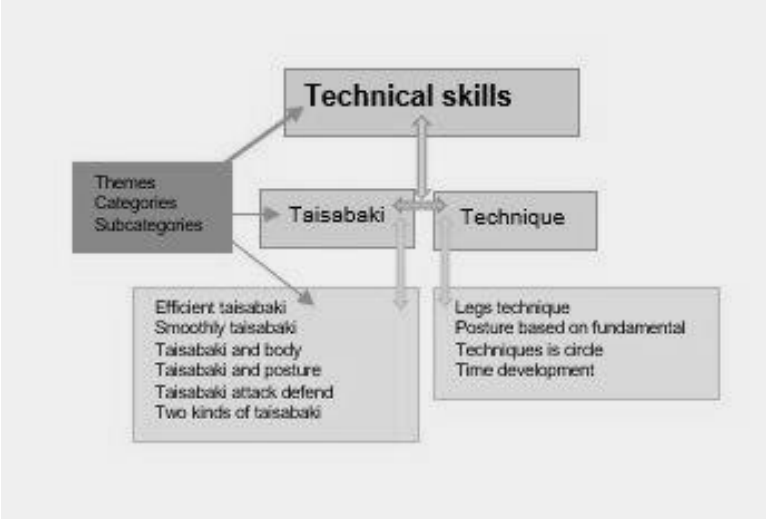
Movement in combination with the correct body posture for effective attack is one think for consideration, *tai-sabaki* with correct posture for defense is another think, *"Tai-sabaki is very important for maintaining correct posture when performing waza on your opponent or defending yourself from their waza"* (Interviewee 2).

'Tai-sabaki' is a multi-purpose tool comprised of a number of important elements: *Tai-sabaki* for saving energy, *tai-sabaki* for defense, *tai-sabaki* for breaking opponent's balance, even *tai-sabaki* for breaking the opponent's grip *"Tai-sabaki is used when attacking and defending, because it's important that you don't move your body unnecessarily"* (Interviewee 3), *"It's also important in order for defending*

yourself against your opponent's waza effectively, and important before performing a waza when throwing your opponent off balance" (Interviewee 6). As Kazuzo Kudo, 9th *dan*, explains, *"do not think of attack and defence as two separate things. An attack will be a defence, and a defence must be an attack"* (Kudo, 1967), (see Figure 17).

Figure 17

Technical Skills



5.3.2.2 Technique

There has been a great deal of discussion about what technique is and what it's not and the International Judo Federation has taken steps to address this issue. In modern judo many athletes have created their own techniques, but the question remains, do they follow the basic principles of judo? In the final -100kg between Suzuki Keiji (Japan) vs Tuvshinbayar Naidan (Mongolian), at the 2008 Beijing Olympic games, Suzuki lost by *morote-gari* (both legs grip) and Tuvshinbayar won gold. Tuvshinbayar caught Suzuki's knees with both hands and pushed him out of the tatami (mat) area which was strange, but that kind of technique was allowed at the

time. After that incident, the IJF amended the rules to prohibit someone grabbing their opponent legs with both hands because the technique used did not follow the judo principle of throwing technique.

The researcher discussed this issue with one of the most prominent Japanese university coaches, Tsukuba university professor, Koji Komata. Komata explained that the issue was related to the basic idea of judo and the question of, 'what is skill?' or 'what is technique?' *"Kano explained the Judo techniques must be applied in accordance with rules of "the principle of 'ju'". It is called now in short "riai", which is principle of using correct, sufficient motion to perform each technique properly with maximum efficiency."* He continued, *"Therefore, we sometimes do not approve the technique which is applied with only arm power or unreasonable fall down. In the competition rule, it is written simply throwing with under control. The world is wide and point of view of wrestle seemed to be accepted widely nowadays, it is no worry. But we must consider again above mentioned what the skill in judo is. Unfortunately, this is from an old Japanese book, but Kano's direct words"* (K. Komata, personal communication, October 05, 2020).

David Matsumoto in his book "An Introduction to Kodokan Judo - History and Philosophy", refers to the basic technical principles in judo, quoting the famous judo master Yoshitsugu (Yoshiaki) Yamashita, explaining what 'technique' is and what it is not. (Matsumoto, 1996), *"The technique and mind are just like the front and back of one's hand, meaning they are very closely related".*

Riai (理合) refers to the rational relationship of interactive movements between oneself and the opponent" (Bennett, 2012). A definition of *riai* is given by Murata Naoki (2011), in his book *"Judo no Kokusaika: Sono Rekishi to Kadai*": '*Riai'* is "the principle of using correct, sufficient motion to perform each technique properly with maximum efficiency" (Kodokan, 2014; Sato, 2013). Murata was born in Japan in 1949, and studied at the Faculty of Physical Education, Department of Martial Arts of the Tokyo University of Education, where, in 1973, he obtained the MA degree in physical fitness. He has coached judo in more than ten countries and was curator of the Kodokan Judo Museum and Library. In July 2008, he was appointed Head of Directors of the Japanese Academy of Budo, and Chairman of the

Education and Proliferation of Judo, Committee of the All-Japan Judo Federation. In 2013, was promoted to 8th dan by the Kodokan.

Kano, (1932) explained in his lecture “The Contribution of Judo to Education”, "let's say we face an opponent with 10 units strength, by giving him a way to step forward, three units is enough to throw him because is out of balance”.

In this study, interviewees responded in a different way when talking about leg techniques. Leg techniques are used to break the opponent’s balance, or as a counterattack, or as a direct attack, *“first it’s probably better for the ashi-waza to be smooth and within leg techniques, ashi-barai, de-ashi-barai and okuri-ashi-barai. The reason I say that is that timing becomes exceedingly important in ashi-barai-waza where power isn’t so effective”* (Interviewee 4). *“In judo it is important you aim to hold your posture in a way so as not to be unbalanced by your opponent”* (Interviewee 5), *“In order for athletes to improve their technique, it is exceedingly important that they repeatedly practice and gain a firm understanding of the logic of the fundamental principles of judo – shizen-tai (natural posture), jigo-tai (defensive posture), way of walking, control of your body turns”* (Interviewee 2).

Japanese teacher’s perception of technique is different than most coaches in Europe. Teachers in Japan see technique as part of a cycle within judo*, “all judo techniques form is a circle. Throwing an opponent is also a circle. All judo techniques are circular in form”* (Interviewee 2). However, there is no specific time for athletes to learn how to use their technique effectively. In most cases it takes years, *“Neither students nor teachers, can set a time for the development of a good athlete”* (Interviewee 2), “*To get a student to develop into a good athlete quickly in a short time, the teacher should look out for good rhythm in ne-waza or tachi-waza and focus on the techniques which are best rhythmically*” (Interviewee 2). The same interviewee detailed his own method of teaching students*, “I normally teach the same thing at first but also point it out if it is better, they focus on a certain technique”* (Interviewee 2).

5.3.3 The Role of rhythm in judo performance

It is generally accepted that rhythm plays an important role in an athlete's performance in all sports. Many sports organisations organise themed camps. In softball and baseball camps, for example, one component of training that is hammered into the children during those camps is that of rhythm. More specifically, rhythm is considered important in games of softball and baseball. The showdown between the pitcher and the batter is like a dance, "the most skilful athletes across all sports move with a sense of grace, coordination, and rhythm" (Lab, 2019). In boxing, Eric C. Stevens refers to rhythm as "rhythm is an athlete" (Stevens, 2020). Track and field coaches state, "there are many elements to developing speed in young athletes, one of the most crucial is rhythm" (LeClair, 2014). In this study, high-level teachers refer to rhythm as something that is second nature *"Sense of rhythm should not just be treated as an important aspect but thought of as second nature"* (Interviewee 4).

Through his experience as a dancer and then as a dance teacher, the researcher concluded that there are two types of people who performed in dance: Those who had innate natural dance skills and those who simply learned the steps. Some students only had to see the steps performed once and they would be imprinted on their minds, while others had to practice them repeatedly. This also applies to judo. There are two types of athletes who perform *uchikomi,* those who only needed to see the steps once before they were imprinted on their minds, and those who needed to practice them repeatedly in order to acquire the proper rhythm (see Figure 19).

"Every athlete has their own sense of rhythm" (Interviewee 2). According to the interviewees who participated in this study, a sense of rhythm is a very important ability for creating great athletes. Interviewee 2 also mentioned that, "*As a teacher I see athletes with varying levels of sense of rhythm - both good and less so*" and followed that with, *"first, in order to train up athletes to win competitions, the athletes need to develop a different sense of rhythm to other athletes. They need to find their own sense of rhythm and teachers need to develop a training programme that encourages that"* (Interviewee 2). The interviewee elaborated by adding that if a judo practitioner has the same rhythm as their opponent, they may not be able to win, *"If you develop the same sense of rhythm as your opponents you won't become a top-*

level athlete, In competition, athletes that reach the top have a very different sense of rhythm different to their opponents" (Interviewee 2). According to Interviewee 2, the support of a coach at this stage is very important for the analysis and design of a training plan to develop players rhythm, *"it's important that teachers analyse that and avoid teaching the students the same way so that their students who are aiming to become top athletes develop a different sense of rhythm"* (Interviewee 2).

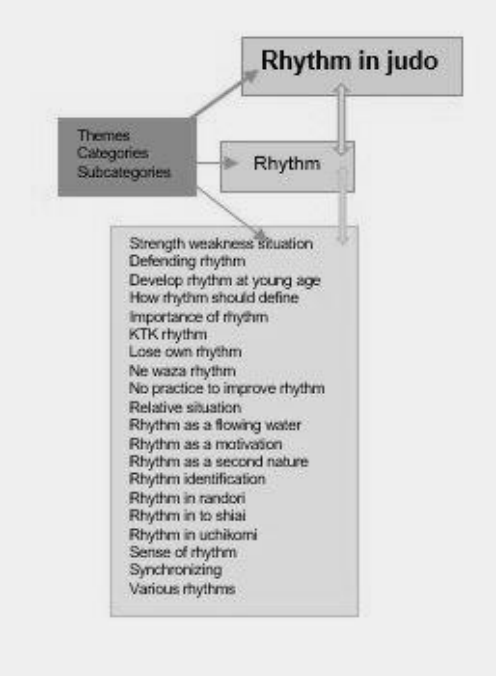
As Welsh national judo team coach, the researcher worked with a Welsh athlete in the cadet age group, who started training using his own rhythm and which was different to that of the rest of the team. This became apparent after video footage of his performance during the fight was analysed, as the practitioner's opponents could be seen trying to defend themselves at the wrong time. As a result, their opponent was unable to predict the time of attack even if they had guessed the technique Welsh player was trying to apply. This example falls in line with the following statement, *"There are two things. The first is the rhythm within your own body, hands and feet coordination related to your own body - feet, hands, body turn - that kind of rhythmical coordination of your own body. That's the first. The second is the relationship, 'relative situation, 'relative phase', the different rhythm between you and your opponent. The rhythm between you and your opponent is different - change the rhythm."* (Interviewee 5).

Interviewee 4 mentioned, *"for example, in general athletes who are skilled at waza techniques - who have effective and dynamic waza techniques, and those who are very good at nage-waza - they all have a good feel for rhythm"* that is, athletes who have the ability to effectively apply a technique have a good sense of rhythm. *"Most athletes with a good sense of rhythm like that, and I'm not sure if this just relates to Japan or not, are those started learning early in life"* (Interviewee 4).

All of the above statements point to the fact that athletes have different rhythms and, as a result, a coach needs to encourage his athletes to develop various forms of rhythm, *"when I teach, I first get the students to work on various rhythms via the same training programme"* (Interviewee 2), *"when doing judo considering and developing various ideas during regular practice sessions and then putting them into practice and then using things learned in daily practice sessions in competition is very important in order to improve"* (Interviewee 6), (see Figure 18).

Figure 18

Rhythm in Judo



5.3.3.1 Rhythm in judo

The definition of rhythm by the famous judo teacher Ota is, "Optimum rhythm and timing for proper, efficient, performance" (Ota, 2019). However, this study sees rhythm in judo as being much more than this, *"[A] sense of rhythm should not just be treated as an important aspect but thought of as second nature"* (Interviewee 4).

"With my own judo, I was very aware of the importance of rhythm and movement and it was foremost in my mind when I practiced judo" (Interviewee 6). The subcategory 'sense of rhythm' confirms how important rhythm is to a participant's experience.

Coaches all over the world are looking for fast track training programs (Iermakov et al., 2016), (especially national team coaches) to help players develop the ability to achieve good results. *"First, in order to train up athletes to win*

competitions, the athletes need to develop a different sense of rhythm to other athletes. They need to find their own sense of rhythm and teachers need to develop a training programme that encourages that" (Interviewee 2). 'Sense of rhythm' was revealed by two interviewees and produced 11 elements. This seems to be a sensitive point in an athlete's development, *"Every athlete has their own sense of rhythm"* (Interviewee 2). *"In competition, athletes that reach the top have a very different sense of rhythm different to their opponents"* (Interviewee 2). *"For example, in general athletes who are skilled at waza techniques - who have effective and dynamic waza techniques, and those who are very good at nage-waza - they all have a good feel for rhythm"* (Interviewee 4). *"Most athletes with a good sense of rhythm like that, and I'm not sure if this just relates to Japan or not, are those started learning early in life"* (Interviewee 4).

Although the subcategory 'Opponent Movement' was revealed by four interviewees producing 12 elements, the subcategory 'Sense of Rhythm' was revealed by two interviewees producing 11 elements. However, if we include the two interviewees who also refer to rhythm in the movement of the opponent, then the figure totals 16 elements. *"Depending on the opponent's movement, you should take rhythm into account when doing tai-sabaki"* (Interviewee 2*). "If you perform a waza without any prior movement, your opponent will counter. But if you perform a waza having built up a rhythm, your opponent won't be able to anticipate the technique (waza) you are going to use and therefore will find it difficult to counter"* (Interviewee 2). *"By breaking their rhythm, you cause your opponent to waver and it unbalances them"* (Interviewee 2). *"Even if this movement doesn't have a regular rhythm, there will still be a little cycle. This could be seen as a trait of the opponent's movement. So, I think that first, it is important to grasp that concept"* (Interviewee 3). *"You should have a good grasp of your opponent's usual movement, that is to say their rhythm, and anticipate their movement"* (Interviewee 3). It should be noted that it was not only here that rhythm was mentioned but, in most cases, by all interviewees at almost all the stages of the interview process.

In the book, "*Mizu no Kokoro*: A Mind like Water" the author (Cooper, 2014) mentions that the flowing water is a movement, in the Kodokan's *koshiki-no-kata*, one of the elements that inspires the techniques is water in its various forms (Pauley,

2009), the *kata* has 14 techniques to the front "*omote*" and 7 techniques to the rear "*ura*".

Omote (Front)

1.*Tai* (Ready Posture)

2.*Yume-no-uchi* (Dreaming)

3.*Ryokuhi* (Strength Dodging)

4.*Mizu-guruma* (Water Wheel)

5.*Mizu-nagare* (Water Flow)

6.*Hikiotoshi* (Draw Drop)

7.*Ko-daore* (Log Fall)

8.*Uchikudaki* (Smashing)

9.*Tani-otoshi* (Valley Drop)

10.*Kuruma-daore* (Wheel Throw)

11.*Shikoro-dori* (Grabbing the Neckplates)

12.*Shikoro-gaeshi* (Twisting the Neckplates)

13.*Yudachi* (Shower)

14.*Taki-otoshi* (Waterfall Drop)

Ura (back)

1.*Mi-kudaki* (Body Smashing)

2.*Kuruma-gaeshi* (Wheel Throw)

3.*Mizu-iri* (Water Plunge)

4.*Ryusetsu* (Willow Snow)

5.*Sakaotoshi* (Headlong Fall)

6.*Yukiore* (Snowbreak)

7.*Iwa-nami* (Wave on the Rocks)

Numbers 4, 5, 13 and 14 of the *omote* techniques involve water: *mizu-guruma* (water wheel), *mizu-nagare* (water flow), and *yudachi* (shower), *taki-otoshi* (waterfall drop), (Kodokan, 2019; Kotani, 1970; Kotani et al., 1968). The perfection of movement is based on softness as a flowing water, *"the technique of an accomplished practitioner is comparable to the unbroken movement of fast flowing water - one short rhythm",* (Interviewee 3*). "If there is not a good rhythm in the one continuous movement of kuzushi, tsukuri and kake, the waza will not be smooth",* (Interviewee 3*). "In doing this the movements become smoother and as this smoothness is connected with the speed of the waza",* (Interviewee 4).

If the motion is soft, as in the phrase, *ju yoku go o seisu.* (softness subdues hardness) (Callan et al., 2018), it also helps with synchronisation. With the evidence that has emerged so far there seems to be a solid basis as to how experts regard rhythm, "w*hen you apply less force you need to synchronise your movements with your opponents for them to be effective"* (Interviewee 4), *"rhythm within your own body, hands and feet coordination related to your own body - feet, hands, body turn - that kind of rhythmical coordination of your own body"* (Interviewee 5), *"practicing repeatedly with good rhythm is necessary for improving waza" (techniques),* (Interviewee 3).

5.3.3.2 Rhythm as a multi-tool

One topic of discussion about rhythm is at what age this ability should be developed. Most people think the 'the younger the better' to be logical and use rhythm in education at all stages. The University of Patras published research on "Psychomotor and Physical Education in Preschool Education", and in Section 4, Kinetic Development in Childhood, which refers to rhythm as a learning tool (Ρήγα, 2015), evidence emerges that most physical activities such as jumping, running, hopping, skipping, and throwing involve rhythm and that mastering those skills has developmental benefits for children, one of which is a sense of rhythm (Grigg & Cummings, 2018; Upitis, 1987) Interviewee 3 argued, *"This is just my opinion but, there isn't any practice for improving sense of rhythm. The purpose of training is to polish attack and defence waza (techniques)",* while Interviewee 4 mentioned "*That*

kind of ability is easy to develop at a young age, so practitioners who started when they were very young have an advanced sense of rhythm and movement", (Interviewee 4).

However, rhythm is commonly accepted as a multi-tool, even as a motivational tool, *"good rhythm feels good and can be motivating and makes it easier to do repeated practice"*, (Interviewee 3). For example, music in training motivates players where intensity and duration are concerned, (Karageorghis et al., 1999; Szabo et al., 1999). *"Repetition in practice is easy and so if your rhythm is good you can practice for longer"*, (Interviewee 3).

Rhythm was also singled out as being important by another interviewee, *"with my own judo, I was very aware the importance of rhythm and movement and it was foremost in my mind when I practiced judo"* (Interviewee 6), and Interviewee 4 referred to the composure needed for judo practitioners to maintain their rhythm, *"to put it another way, when you get nervous you tense up - get nervous, you'll lose your own rhythm".*

One of the principal exercises in judo is *kuzushi, tsukuri, kake,* three stages in one action. Two respondents described how they used rhythm during these exercises, *"kuzushi, tsukuri, kake and a connection… 1) kuzushi 2) tsukuri, 3) kake. 1,2,3, - that's the rhythm"*, (Interviewee 1), *"to give beginners a clear understanding of kuzushi, tsukuri, kake, we usually teach them by employing the rhythm - 1, 2, 3"*, (Interviewee 3). The book "Judo Formal Techniques: A Complete Guide to Kodokan Randori no Kata" mentioned "the one-two-three count rhythm is most easily observed in techniques" (Otaki & Draeger, 1983). "*Beginners then practice this repeatedly so that they can learn to perform the move without a break, by repeatedly practicing uchikomi and nage-komi etc, you can achieve a good tempo in kuzushi, tsukuri, kake and you therefore get a good rhythm",* (Interviewee 3). On the same subject another interviewee added, *"I think that in nage-waza, these three - kuzushi, tsukuri and kake - are comprised of rhythm"* (Interviewee 6), *"I think that keeping kuzushi, tsukuri and kake in mind helps with the smoothness and improves speed which in turn helps improve the waza"*, (Interviewee 4).

The last point, but one of equal importance in this section, is the use of rhythm as a defence. How to defend yourself from an attack is a common concern for

coaches. One solution is scenario training, but this costs time because of the range of techniques involved. The problem with this type of defence training is that the athlete learns specific moves for specific attacks, and the whole strategy can fail if the opponent alters his attacking rhythm or imposes his own rhythm during the fight. The same thing is often seen with the grip. Coaches usually teach how to break the opponent's grip and not how to manipulate it into a beneficial attack. In Japan, one of the reasons fundamental judo is so important is because teachers follow basic rules, which are a) body preparation to adapt technique, and b) basic principles in the early stage of beginner level judo, *suri-ashi* and *tai-sabaki.* Carl B. Becker (1982) states, "thus, the principle of judo, from the very beginning, is not one of aggression, but of flowing with things" (Becker, 1982; Dominy, 1958).

In the interviews, the above sentiments were reflected by the experts and can be seen as a result of their experience, *"Building up rhythm makes it difficult for your opponent to anticipate your move (waza). They don't notice - you are preventing them from noticing",* (Interviewee 1), *"When you defend yourself against your opponent's waza you should be able to time the counter well, too. It's important to pay attention to your own rhythm and timing during practice",* (Interviewee 3), *"When you attack - changeable pace",* (Interviewee 5), *"If you move well rhythmically and then perform a waza, it is becoming more difficult for your opponent to defend themselves",* (Interviewee 1).

5.3.3.3 Pre-competitions and competition phase

In Japan, music used to be banned during training in the *dojo* but, now, universities play music during the warmup to motivate players. In the researcher's personal communication with elite teachers in Japan, the teachers mentioned that during *uchikomi* and *randori,* the music rhythm is different than the players rhythm, this might be a problem by confusing practitioners and, as such, coaches should be mindful of all aspects.

Uchikomi is fundamental training in judo, and a practitioner does not need to be an expert to understand the difference between correct and incorrect *uchikomi*. However, players most commonly focus on the details of the technique (which is

correct) but lose the element of rhythm of *uchikomi*, *"a good rhythm in repeated practice of nage-komi and uchikomi is a sign of improvement of waza (technique)"* (Interviewee 3); *"You can't really get a rhythm up in randori, so for example you can combine more than one technique in uchikomi - like renraku-waza where you combine several techniques. You can build up a rhythm through repetitious uchikomi"* (Interviewee 1).

Randori ne-waza and *tachi waza* is also fundamental training and is mentioned by Interviewee 2 when talking about *ne-waza*: *"Those who have good rhythm in ne-waza - their body is extremely supple and they have long arms and long legs… they would be better off practicing ne-waza than tachi-waza as they would quickly become good competitive athletes",* while Interviewee 4 mentioned *tachi-waza*, *"in randori, if you can get a feel for the rhythm of your opponent's movements, you can employ a well-timed waza. This results in randori with a good rhythm, however, in randori (we) teachers will give students feedback when they perform a well-timed waza and when they don't".* Jigoro Kano wrote, "in *randori* we teach the pupil to act on the fundamental principles of Judo, no matter how physically inferior his opponent may seem to him, and even if by sheer strength he can easily overcome him; because if he acts contrary to principle his opponent will never be convinced of defeat, no matter what brute strength he may have used" (Kano, 2021).

All the above training elements transferred harmoniously to the *shiai*, *"It can be said that it is important that the rhythm that the judoka developed in randori can be transferred into competition, and the waza perfected during practice should be used in shiai"* (Interviewee 3), *"If that rhythm is broken, they will feel that something is off. You learn to have a feel for things. I think that that is very important in order to win"* (Interviewee 4), *"Then you have randori practice, which is close to competition level, so if you practice this repeatedly you will get a feeling for competition"* (Interviewee 6).

5.3.3.4 Identification of rhythm in judo

One of the challenges of this particular study was to define rhythm in judo, because it has not received enough attention in specialised literature. One question posed by Interviewee 3 was, *"The main thing is how rhythm should be defined".* Other interviewees responded with caution to the question: Please can you describe to me what is rhythm in judo for you? (Question 6), *"Olympic level, world class medal-winning athletes have their own rhythm"* (Interviewee 2), *"In randori, a well-timed waza occurs when you have a good understanding of your opponent's rhythm and that's why it is very important that you have a feel for your opponent's rhythm"* (Interviewee 3), *"I put this rhythm to use in order to improve my game and, as judo is a combat sport, I always had an awareness of the need to break my opponents' rhythm. I practiced keeping both those aspects in mind"* (Interviewee 6).

All stages of a judo practitioner's preparation are destined to be applied to competition. The same applies to the rhythm and taking into account its appearance in various studies and the result of this study, part of the definition of rhythm in judo could be defined as "the imposition of movement to create an effective attack".

5.3.4 Human movement

'Human movement' is the academic study of how human beings move around, perform and exercise, especially in sport. 'Biomechanics' is the science of human movement (Bartlett, 2014). Physical education has evolved in recent years from physical training and coaching to kinesiology, the study of movement (Knudson & Knudson, 2007). Biomechanics is the science which applies the laws of mechanics to biological movement (Nigg et al., 2000). One area of interest to biomechanists is the study of the body during sport or exercise situations (NFPT, 2010). All participants in this research know the importance of human movement not only from experience, but also because of their scientific background. They have a profound knowledge which they started to gain during the period they were athletes themselves, and which grew as they studied for a degree in sports science, and later coaching national teams and/or assuming a role as professor at various universities of sports science across Japan. The

fact that this theme brings together 30 of the 154 text elements shows that participants focus on human movement and biomechanics. *"Judo is about opponents, human opponents, so you need to have a good understanding of a human's movements. Humans move forwards, backwards, sideways, diagonally. Your opponent will move in those ways and their balance will also adjust itself. If you feel those movements in your own body it will empower you, and that is very important in judo"* (Interviewee 4).

From the performance point of view, body movement is also connected with balance (Kejonen et al., 2003), and as such, can be linked with training methods. *Tai-sabaki* emerges as an important element in Japanese training methodology. *"They were may have been a few times, when something unexpected threw me off-balance psychologically and suddenly prevented me from making the move I wanted, but basically I think that humans move in ways that they are used to or have experience with"* (Interviewee 6).

However, these elements are not solely restricted to human movement. *Tai-sabaki* is also connected to rhythm so that it can be employed to control actions of the opponent. *"Depending on the opponent's movement, you should take rhythm into account when doing tai-sabaki"* (Interviewee 1). *"Understanding your opponent's movements"* (Interviewee 4), is related to the understanding of the rules of biomechanics, specific actions, and a practitioner's personal *tokui-waza*, which in judo are based on correct movements.

The three categories, 'Humans', 'Body' and 'Opponent', revealed 'Human movement' to be an important theme. Isolating the word 'movement', produces the element shown in the diagrammatic model at the end of this chapter. Summarising the result of the analysis highlights the theme of human movement as being one of the four main research outcomes.

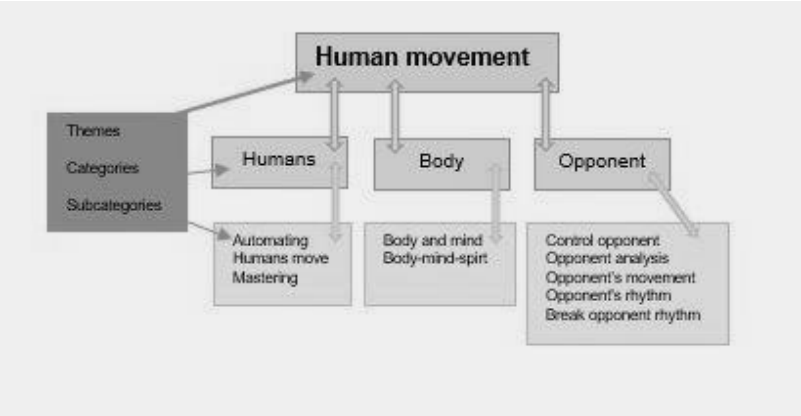
5.3.4.1 Mastering judo movements

Shin-gi-tai, translates as body, mind, spirit (Desormeaux, 2019). Inokuma & Sato (1986) in the book "Best Judo" introduce the idea of *shin-gi-tai*, which translates to “spirit, skill, and power.” “You have to train hard so that these three elements will be in harmony with each other when you face your opponent in the judo arena” (Inokuma & Satō, 1986). *“In Japan, Judo embraces something called shin-gi-tai - body, mind, spirit - literally mind, technique, body”* (Interviewee 2). A core concept in judo is that “softness overcomes hardness”, another way to say this is; *jū yoku gō o seisu*, meaning "softness subdues hardness" meaning that flexibility overcomes rigidity (*柔よく剛を制す*, 2022). Technique is paramount, and a smaller man can defeat a larger man*, “judo is a martial art, and these three words shin-gi-tai are associated with it”* (Interviewee 2). *“Another thing in judo is spirit - the spiritual strategy, spiritual battle between the two players”* (Interviewee 6). “True spirit of judo is nothing but the gentle and diligent free spirit. Judo rests on flexible action of mind and body. The word flexible however never means weakness but something more like adaptability and open mindedness. Gentleness always overcomes strength” (Mifune, 2004).

In order to master judo techniques, *“you need to practice and get your body to remember fast moves in order to unbalance (your opponent)”*, (Interviewee 5). Body and mind must remember the movements so that they can be performed automatically. *“This should be practiced repeatedly in a rhythmical way so the body remembers the moves. And as I said, the practitioner should keep kuzushi, tsukuri, kake in mind, and while knocking the opponent off balance, move into uchikomi or nage-komi and throw them well”*, (Interviewee 4), *“I think you need to have rhythm in order to throw your opponent. It’s important to begin a move by moving your body rhythmically”* (Interviewee 1), *“I think that the most important is mastering through hands-on practice”*, (Interviewee 6). Watanabe & Avakian (2011) pointed out, in regards to a judo expert’s level of mental development, “the arms are an extension of the mind” (Watanabe & Avakian, 2011), (see Figure 19).

Figure 19

Human Movement



The main object of Judo lies in this point, it seeks to augment human strength, morality and intellect by human means and efforts (Kano, 2005). It tends to train young people in the habits and condition conducive to the accomplishment of great undertakings (Watson, 2000). Judo is linked with an opponent, so automatically involves the human factor, *"Judo is about opponents, human opponents, so you need to have a good understanding of a human's movements. Humans move forwards, backwards, sideways, diagonally. Your opponent will move in those ways and their balance will also adjust itself. If you feel those movements in your own body it will empower you, and that is very important in judo"*, (Interviewee 4).

5.4 Interpretations

The results indicate that rhythm is important in all stages of an athlete's development, from a beginner's first steps through to elite player, and when rhythm is taught it must be taken seriously.

While this research seeks to understand how rhythm can improve the performance of an athlete, it also conclusively reveals that we are dealing with two characters: the coach and the athlete. The coach is involved at all stages of the athlete's development and, as is the practice in world of judo today, the athlete will

work with a minimum of two or more different coaches in his athletic career, from club level to destination “national team”.

‘Rhythm, patterns, and timing in martial arts through judo’ of “Judo Kata: Practice, Competition, Purpose” (Jones, 2016), L. Yiannakis (2019), writes about the internal rhythm mentioned, saying that her instructor used to tell her that technique takes on a life of its own (Yiannakis, 2019). That means athletes may need years to develop rhythm, timing, and patterns, and this is something that coaches must take into consideration in daily training.

5.4.1 Interpretation of the results

The results (as presented in Chapter 4) create a new method of teaching judo which is based on four main pillars: Pedagogy, Skills, Rhythm, and Movement. This is a completely unique and innovative tool in the hands of coaches, and stems from the accumulated knowledge of six of the most renowned Japanese teachers of the present day.

The first group of questions is: (Research question:1) *kata* stage, how do high-level teachers perceive the contribution of rhythm in the first steps of the practitioners? Jigoro Kano wrote, “I devised these judo *kata* mainly for the purpose of illustrating important points that I wished to explain to my students during breaks in *randori* practice. These are in essence the critical principles of judo ... by practicing *nage-no-kata*, my students were better able to grasp more quickly how these throwing techniques should be executed for maximum effect in *randori*” (Watson, 2000). This research contradicts the theory that *kata* is not a realistic training method, *nage-no-kata* training is the opportunity to study 15 different techniques for a specific purpose. Draeger (1983) mentioned the difference in the overall rhythms of throwing in *nage-no-kata*. This research is in complete agreement with the following statement about *nage-no-kata*, “Looking at it as just a set of stylised techniques is like looking at something from the outside without knowing what is going on inside” (Yiannakis, 2019).

5.4.2 Understanding the research questions

Through an interpretative analysis of the patterns and relationships in the data, the results were found to provide an insight into the research questions. As such, the results lend themselves well to the establishment of a new method of teaching for the judo community. As this study has increased the understanding of the subject, the results offer a creative idea in which the known or established methods can be combined with a new method of teaching to offer something novel, something that can be seen as a contribution to general scholarly understanding about the particular topic of using rhythm to teach judo.

As an experienced coach the researcher understands the importance of the words rhythm, tempo, harmony, timing. However, those words and much more were found to be connected in an unexpected way and in ways beyond the expectations of the researcher. The experiences gained through this research not only lived up to the expectations of the researcher but provided a new perspective on the teaching of judo. As this is an exploratory study, it addressed a number of questions concerning rhythm, pattern, synchronisation, and timing, all of which are basic skills that a judo practitioner needs to develop when training, and all of which have a strong connection with the question: “how do expert coaches train using rhythm from beginners to elite players?”. This overall question led to the three subsidiary research questions which underpin this study.

1) How do high-level teachers perceive the contribution of rhythm to the first steps of the practitioners?

2) How do high-level teachers evaluate the importance of rhythm in randori and its relationship in daily training?

3) How do top-level players use rhythm for offence/defence?

5.5 The Implications of this Study

5.5.1 Contribution of the research

It is important to understand the contribution of education to a child's first steps on the mat. The results show that the pedagogical approach is an important element for the practitioners and consequently the athletes. The pedagogical role of the coach has been discussed by many researchers (Kohler et al., 1997; Metzler, 1989; Occhino et al., 2014) and the training process provides practitioners with philosophical and fundamental principles which work together for the benefit of society. Jigoro Kano stated, “before and after practicing judo or engaging in a match, opponents bow to each other. Bowing is an expression of gratitude and respect. In effect, you are thanking your opponent for giving you the opportunity to improve your technique”, a statement in which the pedagogical character in teaching judo can clearly be seen.

Another element that emerges from the results is that the development of rhythm in the athlete must be such that it becomes second nature. The diagrammatic model analysis shows the contribution of rhythm in breakfalls, meaning that if the athlete develops rhythm to such an extent that it becomes second nature then they increase their level of safety both in training and in their daily life.

All of the above can be summarised in one word, “*shin-gi-tai*”, Inokuma & Satō (1986) wrote: “You have to train hard so that these three elements will be in harmony with each other when you face your opponent in the judo arena” (Inokuma & Satō, 1986), interviewee 2 mentioned: *“In Japan, judo embraces something called shin-gi-tai* - body, mind, spirit - literally mind, technique, body”. Judo stands for all of these, something highlighted in this research.

5.5.2 How the findings fit with existing knowledge

The findings of this research provide coaches with a way to turn rhythm into a tool in their daily training. The data suggests that the more they apply that method, the closer their athletes are able to get to an effective performance. This can be seen by the fact that what all six expert teachers said, sense of rhythm, break opponent's rhythm, *kuzushi-tsukuri-kake* three movement to one, and timing. This was reflected in the results of the Tokyo Olympic games, with the Japanese men's team winning five golds out of seven (with just two left for the rest of the world) and the women's team winning four golds out of seven (IJF, 2021). This makes the head coach Kosei Inoue the most successful coach in history, as measured by Olympic medals.

This study dug deep into the way Japanese teachers perceive the technical development of the athlete. In 1989, during a coaches' education program, a renowned coach from Tsukuba university, Mr. Ryozo Nakamura, mentioned: "if you fight with a gorilla you cannot win, he has 100 times more power than you, but that does not mean that the gorilla knows judo". (R. Nakamura, personal communication, November 28, 1989).

5.5.2.1 Consequences for theory or practise

The result of the research shows that in modern sports athletes need everything, strength and endurance can be developed, but technique is planted in the athlete's mind and body at a young age, slowly revealing itself over time. An interesting fact emergent from the current research is that, just as the ancient Greeks did in sports , Japanese teachers designed exercises aimed at (Nenova, 2016; Κομητούδη & Γιαννάκη, 2022) muscle growth combined with introduction to the technique for practitioners of a young age. The consequences of this method is that the technique will appear without second thought and exactly when needed. This method is known as *'hokyo'* (extra support training) and consists of a list of specific exercises that may differ from university to university or from club to club.

During the Tokai seminar in 2018 the researcher participated as a referee in a regional children's championship with 300 children as part of a programme entitled “How to Coach Juniors”. Hisayoshi Harasawa (Rio de Janeiro 2016 Olympic silver medallist) was invited to start the games and give a speech to the children. After the speech about his selection for the Olympic team, the children asked questions. An eight-year-old athlete asked him how he started judo and he answered as follows: “A friend of mine did judo and encouraged me to go training with him. For almost a year the teacher only allowed me to do *ukemi*. At the end of the school year, I told my friend that I was fed up and bored with *ukemi* and that I was going to stop judo classes. My friend suggested I talk with judo teacher before making my final decision, and I did so. The teacher told me not worry and that after the summer break they would teach me some techniques, but my second year in judo saw me again restricted to *ukemi*. The same thing happened later when learning the first techniques, and I thought I would not be able to do *randori.* I persisted, however, and continued to train in things that had nothing to do with *randori,* or so I thought at the time. Time passed and suddenly I started throwing my opponents without having any idea how I did it”. This is just one example of how Japanese methodology prepares the body to acquire the technique. The practical consequences of this study will therefore be more than positive, proposing to the coaches an applied and successful model which is now presented harmoniously and with rhythm.

5.5.2.2 The relationship of the results to previous research

Qualitative researchers seek 'theoretical generalisability' rather than exact replications (Yardley, 2008). Theoretical generalisability means that knowledge gained from researching a certain situation can be applied to other situations and "would prove useful in other contexts that had similarities" Yardley, (2008; p.238). This study can be considered a foray into a hitherto unexplored research area. As a result, more research is needed to see how transferrable the processes and phenomena seen here appear in other contexts. Nonetheless, the similarities between the current findings and those from earlier studies could indicate that knowledge is transferable.

The study's theoretical generalisability aligns with IPA's goals, which include understanding context-bound phenomena as they affect people or populations. The IPA promotes an inductive method to data collection, in which information is gained over time, (Tindall, 2009).

Despite the lack of academic research literature on the topic, rhythm in judo has been discussed by the Japanese for decades, and a number of books have been written by the Japanese experts referring to rhythm in both training and competition. Expert coaches often cite the metaphor that the bigger the base of the judo tree, the higher its top will go. They see one technique as being the trunk and many combinations of the technique as being the branches. As this research is one of the first of its kind in this field, most of the lietrature is sourced from books written by Japanese and the research draws on interviews with expert teachers. The results collate the scattered pieces (experiences) of the puzzle in the form of a specific teaching method.

5.5.3 The findings in relation to other studies

The findings are completely in line with other studies such as M., & Bountakis, G. (2017). In that study, a series of exercises regarding rhythm development in judo were proposed during the 4th European Science of Judo Research Symposium & 3rd Scientific and Professional Conference on Judo at the University of Zagreb. The journey from beginner to winner, was mentioned by Bountakis, G., Kanamaru, Y., & Burns, A., in the book: The Science of Judo (Bountakis et al., 2018). There are many other books and papers where judo teachers explore the concept of rhythm such as: The fundamental principles of judo (Tomiki, 1956), and Jones, L. (2016), Judo Kata: Practice, Competition, Purpose.

Polevaia-Secareanu, A. (2016), researching the training of judo athletes using rhythm and music, reveals that the current system of technical training has a number of unresolved issues that necessitate a comprehensive examination of the entire sport's training with the goal of correcting it and identifying the most effective means and methods. Furthermore, because the process of creation has received insufficient attention in specialised literature, extra attention must be devoted to the rhythmic

structure of the technical and tactical activities of judo athletes. In this regard, it is believed that a variety of non-traditional techniques and methods will aid in the development of logical motor structure of specific elements in judo fighting in accordance with the rules. The purpose of the Polevaia-Secareanu study was to determine the efficacy of rhythmic education in the learning and training of judo athletes and the findings revealed that an extended judo programme incorporating rhythmic education, satisfies the requirements for the structure and elaboration of the judo learning and training process whilst also resolving established problems. This suggested pedagogy seems to support the findings from this study, that pedagogy is an important element in developing rhythm in judo.

Similarly, also supporting the role of pedagogy is research entitled “the use of didactic laws in the teaching of the physical elements involved in judo techniques” conclude that a study of didactic rules, the sports practitioner's specific qualities, and his individual style is one of the most important components in completing the training process (Arziutov et al., 2016).

Lech, G., Sertić, H., Sterkowicz, S., Sterkowicz Przybycień, K., Jaworski, J., & Krawczyk, R. (2014), draw attention to the importance of skill during their study of the effects of different aspects of coordination on fighting methods and sport skill level in cadet judo contestants. The goal of the study was to establish whether there was a link between various features of coordination, bout time, and sport-related ability levels among cadet judo practitioners. It's worth noting that training for different age groups should be geared toward obtaining an individually tailored ideal degree of motor talents that adult athletes will eventually demonstrate (Lech et al., 2014).

There is research in rhythm in other sports or activities where the findings are not dissimilar. In his study “The scientific application of music in sport and exercise” Karageorghis, C. I. (2008) referred to the philosopher Plato’s belief about music and gymnastics. Plato believed that the teachers of the two arts of music and gymnastic are chiefly concerned for the improvement of the soul (Plato, The Republic). Karageorghis outlines the science behind the impact of music on sports and exercise. “The impact of music” in these circumstances are examined considering recent theoretical breakthroughs, and relevant literature is critically evaluated. The study and

application of music in sport and exercise environments presently has three complementary conceptual frameworks (Bishop et al., 2007; Terry & Karageorghis, 2006). Music can be used in a variety of ways for exercise, sports training, and competition. One of the most important advantages of music is that it improves the psychological state, which has implications for optimising the mental state of the athlete before competition and boosting enjoyment of the exercise. Music can enhance work output and make repeated tasks like cycling or running more energy efficient when used simultaneously (Karageorghis, 2008).

In "The Importance of Temporal Structure and Rhythm for the Optimum Performance of Motor Skills", MacPherson, A. C., Collins, D., & Obhi, S. S. (2009) suggested that temporally structured or rhythmical interventions could help people execute movement patterns in high-pressure situations. Interviewee 6 discussed the importance of applying rhythm in *shiai*, which is of course, the ultimate high-pressure situation in a judo environment.

5.5.4 The results in relation to existing theories

There are many theories about how a coach should teach. This research disagrees with the view that the athlete should first prepare his body by increasing their strength and endurance and then develop the technique or do both in parallel by investing 70% in strength and endurance and 30% in technique, both to the exclusion of rhythm. Nor does it agree with the Russian theories of the Concept of Permanent Combat or the Advantage Exclusion Strategy, presented in the book "Judo from a Russian Perspective" by Andrew Moshanov (2004).

The results of this research also disagree with the insertion of some form of wrestling in judo training (push-pull), but agrees with the integration of harmony, physical movement, as well as with other research which suggests *kuzushi-tsukuri-kake* as a basic condition for throwing (Sacripanti, 2010). As mentioned above the overwhelming results of the Japanese team in gold medals at the recent Tokyo Olympics (see Figure 20) in conjunction with the list of the top 10 countries presented in this paper (see Table 4) from 1956 to 2004, confirm the opinions presented in the interviews of various judo experts and leave no room for doubt.

Figure 20

Tokyo 2020 Judo Medals

	Nation	1.	2.	3.	5.	7.
1	Japan	9	1	1	1	-
2	Kosovo	2	-	-	-	1
3	France	1	3	3	-	-
4	Georgia	1	3	-	3	1
5	Czech Republic	1	-	-	-	-
6	Republic of Korea	-	1	2	2	2
7	Mongolia	-	1	2	-	1
8	Germany	-	1	1	2	1
9	Austria	-	1	1	-	-
10	Slovenia	-	1	-	1	1

Note. Adapted from International Judo Federation web page. https://www.ijf.org/competition/2035/standings

The results of the Japanese team from 1956 until today speak for themselves, showing the method for successful preparation of the athletes at all stages translates into good performance results. From now on, when designing their training programs, coaches should be taking rhythm training seriously, consider it to be second nature, and not just regarding it as another element.

5.5.5 Practical implications

There are a few possibilities for how this explicit focus can be manifested in training guidelines. The key is that coaches need to design and include certain goals in their teaching in order to resolve issues of rhythm. Because repetitive processes are often viewed as boring in the west, one of the most important aspects of teaching is

explicitly pointing out the benefits to athletes. For example, during a session a coach could note the cases where a problem arises, perhaps by discussing a different strategy an athlete could use to approach to a problem. This explicit labelling helps athletes devise a strategy that will solve the problem while increasing knowledge in other areas they are already familiar with.

The practical implications of this study mainly lend themselves to methods for rhythm training, how the coaches perceive the detail of the rhythm, at what point and in what way. These implications can only be described as positive as the experiment provides a new insight into the relationship between, pedagogical approach and realism in an athlete's performance.

The development of rhythm in judo has been transformed from theory into practice. In practice we can say that it is up to the coach to include exercises in his programme and to experiment with them, thereby improving the performance of the athletes through an applied method based on high-level teachers in this study.

5.5.6 Theoretical implications

Where theoretical implications are concerned, the findings either confirm a theory or disprove it. If the findings are consistent with a theory on which the research is based, it is confirmed (Oden, 2019). In the present study, the findings confirm the theory of the application of rhythm in judo as it is mentioned in the literature and by the participants in the research. Prain (2006), mentioned that there is a rising awareness among scientists that they must become familiar with techniques for representing their investigations and discoveries. Researchers require opportunities to write in ways that allow for engagement, clarification, and consolidation of developing understanding, and that writing may be used to shape and clarify knowledge. This research identifies different implications in regard to the theory and practice of future athletes and coaches in the development of rhythm based on literature and other recent reviews (Prain, 2006).

5.6 Limitations

There were a number of limitations to the research, some of which could not be predicted, such as COVID-19. A number of issues, though overcome, remained as limitations, and language was one of them. While the interviews were conducted with a qualified interpreter, the researcher would have greatly benefitted from the ability to speak directly in Japanese language. This would have resulted in the development of further questions in a more open discussion. Due to his background in judo, the researcher knows that Japanese teachers want to share knowledge and pass it on around the world, yet the respondents seemed relieved that there were specific questions as opposed to a more conversational interview.

A second limitation was the inability for the interviewer and interviewee to be physically present on the mat at the time of the interview as originally planned by the researcher. As a result of the COVID-19 restrictions all the interviews took place online. The advantages that would exist with both participants physically present rather than online would be the opportunity to give a physical demonstration to alongside many of the questions and answers. All Japanese experts have the ability not only to explain but to demonstrate by with examples. One way around this issue could be to have a list of exercises from recorded videos as an example of how can develop or improve rhythm, and this is something that could be seriously considered for future research.

The third limitation was that of travel restrictions not only between Europe and Japan but also to the rest of the world, with the result that the researcher could not travel for a long time and was forced to cancel scheduled meetings with experts in Europe as well. In addition, access to universities due to COVID-19 was impossible. On a more positive note, where it would normally take months for the researcher to be able to work all the interviews into the experts usually busy calendar, a reduced workload on their part meant that the interviews could be completed in less than a month.

Initially, the researcher designed the research plan whilst based in three *dojo*, across three countries; Sport Wales National Centre (UK), Tokai University (Japan) and Budo Center (Greece). Later, due to COVID-19, when completing the research

there was no access to a *dojo*, with the result that the study of specific exercises or even seeing judo in practice was not possible. On the other hand, a big improvement was observed in the study when writing up this work due to the continuous lockdown.

5.7 Outside the Scope of this Research

Thonney, (2012) recounted the story of an engineer who, having authored eight hundred publications, was asked how he was able to write so many articles: "I do a little typing, when I run through what I know and am up against something I don't, I simply type that such and such is 'beyond the scope of this article,' and I'm done", (Belcher, 2019). This study indicates that the reasons for claiming that "such and such, is beyond the scope" are more varied (Thonney, 2012). The researcher in the present work strongly believes that there are a variety of points that could be explored in the future around rhythm in judo, such as the rhythm made by the sound of feet on the *tatami* during *uchikomi*, or the use of music during *randori* sessions. The researcher during his stay in Japan in 2018 visited many *dojo* as part of his participation in the NPO solidarity seminar at Tokai University. One of them was a girls' high school with a very special motto "Pressure & Rhythm & Smile". The motto reflects the strategy of the *dojo*. The idea behind the strategy is:

Pressure → you should put a technical pressure on to your opponent

Rhythm → you should apply this technical pressure continuously

Smile → you should keep your smile even if training is very hard

The teacher of the team had designed a training program based on these three words and which was applied by all the athletes of the team in the competitions as a core strategy, *"ritsu"* (rhythm) in the middle is the key word (see Figure 21). This is another example of something that needs research but, like the two points above, it is beyond the scope of this study to explore this further.

Figure 21

Japanese High School Judo Club Motto

5.8 Recommendations for Further Research

The author's engagement in this research has been an exciting journey. However, further research is needed to further explore and fully understand rhythm in judo. Extending this study to athletes and coaches also seems highly relevant, especially where the findings of this study regarding the application of rhythm in daily training is concerned. Furthermore, replication of this study with female teachers would represent a valuable addition to judo literature.

More qualitative research focusing on the training experiences of elite athletes in the context of personal growth could add to the current findings. This would add to the existing knowledge base and help to build a body of research from which more general conclusions could be formed. This topic area could be advanced at a later time by larger-scale research that made use of diagrammatic analysis. Other aspects of training that high-level coaches or elite athletes may encounter and would have an impact on their personal development should be investigated in future qualitative studies. Present research implies that the benefits of rhythm in athlete development are a longer-term undertaking at every stage, realistically speaking. As a result, it appears that quantitative investigations should be complemented by qualitative research at the very least.

Once COVID-19 years has ended, further research should be undertaken where a series of exercises at all stages of the athlete's rhythm development is

recorded, from their first steps as a beginner to elite athlete. As this research shows rhythm development methodology, these exercises could be the next step for solving the rhythm problems of coaches and athletes.

5.9 Reflections of the Researcher

Judo research influenced researcher's understanding of the issue at hand, his expectations of what would be revealed, and the way interpreted the findings on numerous levels. Throughout the study process, In keeping with Columbus and Rice's (1991) argument that familiarity and experiential involvement with the subject area are vital to successful exploration in martial arts research, researcher viewed his own judo knowledge as a positive aspect. At the same time, had to admit that this position had the potential to limit the degree of openness with which the researcher approached the experiences of participants by making him more susceptible to accounts that matched his own personal experience. The research method also shifted his perspective on the subject; The researcher was only vaguely aware of the issue before the study but have been much more aware of it since then. Due to COVID-19, this research turned into a much longer project than intended. Despite the disappointments and obstacles, the longer period of time allowed more time for thought. For example, researcher was able to see how the knowledge he gained through it applied itself in my personal judo practice. Aside from his own judo experience, this research allowed him to obtain a better understanding of the value of personal development and the impact of other critical relationships in his life. This research has been a fascinating, enriching, and transformational experience for him. As Jigoro Kano stated, "If there is effort, there is always accomplishment". The researcher thought he knew the subject, in fact, was seeing blurry, just convincing himself that could see clearly, now what he can see clearly is "never late to learn more" and as the Greeks say *"διά βίου μάθησης"* (lifelong learning or studying).

5.10 Subsidiary Research Questions

The subsidiary research questions were:

1) *kata* stage (fundamentals); how do high-level teachers perceive the contribution of rhythm to the first steps of the practitioners?
2) *randori* stage (free training); how do high-level teachers evaluate the importance of rhythm in randori and its relationship in daily training?

3) *shiai* stage (contest); how do top-level players use rhythm for offence / defence?

The three strongest assertions made by this study are; a) Pedagogical approach as an introductory reference to judo, b) Rhythm of an athlete as second nature, c) Application of rhythm in judo as a means of performance.

Pedagogical approach as an introductory reference to judo, addresses the first subsidiary question, how do high-level teachers perceive the contribution of rhythm to the first steps of the practitioners? This was especially discussed by Interviewee 2, particularly as an educational method derived from the martial arts (Callan & Bradić, 2018). Judo training should follow an educational process. The effects of judo methods of training children at the initial stage of long-term training using specialized judo games can lead to the full development of physical features and shaping combat skills (Masenko, 2015).

Rhythm of an athlete as second nature, as discussed by Interviewee 4, addresses the question, how do high-level teachers evaluate the importance of rhythm in randori and its relationship in daily training? This refers to an instinctive sense of the rhythm within the combat situation by the athlete. The development of that instinct for rhythm is part of the pedagogical value of engaging in a combat situation. The role of rhythm within the situatedness of learning are more than just an element in athletes' performance (Hawhee, 2004).

Application of rhythm in judo as a means of performance (Interviewee 6), refers to the way that rhythm can be applied in *shiai* in order to gain success, and addresses the question, how do top-level players use rhythm for offence / defence? For example, the successful transition from standing to groundwork in a high-level

judo competition requires an understanding of the timing and distance between *tori* and *uke* and suggests that athletes need to be able to cope with different situations in the transition phase to be successful (Nagai et al., 2019).

So, what does this mean? The answer to this question is that in the past the application of rhythm was ignored in the field of judo and that this work evaluates and brings new findings to the content and the impact of its application. The outcome of this research is building on and contributing to knowledge we already have and is one more tool in the hands of coaches in their attempt to create high-performance athletes. Where future expectations are concerned, while the limitations of the study are recognised and presented in a more positive light, the findings pave way for future research.

5.11 Study Conclusion

This research provides first-hand experience of expert's teachers of a previously undiscovered phenomenon, namely the application of rhythm in judo and sheds light on how judo specialists interpret rhythm in relation to training, competition, and personal development. In order to answer the overall question; how do high-level teachers understand the concept of rhythm in judo? These findings imply that coaches play an essential role in teaching, mentoring, and guiding to students outside the context of training.

IPA is the appropriate methodology to use for a doctoral study, especially in a field such as judo. "It is a qualitative enquiry that focuses on how individuals make sense of their major life experiences" (Charlick et al., 2016). This study has explored the application of rhythm in judo, from the perspectives of expert teachers. It has provided important insights into how expert teachers understand the application of rhythm in judo and revealed that coaches play an important role for students, providing teaching, mentoring and guidance outside the training context (Bloom et al., 1998; Jones et al., 2009; Miller et al., 2002).

This study has theoretical and practical implications in judo. The researcher has been involved with judo for 43 years and his understanding of the subject area

affected his expectations of how, and in what way to make sense of the data. The researcher's experience can be regarded as a positive feature and in line with Columbus and Rice' assertion that, within martial arts research, the researcher's familiarity and experiential engagement with the subject area can be regarded as being important to successful investigation (Columbus & Rice, 1991). The researcher's experience is well suited to this study because he was able to understand the technical detail in the answers of the participants. The research process also altered the researcher's understanding of the topic area where, for example, the application of rhythm in training, or the pedagogical aspect as part of daily training is concerned.

"Softness controls Hardness" is a famous phrase taken from the ancient Chinese classics (Lao Tzu's "Three Strategies"), and its meaning is that flexibility overcomes rigidity (Low, 2009).

> "Let us assume I have an opponent who possesses power to the value of ten, whereas I must face this opponent with power only to the value of seven. When my opponent thrusts at me with all his energy, it follows that if I resist I will be overcome, even if I expend all my power. If, however, rather than resist my more powerful opponent, I adjust and adapt to his energy and pull back, he will fall forward under the strength of his own attack. His power of ten will become merely a power of three, and he will stumble and lose his balance. I will not be pulled off balance and can pull away, maintain my stance, and retain my original power of seven" (Kano, 2005).

Jigoro Kano, the founder of judo, expressed the notion of *ju yoku go o seisu*, or softness controls hardness,' in this way. Kano developed the concept of softness overcoming hardness into the principle of *seiryoko zenyō*, or the most efficient use of energy. For example, when discussing a hip throw, he adds that you should utilise your hips as a fulcrum, that if your hips are too high, at chest level, your opponent's weight above the fulcrum will be less than that below and throwing him will take a lot of strength, which is not an efficient use of energy (Callan, 2018b).

The phrase *ma-ai* is commonly translated as distance, in the literal sense, or interval (between things) in space, but also as an interval in time - the moment in music when the rhythm changes, and so on, as well as the verb *ai*, which indicates a meeting of two or more people or items. Thus, in addition to the abstract concept of

distance or interval, the word *ma-ai* represented a movement of growing closer or moving farther apart in respect to people or things (Tokitsu, 2012).

In conclusion, the research revealed four important points which form the basis of a new method of teaching judo. This is presented below as the PSRM Bountakis Method (see Figure 22):

Pedagogy: *"When a coach instructs students, they shouldn't teach 100% of the time, 70 - 80% should be teaching but the remaining 30% is down to the students themselves. No matter how good the athlete, if their heart is not in it, they will not excel. It is difficult to explain but even if they got lucky and won a gold medal, if their heart is not in it, they will not become a gold medal winner in life. So, teachers should not limit themselves to technical instruction and I think that they if they fail to provide instruction that embraces the human side as well, then the athlete will not succeed as they should*" (Interviewee 2).

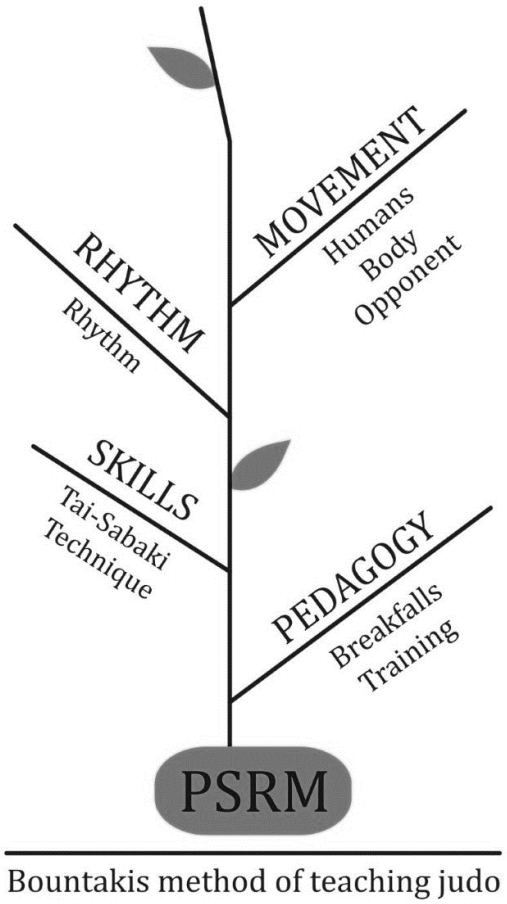
Skills*: "Waza practice in judo is - that's [in] general practice - is automating your own movement, practicing so your movements become second nature. Regular practice extends into competition. So, if you are able to employ those automated moves at in competition, you'll be at an advantage"* (Interviewee 5).

Rhythm: *"I think that uchikomi is very important. If your body gets a good feel for this move it leads to nagekomi. Rhythm is embedded in the body"* (Interviewee 4).

Movement: *"The were may have been a few times, when something unexpected threw me off-balance psychologically and suddenly prevented me from making the move I wanted, but basically I think that humans move in ways that they are used to or have experience with"* (Interviewee 6).

Figure 22

PSRM – Bountakis Method of Teaching Judo



5.11.1 Definition of PSRM – Bountakis Method of Teaching Judo

Firstly, design exercises in order for the body and mind to accept the teaching of the technique (pedagogy), then comes the development of technique and becomes one with the body (skills), these two together generate softness to the repetitive movement (rhythm), finally, the outcome of movement is that rhythm in the body becomes second nature (movement).

The above analysis highlights a new teaching methodology from the first steps of the practitioner to their completion as an elite athlete and is applicable not only to the sport of judo but to all sports since the formula is the same.

With this new method, complete athletes are created both in terms of skills and education, this is a contribution to society that clearly can be seen, after all, this was one of the reasons why sports were created in ancient Greece (Reid, 2007; Scanlon, 2002). Physical education and sport should not be only about skills, the ulterior purposes were the contribution to society (Laker, 2000), the purpose of physical education is to promote self-actualization, which in turn promotes ideal personal development and contributes to the society (Winnick & Porretta, 2016).

5.11.2 The Bountakis definition of rhythm in judo

All stages of a judo practitioner preparation are destined to be applied to the competition, the same applies to the rhythm, “I put this rhythm to use in order to improve my game and, as judo is a combat sport, I always had an awareness of the need to break my opponents’ rhythm. I practised keeping both those aspects in mind” (Interviewee 6). After consideration and the findings of this study, leads the researcher to define rhythm in judo as follows.

The Bountakis definition of rhythm in judo is:

The imposition of *tori’s* rhythm on the *uke’s* movement to create a skillful effective attack with the best use of softness in time and space. Therefore, learning judo requires a pedagogical approach to rhythm in judo.

CHAPTER VI: REFERENCES

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CHAPTER VII: APPENDICES

Appendix A: Further Reflections on the Interview Process

The interpretative nature of IPA requires researchers to critically reflect upon their impact on all stages of the research process. One stage of the research where reflection is crucial is the process of interviewing. In this section, the researcher will reflect on aspects of the interview process and analysis. One feature concerning the interviewees was that the interviews were mainly comprised of men. Throughout the interviews the researcher didn't feel that the fact that he was male and an expert in judo impacted on the interview process.

However, the researcher felt that the participants focused on the fact that researcher was male and that in many instances this facilitated rapport. It seemed to me that other factors like personality and the interviewees' expectations of the interview determined the quality of rapport. Some interviews seemed to flow better than others, and I would think that this was mainly due to the fact that participants felt more comfortable engaging with open-ended questions.

The whole interview process changed the researcher's way of thinking and put him in a position to re-think all stages of judo training from the beginning.

Also, due to the researcher's experience in judo, he was in tune with the interviewees and the research as a whole. Given the capabilities of the special coaches, and due to the nature of the questions, the interviews showed that the participants were comfortable considering the answers to the questions. At the end of the interview with Interviewee 2, when asked question 11, 'What was like for you to do this interview?', he answered, *"It has taken me back to my university teaching years and it was really interesting".* When asked the same question, the rest of participants answered: "*Very interesting. I haven't really thought about rhythm in this way. So, by answering these questions I have had a good chance to look again at this for myself."*, (Interviewee 4). *"Great fun"*, (Interviewee 6), *"Difficult! However, it was very interesting to consider rhythm in judo in this way. I have one thought about rhythm. Practicing repeatedly with good rhythm is necessary for improving waza (techniques). Good rhythm feels good and can be motivating and makes it easier to do repeated practice. Repetition in practice is easy and so if your rhythm is good you can practice for longer"*, (Interviewee 3).

It is possible that in the future, key elements of the investigation could be published without compromising confidentiality, publication or media, or websites, or newsletters, as long as participants had been made aware at the outset.

Appendix B: Judo Terminology

Japanese	**English**
Ashi-waza	Foot techniques
Ayumi-ashi	Ordinary pattern of walking
Budo	Martial ways
Dan	Black belt rank
Dojo	School or training hall for studying the way
Hando-no-kuzushi	Unbalancing by reaction
Hikite	Pulling hand — usually the hand gripping a sleeve
Hiza	Knee
Ippon	Victory in one move, one point
Jita-kyoei	Principle of mutual prosperity
Judo	Gentle or flexible way
Judogi	Judo practice uniform
Judoka	One who studies Judo
Kaeshi-waza	Counter techniques
Kake	Completion or execution of technique
Kansetsu-waza	Joint locking techniques
Kata	Forms
Kodansha	High ranking judoka — 5th dan and above
Kodokan	Judo institute in Tokyo where Judo was founded
Kumikata	Gripping methods
Kuzushi	Unbalancing the opponent
Ma-ai	Space or engagement distance
Mae	Forward, front
Mae-sabaki	Frontal escape
Mae-ukemi	Falling forward
Mate	Stop (wait)
Nage	Throw
Nagekomi	Repetitive throwing practice
Nage-waza	Throwing techniques
Ne-waza	Techniques on the ground
Obi	Judo belt
Randori	Free practice
Rei	Bow
Renraku-waza	Combination techniques
Seiryoku-zenyo	Principle of maximum efficiency
Seiza	Formal kneeling posture
Sen	Attack initiative
Sensei	Teacher, instructor
Shiai	Contest
Shihan	Title for a model teacher or “teacher who sets the standard” (i.e. Kano-*shihan*)
Tachi-waza	Standing techniques
Tai-sabaki	Body control, turning
Tatami	Mat
Te-waza	Hand techniques
Tokui-waza	Favorite or best technique
Tori	Person performing a technique
Tsugi-ashi	Walking by bringing one foot up to another
Tsukuri	Entry into a technique, positioning
Uchikomi	Repeated practice without completion
Uke	Person receiving the technique
Ukemi	Breakfall techniques
Ushiro-ukemi	Falling backward
Waza	Technique
Waza-ari	Near ippon or half point
Yakusoku-geiko	Pre-arranged free practice
Yoko-ukemi	Falling sideways
Mae-mawari-ukemi	Forward rolling breakfall

Appendix C: Interview Testing Schedule - Version 1

Questions:

1. At early age doing rhymical *ukemi* is this a part of athlete rhythm development? If we create categories for the *ukemi*, which of the following category would you choose for each *ukemi?* you can select more than one: Rhythm, Control, Timing, Dynamic, Harmony, Synchronization
2. As we know rhythm starts from the legs and transferred to the all body, *tai-sabaki,* is it useful in athlete's rhythm development and why? *Tai-sabaki* games help athletes understand rhythm at this stage? If yes, can you describe one or more?
3. *Kuzushi, tsukuri, kake*, is the three faces of *nage-komi*, what role rhythm plays on these drills?
4. Define rhythm in judo
5. From one to ten, how would you classify the ten stage of rhythm?
6. *Randori* rhythm (free training) transfer into competition. Which exercise helps the athlete to understand rhythm, you can mention more than one?
7. How to break opponent rhythm?
8. How can teachers develop this skill, can you describe more than one drill?

When is correct time/age in your opinion for athletes to learn how to impose rhythm on opponent, and when to break it?

Appendix D: Provisional Interview Schedule - Version 2

Interview Questions in Relation to Research Questions:

Research Question	**Interview Questions**
1.*Kata* stage, How high-level teachers perceive the contribution of rhythm in the first steps of the practitioners?	1.4 *Ukemi* is fundamentally the first thing practitioners learn in judo, how *ukemi* relate to rhythm? 1.5 Teachers mentioned *tai-sabaki* as a tool for athlete to use body rhythmically, please can you explain more? How *tai-sabaki* can teach the athlete to use his body rhythmically? 1.6 *kuzushi, tsukuri, kake,* is the three faces of throwing, based on your experience how rhythm connect?
2.*Randori* stage, How do high-level teachers evaluate the importance of rhythm in *randori* and its relationship in daily training?	7.2 What aspects of training have been an important part in rhythm development? 7.3 In what ways, can you help your students to develop rhythm in *randori*? 7.4 Please can you describe to me what is rhythm in judo for you?
3.*Shiai* stage, How top-level players can use rhythm for offence/defense?	3.1 Teachers mentioned the important of rhythm in randori in order players transfer rhythm in to *shiai* too, please explain more, why this is important? 3.2 Rhythm can be a tool during the training, but during the fight how to break the opponent's rhythm? 3.3 Please can you explain more, why it's important to break opponent rhythm?

Appendix E: Interview Schedule - Final Version

Final Interview Schedule
Today is… / of ……/2020 and I am going to interviewing Mr.……. together with Mss. ……. the interpreter
Do I have your agreement to record your voice? Mss. ……. do I have your agreement too?
As you know from the information sheet, you are free to stop interview at any stage without giving a reason. Also, if a question makes you feel uncomfortable do not need to answer it
I would like to start by asking you about your experience in judo
1. *Ukem*i is fundamentally the first thing practitioners learn in judo. Does *ukemi* relate to rhythm? If so, how does it relate?
2. Teachers mentioned *tai-sabaki* as a tool for athletes to use their body rhythmically, please can you explain more? How can *tai-sabaki* can teach the athlete to use his body rhythmically?
3. *Kuzushi*, *tsukuri*, *kake*, is the three phases of throwing, based on your experience how is rhythm connected to this?
4. What aspects of training have been an important part in rhythm development?
5. In what ways, can you help your students to develop rhythm in *rando*ri?
6. Please can you describe to me what is rhythm in judo for you?
7. Teachers mentioned the important of rhythm in *randori* in order for players to transfer rhythm into *shiai* too, please explain more, why this is important?
8. Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?
9. Please can you explain more about why it's important to break the opponent's rhythm?
10. We are coming to the end of the interview now. Is there anything else that you would like to add?
11. What was like for you to do this interview?
12. Did you find it *easy*/difficult?

Appendix F: Participant Invitation

Dear ……. sensei (teacher)

You are being invited to take part in a study exploring rhythm in judo.

I am a student at University of Hertfordshire UK, in PhD sport sciences.

I am hoping to do this research as my thesis.

To participate you would be required to attend in online interview about your experience in judo.

The interview will last for approximately one hour.

If you do decide to take part, you will be asked to sign a consent form.

Please note that my supervisor of studies or the external examiner may request access to the raw data for verification purposes. Also, I am intending to submit the completed study for publication with a renowned journal. Successful publication would require me to retain all data for a certain length of time. This could be around five years, depending on the journal.

All interviewees will receive a copy of the final study after completion of the project.

This study has been approved by the University Ethics Committee at University of Hertfordshire UK

If you have any questions, about this study please get in touch with me on +306977244211 or gbountakis@outlook.com.gr also you can contact my supervisor of studies, Dr Mike Callan on +447866836368 or m.callan2@herts.ac.uk

Thank you very much for your time

Kind regards,

George Bountakis

Email: gbountakis@outlook.com.gr

Phone +306977244211

Appendix G: Participant Information Sheet

You are being invited to take part in a study. Before you decide whether to do so, it is important that you understand the study that is being undertaken and what your involvement will include. Please take the time to read the following information carefully and discuss it with others if you wish. Do not hesitate to ask us anything that is not clear or for any further information you would like to help you make your decision. Please do take your time to decide whether or not you wish to take part. The University's regulations governing the conduct of studies involving human participants can be accessed via this link: http://sitem.herts.ac.uk/secreg/upr/RE01.htm

What is the purpose of this study?

<The study will focus on rhythm of the sport of judo, the aim is to give an answer and guideline at the all levels of athlete development.>

Do I have to take part?

It is completely up to you whether or not you decide to take part in this study. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. Agreeing to join the study does not mean that you have to complete it. You are free to withdraw at any stage without giving a reason. A decision to withdraw at any time, or a decision not to take part at all, will not affect any treatment/care that you may receive (should this be relevant).

Are there any age or other restrictions that may prevent me from participating?

<Under 18 years old>

How long will my part in the study take?

If you decide to take part in this study, you will be involved in it for *<30min to one hour>*

What will happen to me if I take part?

The first thing to happen will be *< to answer questions>*

What are the possible disadvantages, risks or side effects of taking part?

<nothing else except your time>

What are the possible benefits of taking part?

< you will receive an answer to the questions being investigated>

How will my taking part in this study be kept confidential?

< There will be no advertising for respondents, it is strictly confidential, personal data on the completed consent form will be stored (hard folder) in a locked cabinet in my office. After the project is completed the personal data on the consent form will be deleted. >

Audio-visual material

If you are intending to create audio-visual material, the participant must be informed of this. Items 12 and 13 should be completed to describe what will happen to this form of recording data, in terms of both storage and its transmission/display, and whether it might be required for use in further studies.

What will happen to the data collected within this study?

- I will create audio material; the interview will be audio recorded.
- The data collected will be stored electronically, in a password-protected environment, for <36> months, after which time it will be destroyed under secure conditions.
- The data collected will be stored in hard copy <by me> in a locked cupboard for <3> years, after which time it will be destroyed under secure conditions.
- I will use voice recorder only and the data will be stored in in hard copy <by me> in a password-protected environment, after the project is completed the recording file will be deleted.

Will the data be required for use in further studies?

- The data will not be used in any further studies.
- The data collected will be stored electronically, in a password-protected environment, for <36> months, after which time it will be destroyed under secure conditions.

- The data collected will be stored in hard copy <by me> in a locked cupboard for <36> months, after which time it will be destroyed under secure conditions.

Who has reviewed this study?

The University of Hertfordshire Health, Science, Engineering and Technology Ethics Committee with Delegated Authority

The UH protocol number is (LMS/PGR/UH/03713) this application has been approved by the Health, Science, Engineering & Technology ECDA.

Factors that might put others at risk

Please note that if, during the study, any medical conditions or non-medical circumstances such as unlawful activity become apparent that might or had put others at risk, the University may refer the matter to the appropriate authorities.

Who can I contact if I have any questions?

If you would like further information or would like to discuss any details personally, please get in touch with me, in writing, by phone or by email: <*phone: +306977244211 – email: gbountakis@outlook.com.gr* >

Although we hope it is not the case, if you have any complaints or concerns about any aspect of the way you have been approached or treated during the course of this study, please write to the University's Secretary and Registrar at the following address:

Secretary and Registrar: University of Hertfordshire College Lane Hatfield Herts AL10 9AB

Thank you very much for reading this information and giving consideration to taking part in this study.

Appendix H: Participant Consent Form

CONSENT FORM FOR STUDIES INVOLVING HUMAN PARTICIPANTS

……

I, the undersigned *[please give your name here, in BLOCK CAPITALS]*

……

Sufficient to enable the investigator to get in touch with you, *[please give contact details here such as a postal or email address]*

…..……

Hereby freely agree to take part in the study entitled *[Rhythm in Judo, teaching methods through rhythm to develop judoka]*

UH Protocol number is (LMS/PGR/UH/03713) this application has been approved by the Health, Science, Engineering & Technology ECDA.

1 I confirm that I have been given a Participant Information Sheet (a copy of which is attached to this form) giving particulars of the study, including its aim(s), methods and design, the names and contact details of key people and, as appropriate, the risks and potential benefits, how the information collected will be stored and for how long, and any plans for follow-up studies that might involve further approaches to participants. I have also been informed of how my personal information on this form will be stored and for how long. I have been given details of my involvement in the study. I have been told that in the event of any significant change to the aim(s) or design of the study I will be informed and asked to renew my consent to participate in it.

2 I have been assured that I may withdraw from the study at any time without disadvantage or having to give a reason.

3 In giving my consent to participate in this study, I understand that voice, video or photo-recording will take place and I have been informed of how/whether this recording will be transmitted/displayed.

4 I have been told how information relating to me (data obtained in the course of the study, and data provided by me about myself) will be handled: how it will be kept secure, who will have access to it, and how it will or may be used.

5 I understand that if there is any revelation of unlawful activity or any indication of non-medical circumstances that would or has put others at risk, the University may refer the matter to the appropriate authorities.

6 I have been told that I may at some time in the future be contacted again in connection with this or another study.

Signature of participant

……..……..…Date……

Signature of (principal) investigator

……..…..……Date……

Name of (principal) investigator *[GEORGE BOUNTAKIS]*

Appendix I: Participant Debrief

Dear Participant,

Thank you very much for taking part in this study. Your time and effort are greatly appreciated.

As mentioned before, will send you a copy of the completed study. Please let me know your address to post a copy.

If you have any questions, please contact me:

George Bountakis

Email: gbountakis@outlook.com.gr

Phone: +306977244211

Or my supervisor of studies:

Dr Mike Callan

Email: m.callan2@herts.ac.uk

Phone: +447866836368

Regards

George Bountakis

Appendix J: Excerpt of an interview transcript

Question 1 - *Ukemi* is fundamentally the first thing practitioners learning judo relay tourism and if so, how does it relate

Answer: (*Ukemi* and rhythm… is it related? Let me see.) Rhythm is necessary for the timing of the slapping of the hand on the *tatami* mat.

Question 2 - Coaches mentioned *tai-sabaki* as a tool for athletes to use her body rhythmically, please explain more, how can *tai-sabaki* can teach the athlete to use his body rhythmically?

Answer: That's a difficult one! *Tai-sabaki*… Depending on the opponent's movement, you should take rhythm into account when doing *tai-sabaki.*

Question 3 - *Kuzushi, tsukuri, kake*, is the three faces of throwing based on your experience how is the rhythm connected to this?

Answer: *Kuzushi, tsukuri, kake* and a connection… 1) *Kuzushi* 2) *Tsukuri,* 3) *Kake*. 1,2,3, - that's the rhythm. (GB: So by using 1,2,3 - this is a kind of rhythm?) Yes, that's right.

Question 4 - What aspect of training have been an important part in rhythm development

Answer: *Uchikomi* and *nagekomi*. Especially *nagekomi* is necessary

Question 5 - In what ways can you help your students to develop rhythm in *randori*

Answer: You can't really get a rhythm up in *randori*, so for example you can combine more than one technique in *uchikomi* - like *renraku-waza* where you combine several techniques. You can build up a rhythm through repetitious *uchikomi*

Question 6 - please can you describe to me what is rhythm in judo for you?

Answer: I think you need to have rhythm in order to throw your opponent. It's important to begin a move by moving your body rhythmically.

Question 7 - Coaches mentioned the important of rhythm in *randori* in order players to transmit rhythm into to *shiai* two, please explain more, why this is important?

Answer: Building up rhythm makes it difficult for your opponent to anticipate your move (*waza*). They don't notice - you are preventing them from noticing. If you don't move rhythmically, your opponent can defend themselves against your move. If you move well rhythmically and then perform a *waza*, it is becoming more difficult for your opponent to defend themselves. Also your opponent could lose their ability to focus on your intended *waza*. Let me clarify, if you perform a *waza* without any prior movement, your opponent will counter. But if you perform a *waza* having built up a rhythm, your opponent won't be able to anticipate the technique (*waza*) you are going to use and therefore will find it difficult to counter.

Question 8 - Rhythm can be a tool during the training but during the fight how can the player break the opponent rhythm?

Answer: (How to break the opponent's rhythm…? That's a difficult one!) Perform a *waza* that your opponent has not anticipated.

Question 9 - Please can you explain more about why it's important to break the opponent's rhythm?

Answer: Probably a psychological reason. By breaking their rhythm, you cause your opponent to waiver and it unbalances them

Question 10 - We are coming to the end of this interview now is there anything else you would you like to add?

Answer: It's very difficult to define rhythm (in judo). In music it is said people have a 'sense' of rhythm and in sports, too, it is said some athletes have this sense while others do not. Is that the rhythm you mean?

Question 11 - What was like for you to do this interview?

Answer: I'm not entirely clear as to the purpose of the interview.

Question 12 - Did you find it easy or difficult?

Answer: Difficult!

Appendix K: Interpreter background

Employment History

Television Versioning and Translation (TVT)

HEAD OF LOCALISATION

Television Versioning and Translation (TVT)

OPERATIONS MANAGER FOR BBC WORLD (JAPAN TRANSLATION UNIT)

TV Asahi (Japanese News Broadcaster), London Bureau

CAMERAMAN / PRODUCER

Researching news stories for correspondents / monitoring current affairs in EMEA

Television Versioning and Translation (TVT)

SUBTITLER / BROADCAST COORDINATOR

Nippon Television (NTV)

ASSISTANT RESEARCHER AND ASSISTANT TO CAMERAMAN

Japan Peace Boat, Tokyo, 68th & 70th Global Voyage

INTERNATIONAL COMMUNICATION COORDINATOR

Educational Qualifications

University of Bath - MA in Interpreting and Translation (Japanese <> English)

The University of Sheffield - MA in Advanced Japanese Studies

The University of Manchester - BA Hons French and Linguistics

JLPT Level 1

Appendix L: Final Interpreting Transcript

Final Interview Schedule
Today is May 2nd, 2020 and I am interviewing Mr…… together with Alex Fukuda the interpreter 2020 年 5 月 2 日です。増地 克之先生が参加しています。通訳者は福田アレックスです。
I would like to inform you that I will use voice recorder, do you agree? このインタビューを録音します。大丈夫でしょうか。 Yes.
As you know from the information sheet, you are free to stop interview at any stage without giving a reason. 説明書に書いてある通り、いつでもインタビューをやめてもいいです。理由を出さなくても結構です。(OK) Also, if a question makes you feel uncomfortable do not need to answer it もし、答えにくい質問があった場合、あえて答えなくても結構です。(OK)
I would like to start by asking you about your experience in judo, 初めに、（名前の柔道の経験についてお聞きします。
1. *Ukemi* is fundamentally the first thing practitioners learn in judo. Does *ukemi* relate to rhythm? If so, how does it relate? 柔道かが初めて柔道を勉強する時、*UKEMI* を勉強します。*UKEMI* はリズムと関係がありますか。もし、そうであれば、どういう関係ですか。
2. Coaches mentioned *tai-sabaki* as a tool for athletes to use their body rhythmically, please can you explain more? How can *tai-sabaki* can teach the athlete to use his body rhythmically? - 柔道の先生方により、柔道選手が体をリズミカルに動かすため、*TAI SABAKI* を使うのが普通です。この考えについて、もう少し説明していただけますか。 - というのは、どうやって *TAI SABAKI* を使って、リズミカルに体を動くようにすることができますか。
3. *Kuzushi*, *tsukuri*, *kake*, is the three phases of throwing, based on your experience how is rhythm connected to this? 投技(*nage-waza*)は *KUZUSHI*、*TSUKURI* と *KAKE* でできています。（名前）さんの経験から見れば、投技とリズムはどういう関係がありますか。
4. What aspects of training have been an important part in rhythm development? 柔道の稽古(*keiko* - practice)で、リズム感を高めるには、どのようなトレーニングが大切でしょうか。
5. In what ways, can you help your students to develop rhythm in *randori*? *RANDORI* で、柔道をまなんでいる人のリズム感をどうやって上達させれば良いでしょうか。
6. Please can you describe to me what is rhythm in judo for you? 増地 克之 先生にとって、柔道においてリズムをどのように捉（とら）えていますか。
7. Coaches mentioned the important of rhythm in *randori* in order for players to transfer rhythm into *shiai* too, please explain more, why this is important? 柔道の先生は、*RANDORI* で身につけたリズムを *SHIAI* でも取り入れることが大切だと言いましたが、それはなぜでしょうか。
8. Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm? （柔道の）稽古(*keiko* - training)でリズムが一つの道具になりますが、試合中どやって相手のリズムを崩す（くずす）ことができますか。
9. Please can you explain more about why it's important to break the opponent's rhythm? なぜ、相手のリズムを崩すことが大切でしょうか。
10. We are coming to the end of the interview now. Is there anything else that you would like to add? インタビューが終わる前に、追加のコメントがあれば、お願いします。
11. What was like for you to do this interview? このインタビューはどうでしたか。
12. Did you find it *easy*/difficult? インタビューは簡単でしたか、または難しかったでしょうか。

Appendix M: Ethics Approval

University of Hertfordshire UH

HEALTH SCIENCE ENGINEERING & TECHNOLOGY ECDA

ETHICS APPROVAL NOTIFICATION

TO Georgios Bountakis

CC Michael Callan

FROM Dr Simon Trainis, Health, Science, Engineering & Technology ECDA Chair.

DATE 15/05/2019

Protocol number: **LMS/PGR/UH/03713**

Title of study: Rhythm in Judo, teaching methods through rhythm to develop judoka

Your application for ethics approval has been accepted and approved by the ECDA for your School and includes work undertaken for this study by the named additional workers below:

This approval is valid:

From: 15/05/2019

To: 01/05/2021

Appendix N: Participant Transcript Summary

Dear X.....,

Thank you again for taking part as a volunteer in this study. I Much appreciate.

Here is a transcript summary of our interview.

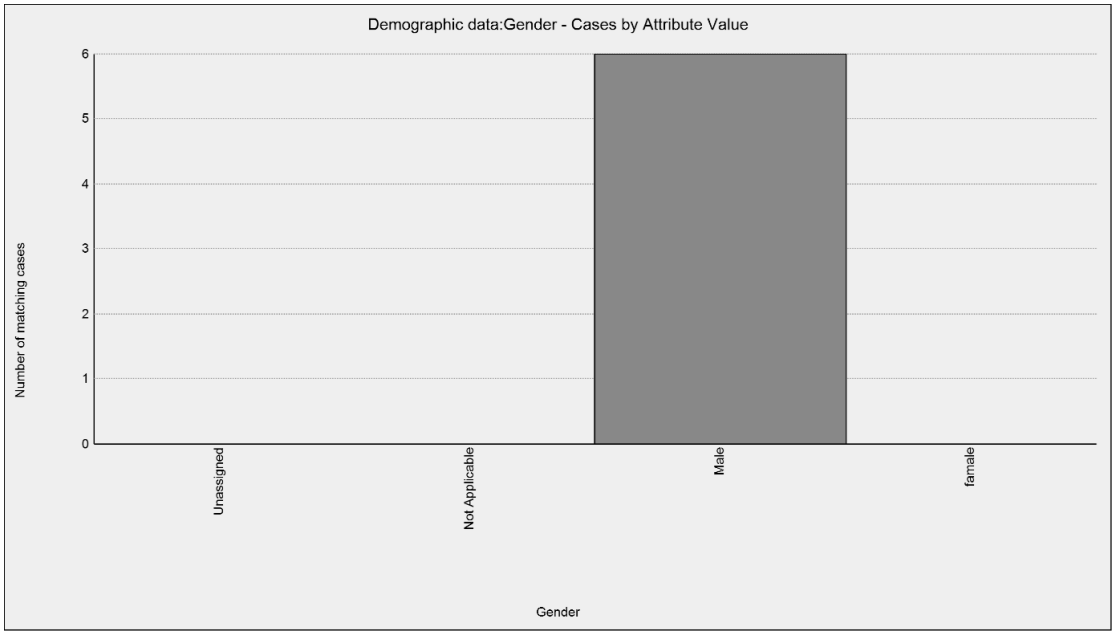
I would like to receive feedback from you regarding transcript, or if you want to add something, please get back to me within the next two weeks so that I can include your views.

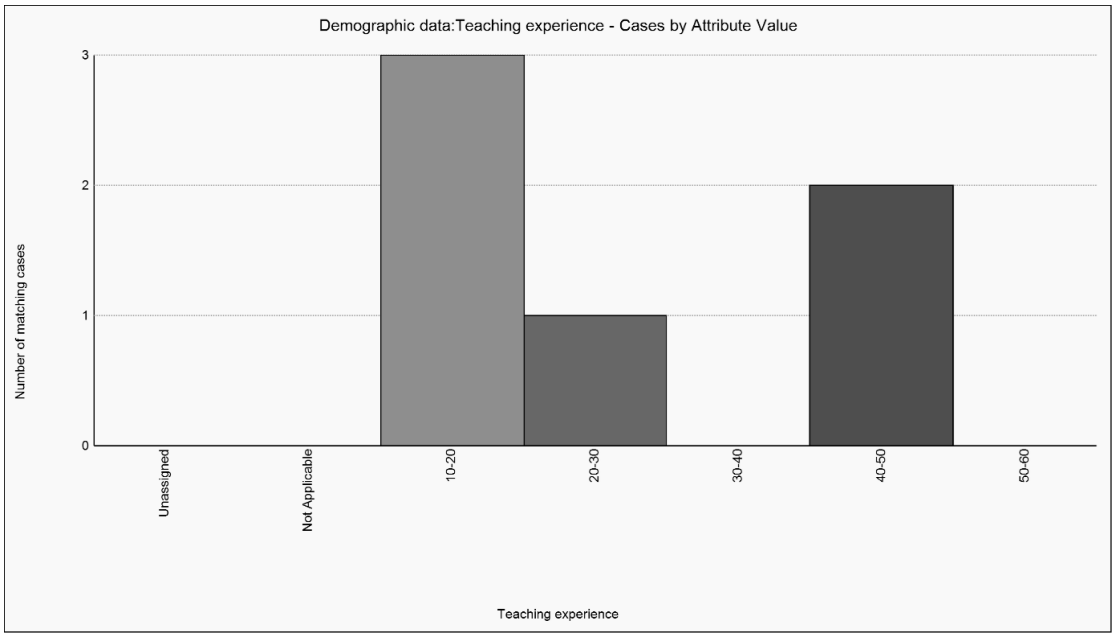
I would be grateful if you could send me a received confirmation email

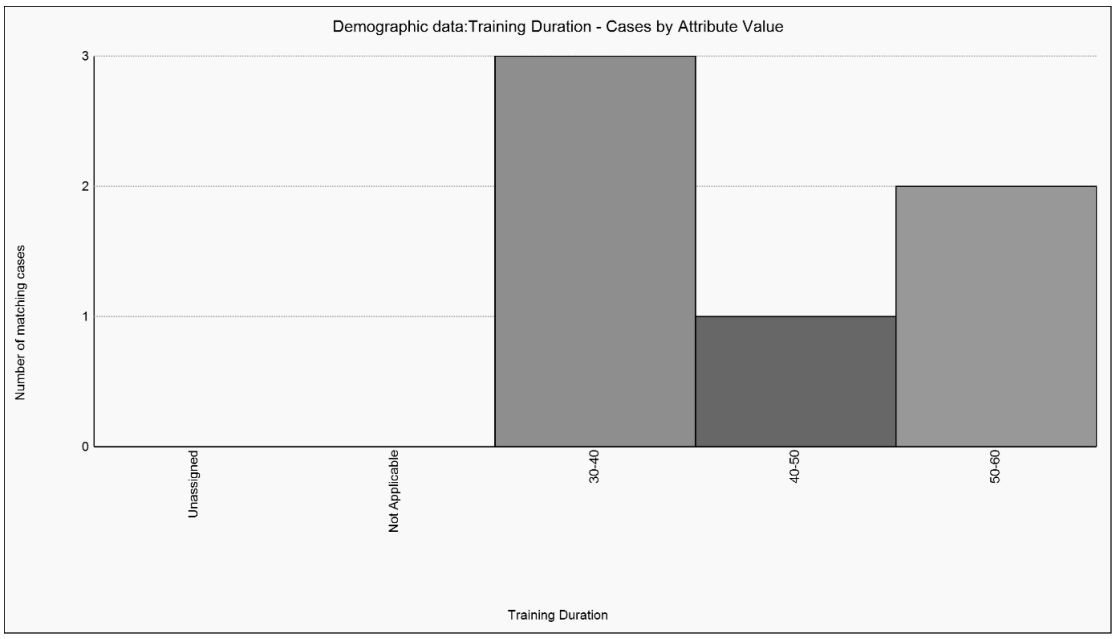
Best regards,

George

Appendix O: Demographic Data



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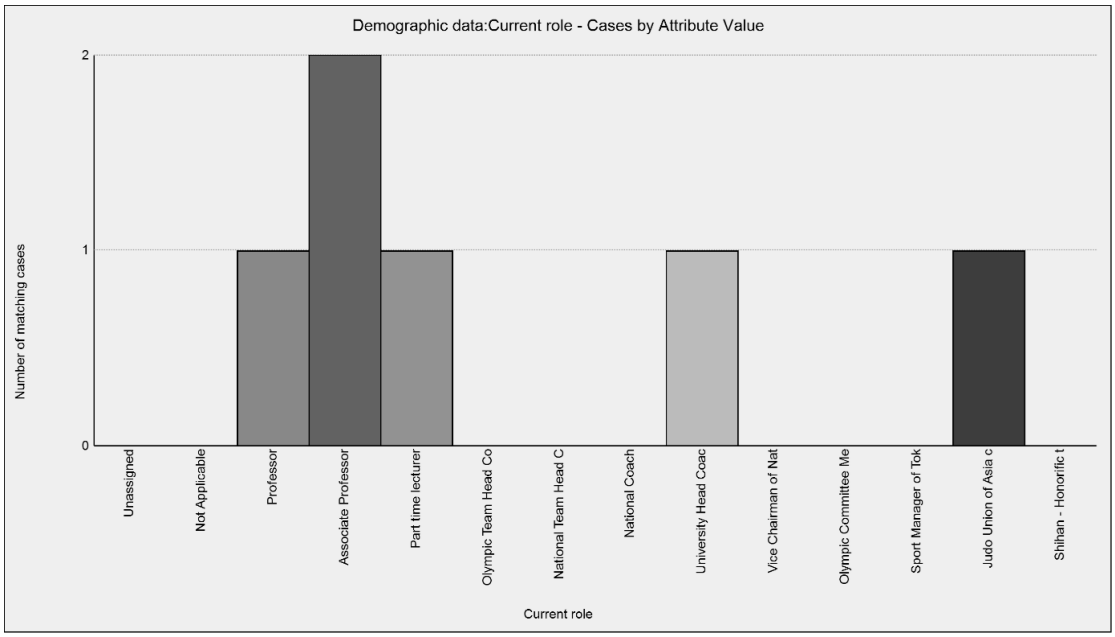
40-50
50-60
Training Duration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Part time lecturer
Olympic Team Head Co
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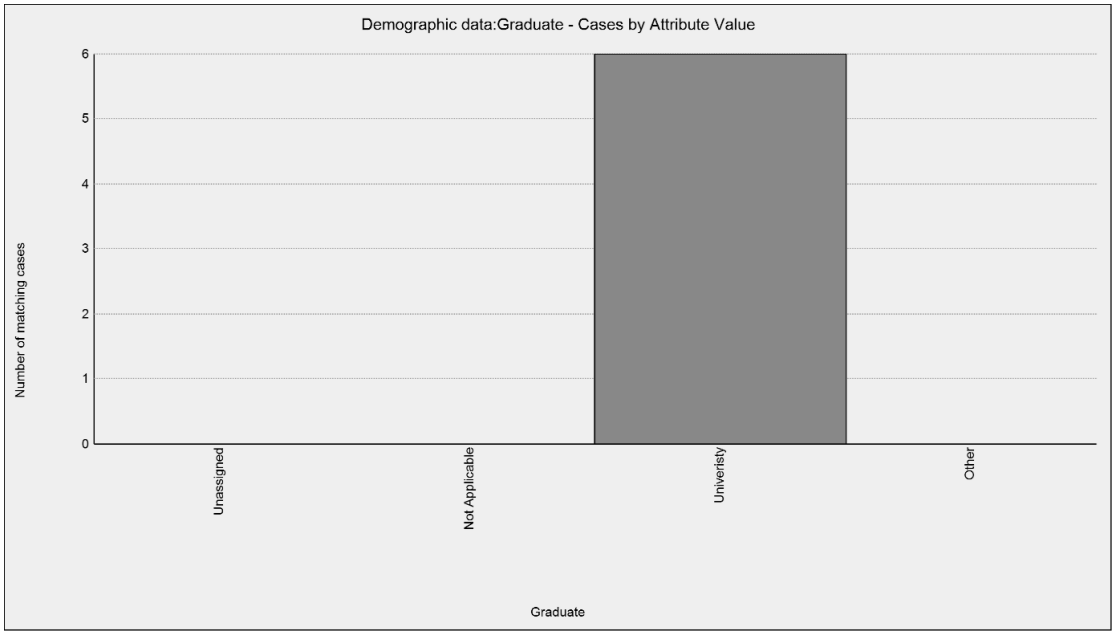
National Coach
University Head Coac
Vice Chairman of Nat
Olympic Committee Me
Sport Manager of Tok
Judo Union of Asia c
Shihan - Honorific t
Current role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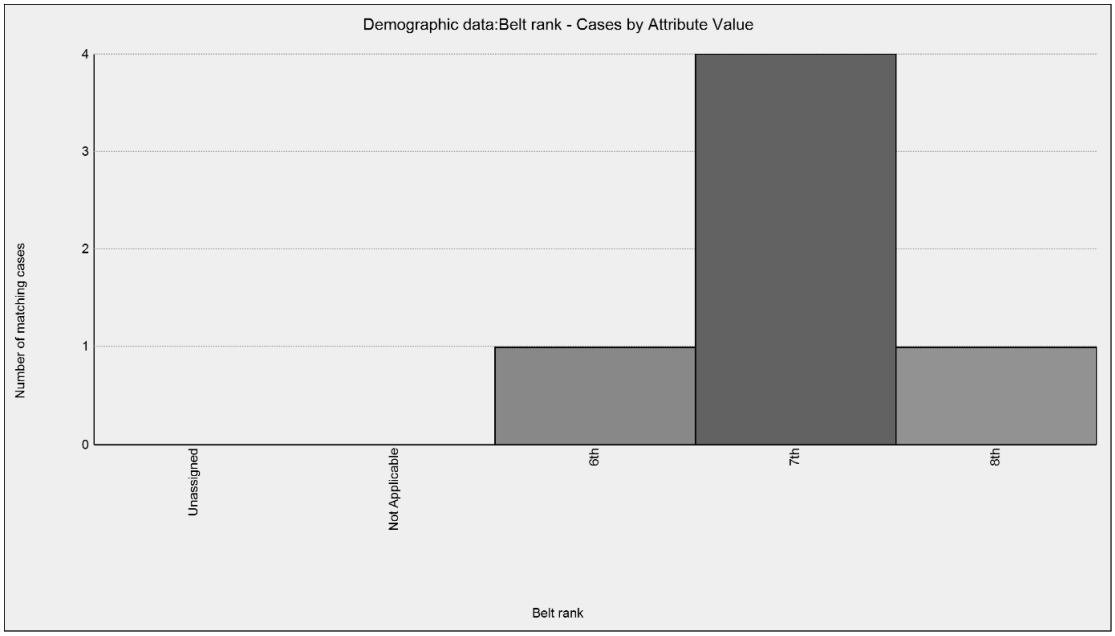
University
Other
Graduate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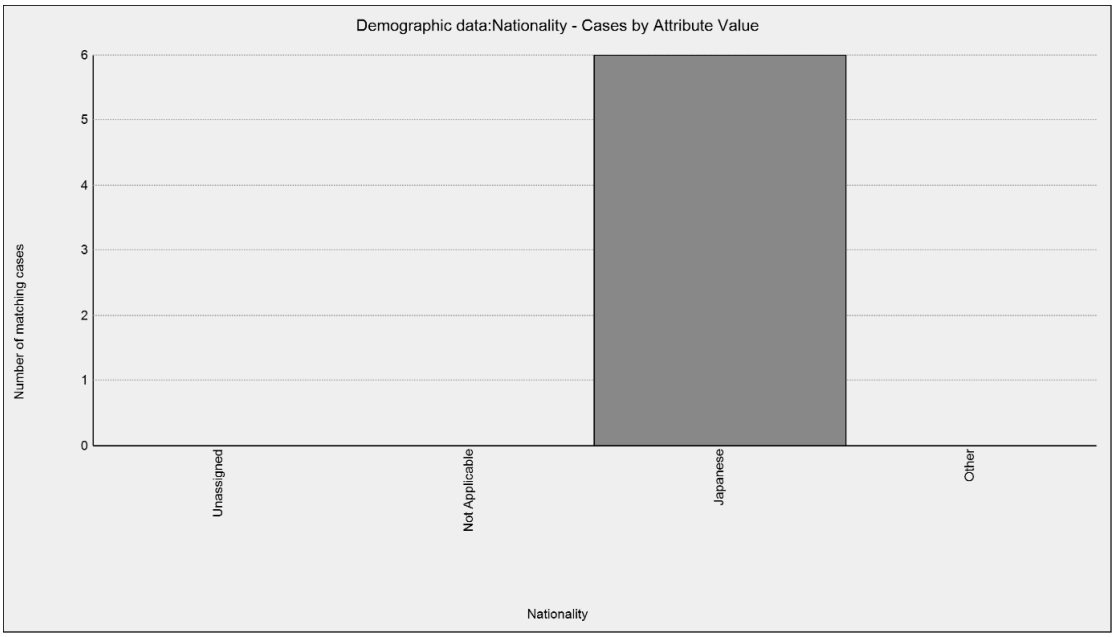
Belt rank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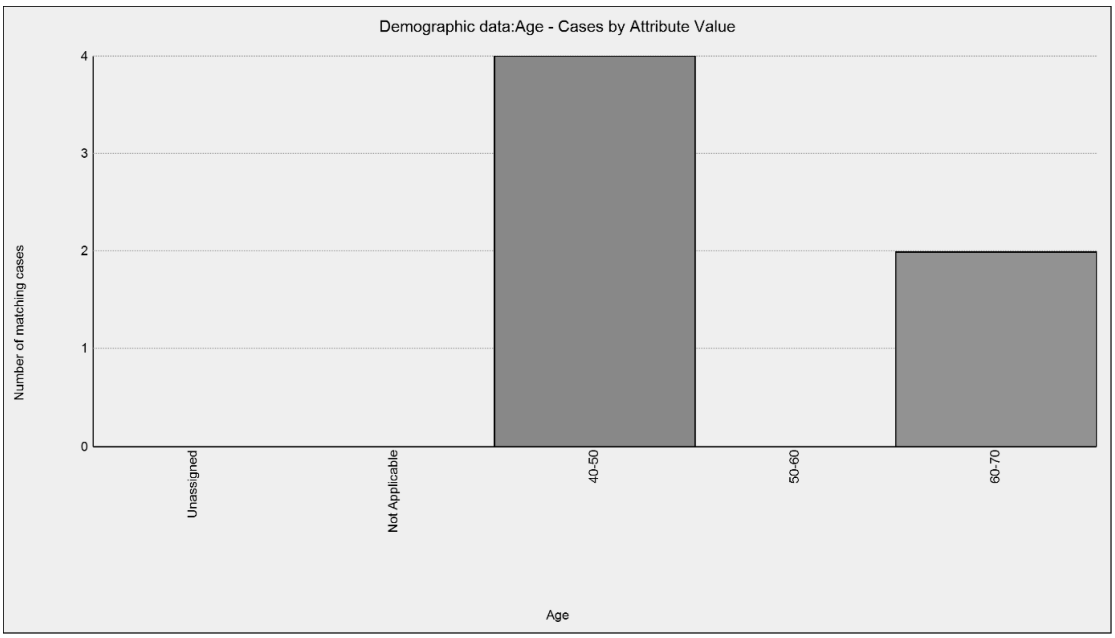
Nationality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Not Applicable
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50-60
60-70
Age

Appendix P: Data Analysis into Subcategories

Name	Files	Reference
automating	1	1
body and mind	3	6
body-mind-spirt	2	3
break opponent rhythm	2	6
control opponent	1	1
counter *uchikomi*	1	1
develop personal style	1	1
defending rhythm	3	5
different partners in randori	1	2
develop rhythm at young age	1	1
efficient *tai-sabaki*	2	4
Feints	1	1
highly important	1	1
how rhythm should define	1	1
humans move	2	2
image training	1	1
importance of rhythm	1	1
KTK isn't broken up	2	2
KTK rhythm 1,2,3	3	5
KTK three movement to one	3	8
legs technique	1	1
lose own rhythm	1	1
Mastering	1	1
ne-waza rhythm	1	1
no practice to improve sense of rhythm	1	2
opponent analysis	2	4
opponent's movement	4	12
opponent's rhythm	3	4
posture based on fundamental	2	2
relative situation	1	1
rhythm as a flowing water	2	4
rhythm as a motivation	1	2
rhythm as a second nature	1	1
rhythm identification	3	3
rhythm in *randori*	1	3
rhythm in to *shiai*	3	3
rhythm in *uchikomi*	2	3
sense of rhythm	2	11
smoothly *tai-sabaki*	1	1
strength weakness situation	1	1
Synchronizing	2	2
tai-sabaki and body	1	1
tai-sabaki and posture	1	1
tai-sabaki attack defend	2	2
techniques is circle	1	3
time development	1	3
turn up pressure	1	1
two kinds of *tai-sabaki*	1	1
ukemi connect to technique	2	4
ukemi doesn't relate to rhythm	1	1
ukemi is circle	1	2
ukemi teaching rhythm	4	6
ukemi timing	1	3
various rhythms	2	3
world of competition	2	7

Appendix Q: Word Frequency Query Results

Word	Length	Count	Weighted Percentage (%)
rhythm	6	81	4.65
opponent	8	51	2.93
waza	4	50	2.87
important	9	44	2.52
good	4	33	1.89
practice	8	32	1.84
judo	4	27	1.55
body	4	25	1.43
move	4	24	1.38
think	5	24	1.38
movements	9	20	1.15
order	5	18	1.03
movement	8	17	0.98
competition	11	16	0.92
sabaki	6	16	0.92
athletes	8	15	0.86
perform	7	15	0.86
sense	5	15	0.86
kake	4	14	0.80
ukemi	5	14	0.80
well	4	14	0.80
also	4	13	0.75
techniques	10	13	0.75
uchikomi	8	13	0.75
need	4	12	0.69
randori	7	12	0.69
feel	4	11	0.63
kuzushi	7	11	0.63
attack	6	10	0.57
technique	9	10	0.57
tsukuri	7	10	0.57
develop	7	9	0.52
different	9	9	0.52
example	7	9	0.52
moves	5	9	0.52
nagekomi	8	9	0.52
opponents	9	9	0.52
break	5	8	0.46
first	5	8	0.46
improve	7	8	0.46
level	5	8	0.46
repeatedly	10	8	0.46
time	4	8	0.46
mind	4	7	0.40
performing	10	7	0.40
really	6	7	0.40
just	4	6	0.34
rhythmically	12	6	0.34
teach	5	6	0.34
thing	5	6	0.34

Appendix R: Detailed Analysis of Categories

Themes	Categories	Subcategories
1.Humans movement	1.Humans – TE= 4 (3%)	1.Automating – TE= 1 (1%) NI= 1 (17%) 2.Humans move – TE= 2 (1%) NI= 2 (33%) 3.Mastering – TE= 1 (1%) NI= 1 (17%)
	2.Body – TE= 9 (6%)	4.Body and mind – TE= 6 (4%), NI= 3 (50%) 5.Body-mind-spirt – TE= 3 (2%) NI= 2 (33%)
	3.Opponent – TE= 17 (16%)	6.Control opponent – TE= 1 (1%) NI= 1 (17%) 7.Opponent analysis – TE= 4 (3%) NI= 2 (33%) 8.Opponent's movement – TE= 12 (8%0 NI= 4 (67%)
2.Rhythm in judo	4.Rhythm – TE= 64 (44%)	9.Opponent's rhythm – TE= 4 (3%) NI= 3 (50%) 10.Break opponent rhythm – TE= 6 (4%) NI= 2 (33%) 11.Strength weakness situation – TE= 1 (1%) NI= 1 (17%) 12.Defending rhythm – TE= 5 (3%) NI= 3 (50%) 13.Develop rhythm at young age – TE= 1 (1%) NI= 1 (17%) 14.How rhythm should define – TE= 1 (1%) NI= 1 (17%) 15.Importance of rhythm – TE= 1 (1%) NI= 1 (17%) 16.KTK rhythm 1,2,3 – TE= 5 (3%) NI= 3 (50%) 17.Lose own rhythm – TE= 1 (1%) NI= 1 (17%) 18.*Ne-waza* rhythm – TE= 1 (1%) NI= 1 (17%) 19.No practice to improve rhythm – TE= 2 (1%) NI= 1 (17%) 20.Relative situation – TE= 1 (1%) NI= 1 (17%) 21.Rhythm as a flowing water – TE= 4 (3%) NI= 2 (33%) 22.Rhythm as a motivation – TE= 2 (1%) NI= 1 (17%) 23.Rhythm as a second nature – TE= 1 (1%) NI= 1 (17%) 24.Rhythm identification – TE= 3 (2%) NI= 3 (50%) 25.Rhythm in *randori* – TE= 3 (2%) NI= 1 (17%) 26.Rhythm in to *shiai* – TE= 3 (2%) NI= 3 (50%) 27.Rhythm in *uchikom*i – TE= 3 (2%) NI= 2 (33%) 28.Sense of rhythm – TE= 11 (7%) NI= 2 (33%) 29.Synchronizing – TE= 2 (1%) NI= 2 (33%) 30.Various rhythms – TE= 3 (2%) NI= 2 (33%)
3.Technical skills	5.*Tai-sabaki* – TE= 10 (8%)	31.Efficient *tai-sabaki* – TE= 4 (3%) NI= 2 (33%) 32.Smoothly *tai-sabaki* – TE= 1 (1%) NI= 1 (17%) 33.*Tai-sabaki* and body – TE= 1 (1%) NI= 1 (17%) 34.*Tai-sabaki* and posture – TE= 1 (1%) NI= 1 (17%) 35.*Tai-sabaki* attack defend – TE= 2 (1%) NI= 2 (33%) 36.Two kinds of *tai-sabaki* – TE= 1 (1%) NI= 1 (17%)
	6.Technique – TE= 9 (6%)	37.Legs technique – TE= 1 (1%) NI= 1 (17%) 38.Posture based on fundamental – TE= 2 (1%) NI= 2 (33%) 39.Techniques is circle – TE= 3 (2%) NI= 1 (17%) 40.Time development – TE= 3 (2%) NI= 1 (17%)
4.Pedagogical approach	7. Breakfalls – TE= 16 (11%)	41.*Ukemi* connect to technique – TE= 4 (3%) NI= 2 (33%) 42.*Ukemi* doesn't relate to rhythm – TE= 1 (1%) NI= 1 (17%) 43.*Ukemi* is circle – TE= 2 (1%) NI= 1 (17%) 44.*Ukemi* teaching rhythm – TE= 6 (4%) NI= 4 (67%) 45.*Ukemi* timing – TE= 3 (2%) NI= 1 (17%)
	8.Training – TE= 25 (18%)	46.Counter *uchikomi* – TE= 1 (1%) NI= 1 (17%) 47.Develop personal style – TE= 1 (1%) NI= 1 (17%) 48.Different partners in *randori* – TE= 2 (1%) NI= 1 (17%) 49.Feints – TE= 1 (1%) NI= 1 (17%) 50.Highly important – TE= 1 (1%) NI= 1 (17%) 51.Image training – TE= 1 (1%) NI= 1 (17%) 52.KTK isn't broken up – TE= 2 (1%) NI= 2 (33%) 53.KTK three movement to one – TE= 8 (5%) NI= 3 (50%) 54.Turn up pressure – TE= 1 (1%) NI= 1 (17%) 55.World of competition – TE= 7 (5%) NI= 2 (33%)

Appendix S: Participant Quotes Summary

Dear X.....,

Thank you again for taking part in this study. I Much appreciate.

Here is a summary of your interview quotes.

I would like to receive feedback from you regarding quotes, or if you want to add something, please get back to me within the next two weeks so that I can include your views.

I would be grateful if you could send me a received confirmation email

Thanks again for your time and effort to spread judo knowledge

Arigato!

Best regards,

George

Appendix T: Interview Quotes

Interviewee 1

"You need to have rhythm in order to throw your opponent. It's important to begin a move by moving your body rhythmically."

"If you perform a waza without any prior movement, your opponent will counter. But if you perform a waza having built up a rhythm, your opponent won't be able to anticipate the technique you are going to use and therefore will find it difficult to counter."

Interviewee 2

"While it's easy to say these three words - kuzushi, tsukuri, kake - perfecting them takes a great deal of practice and time."

"To get a student to develop into a good athlete quickly in a short time, the teacher should look out for good rhythm in ne-waza or tachi-waza and focus on the techniques which are best rhythmically."

"If you develop the same sense of rhythm as your opponents, you won't become a top-level athlete, It's very important to train yourself in a different way"

"Competition takes place for a fixed length of time, rather than watch and think about your opponent's rhythm, it's very important that athletes envelop their opponent in their own sense of rhythm."

"Over-analyse, your opponent will seem powerful which will have a detrimental effect on your mental strength, while it is important to study them to a certain extent, too much analysis will put you at a psychological disadvantage."

"Rather than break your opponent's rhythm, it's more important to pull your opponent into yours."

"When a coach instructs students, they shouldn't teach 100% of the time, 70 - 80% should be teaching but the remaining 30% is down to the students themselves."

"Even if they got lucky and won a gold medal, if their heart is not in it, they won't become a gold medal winner in life."

"Teachers should not limit themselves to technical instruction, if they fail to provide instruction that embraces the human side as well, then the athlete won't succeed as they should."

Interviewee 3

"The technique of an accomplished practitioner is comparable to the unbroken movement of fast flowing water - one short rhythm."

"When you defend yourself against your opponent's waza you should be able to time the counter well, too. It's important to pay attention to your own rhythm and timing during practice."

"A well-timed waza occurs when you have a good understanding of your opponent's rhythm."

"You must not let your opponent anticipate your own rhythm, which you do by avoiding building up a regular rhythm in your attack which you do by moving slowly then quickly to hide your intention of attack."

"You should have a good grasp of your opponent's usual movement, that is to say their rhythm, and anticipate their movement. If you do then you will be able to attack and defend with good timing"

"Good rhythm feels good and can be motivating and makes it easier to do repeated practice. Repetition in practice is easy and so if your rhythm is good you can practice for longer."

Interviewee 4

"Ukemi is associated with the same repetitive movements so rhythm is very important when it comes to teaching your body to familiarize yourself with those movements."

"Judo is about opponents, human opponents, so you need to have a good understanding of a human's movements."

"The timing becomes exceedingly important in ashi-barai waza where power isn't so effective."

"When you apply less force, you need to synchronise your movements with your opponents for them to be effective."

"Athletes who are skilled at waza techniques - who have effective and dynamic waza techniques, and those who are very good at nage-waza - they all have a good feel for rhythm."

"Sense of rhythm should not just be treated as an important aspect but thought of as second nature."

"The rhythm learnt in practice is necessary to give you an edge in competition. To put it another way, when you get nervous you tense up - get nervous, you'll lose your own rhythm."

Interviewee 5

"In judo it is important you aim to hold your posture in a way so as not to be unbalanced by your opponent."

"Waza practice in judo is - that's general practice - is your automating own movement, practicing so your movements become second nature."

"The first is to anticipate your opponent's attack move - predict the waza. The second is defending yourself against and controlling your opponent's move, grapple."

Interviewee 6

"Tai-sabaki is important in order for defending yourself against your opponent's waza effectively, and important before performing a waza when throwing your opponent off balance."

"When you perform the waza, it's not just about performing when your opponent shows weakness, but in competition for example, even when your opponent is showing strength, there is a point where it is good to perform waza."

"Getting your practice partner to put up more of a fight or move a bit more or getting a third person to join and increase the pressure on you will also help improve waza."

"With my own judo, I was very aware the importance of rhythm and movement and it was foremost in my mind when I practiced judo. I put this rhythm to use in

order to improve my game and, as judo is a combat sport, I always had an awareness of the need to break my opponents' rhythm. I practiced keeping both those aspects in mind."

"In order to perform well or in order to disadvantage my opponent, in order prevent them from performing well, I kept rhythm in mind and used it in competition to do the best I could."

"They were may have been a few times, when something unexpected threw me off-balance psychologically and suddenly prevented me from making the move I wanted, but basically I think that humans move in ways that they are used to or have experience with."

"Another thing in judo is spirit - the spiritual strategy, spiritual battle between the two players. Breaking the spirit, you can undermine your opponent's judo game - their rhythm and movements".

"At competition level, it enables you to give your best performance or, depending on how you disrupt your opponent's performance, enables you to perform in a way that is beneficial. This is not just limited to judo or sports but is also found at work and other aspects of life."

Appendix U: Interview transcripts

Interviewee - 1Mas

Question1 - Ukemi is fundamentally the first thing practitioners learning judo relay tourism and if so, how does it relate

Answer: (Ukemi and rhythm… is it related? Let me see.) Rhythm is necessary for the timing of the slapping of the hand on the tatami mat.

Question2 - Coaches mentioned tai-sabaki as a tool for athletes to use her body rhythmically, please explain more, how can tai-sabaki can teach the athlete to use his body rhythmically?

Answer: That's a difficult one! Tai-sabaki… Depending on the opponent's movement, you should take rhythm into account when doing tai-sabaki**.**

Question3 - kuzushi, tsukuri, kake, is the three faces of throwing based on your experience how is the rhythm connected to this?

Answer: Kuzushi, tsukuri, kake and a connection… 1) Kuzushi 2) Tsukuri, 3) Kake. 1,2,3, - that's the rhythm. (GB: So by using 1,2,3 - this is a kind of rhythm?) Yes, that's right.

Question4 - what aspect of training have been an important part in rhythm development

Answer: Uchikomi and nagekomi. Especially nagekomi is necessary

Question5 in what ways can you help your students to develop rhythm in randori

Answer: You can't really get a rhythm up in randori, so for example you can combine more than one technique in uchikomi - like renraku-waza where you combine several techniques. You can build up a rhythm through repetitious uchikomi

Question6 please can you describe to me what is rhythm in judo for you?

Answer: I think you need to have rhythm in order to throw your opponent. It's important to begin a move by moving your body rhythmically.

Question7 Coaches mentioned the important of rhythm in randori in order players to transmit rhythm into to shiai two, please explain more, why this is important?

Answer: Building up rhythm makes it difficult for your opponent to anticipate your move (waza). They don't notice - you are preventing them from noticing. If you don't move rhythmically, your opponent can defend themselves against your move. If you move well rhythmically and then perform a waza, it is becoming more difficult for your opponent to defend themselves. Also your opponent could lose their ability to focus on your intended waza. Let me clarify, if you perform a waza without any prior movement, your opponent will counter. But if you perform a waza having built up a rhythm, your

opponent won't be able to anticipate the technique (waza) you are going to use and therefore will find it difficult to counter.

Question8 rhythm can be a tool during the training but during the fight how can the player break the opponent rhythm?

Answer: (How to break the opponent's rhythm…? That's a difficult one!) Perform a waza that your opponent has not anticipated.

Question9 please can you explain more about why it's important to break the opponent's rhythm?

Answer: Probably a psychological reason. By breaking their rhythm, you cause your opponent to waiver and it unbalances them

Question10 we are coming to the end of this interview now is there anything else you would you like to add?

Answer: It's very difficult to define rhythm (in judo). In music it is said people have a 'sense' of rhythm and in sports, too, it is said some athletes have this sense while others do not. Is that the rhythm you mean?

Question11 what was like for you to do this interview?

Answer: I'm not entirely clear as to the purpose of the interview.

Question12 did you find it easy or difficult?

Answer: Difficult!

Interviewee - 2Mit

Question1 ukemi is fundamentally the first thing practitioners learning in judo, how does ukemi relate to rhythm? and if so, how does it relate

Answer: The basic principles of ukemi in judo form is a circle. Ukemi in judo is circular. So, teaching ukemi to beginners is a very important thing for judo technique. All judo techniques form is a circle. Throwing an opponent is also a circle. All judo techniques are circular in form. So, when teaching ukemi teaching rhythm to beginners during practice is particularly important from the point of view of judo technique. Improvement of judo techniques necessitates a solid understanding and practice of ukemi.

Question2 Coaches mentioned tai sabaki as a tool for athletes to use their body rhythmically, please can you explain more? How can tai sabaki can teach the athlete to use his body rhythmically?

Answer: In a normal situation tai sabaki refers to tachi-waza tai sabaki. However, I think that there are two kinds of tai sabaki - tachi-waza tai sabaki and ne-waza tai sabaki. In this interview, I will base my answer on tachi-waza. Tai sabaki is very important for maintaining correct posture when performing waza on your opponent or defending yourself from their waza. In order for athletes to improve their technique, it is exceedingly important that they repeatedly practice and gain a firm understanding of the logic of the fundamental principles of judo -shizen-tai (natural posture), jigo-tai (defensive posture), way of walking, control of your body turns. George was one of my students and I taught him ne-waza tai-sabaki. This ne-waza tai-sabaki is my speciality (the “Mitsumoto Special” tai sabaki.) I think you know this, George.

Question3 Kuzushi, tsukuri, kake, is the three phases of throwing, based on your experience how is rhythm connected to this?

Answer: Kuszushi, tsukuri, kake are one separate movement connected to make up one movement. However, mastering these moves takes a great deal of practice and time. While it’s easy to say these three words - kuzushi, tsukuri, kake - perfecting them takes a great deal of practice and time. So, you should not teach them as a set at first, you should teach each movement separately and thoroughly, then practice the first and then the second, then the second before moving on to the third. From a teacher’s point of view, this is the best way to practice. Once you have mastered and combined these moves, they can be used as part of the renraku-waza technique.

Question4 What aspects of training have been an important part in rhythm development?

Answer: Every athlete has their own sense of rhythm. As a teacher I see athletes with varying levels of sense of rhythm - both good and less so. When I teach, I first get the students to work on various rhythms via the same training programme. When I watch the practice and see some students showing good rhythm in tachi-waza, or others showing good rhythm in ne-waza… For example, those who have good rhythm in ne-waza - their body is extremely supple and they have long arms and long legs… they would be better off practicing ne-waza than tachi-waza as they would quickly become

good competitive athletes. Neither students nor teachers, can set a time for the development of a good athlete. So, to get a student to develop into a good athlete quickly in a short time, the teacher should look out for good rhythm in ne-waza or tachi-waza and focus on the techniques which are best rhythmically. I think this is an important part of a teacher's function. I normally teach the same thing at first but also point it out if it is better they focus on a certain technique. It's important in my role as a teacher.

Question5 in what ways, can you help your students to develop rhythm in randori?

Answer: As I mentioned earlier, each athlete has their own sense of rhythm. First, in order to train up athletes to win competitions, the athletes need to develop a different sense of rhythm to other athletes. They need to find their *own* sense of rhythm and teachers need to develop a training programme that encourages that. In competition, athletes that reach the top have a very different sense of rhythm different to their opponents. So, it's important that teachers analyze that and avoid teaching the students the same way so that their students who are aiming to become top athletes develop a different sense of rhythm. If you develop the same sense of rhythm as your opponents, you won't become a top-level athlete. It's very important they train themselves in a different way.

Question6 Please can you describe to me what is rhythm in judo for you?

Answer: Although teachers should research a good training programme for their students, the students should also learn to develop their own sense of rhythm from that programme

Question7 Coaches mentioned the important of rhythm in randori in order for players to transfer rhythm into shiai too, please explain more, why this is important?

Answer: I believe that athletes who don't have their own particular sense of rhythm won't win - can't win in competition. Because a competition takes place for a fixed length of time, rather than watch and think about your opponent's rhythm, I think it's very important that athletes envelop their opponent in their own sense of rhythm. So Olympic level, world class medal-winning athletes have their own rhythm. That's why it's important to develop your own sense of rhythm.

Question8 Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?

Answer: As I mentioned earlier, it is very important to analyze your opponent. However, if you over-analyze, your opponent will seem powerful which will have a detrimental effect on your mental strength. So, while it is important to study them to a certain extent, too much analysis will put you at a psychological disadvantage. So, I think that rather than break your opponent's rhythm, it's more important to pull your opponent into yours.

Question9 Please can you explain more about why it's important to break the opponent's rhythm?

Answer: In order to win in competition, it's more important to pull your opponent into your own rhythm.

Question10 We are coming to the end of the interview now. Is there anything else that you would like to add?

Answer: I don't have anything to add but, I may have answered a number of questions in the same way. However, please take those things into consideration….. In Japan, Judo embraces something called shingitai - body, mind spirit - literally mind, technique, body. In training, physical strength alone is not enough. Judo is a martial art and these three words shin-gi-tai are associated with it. Similarly, to kuzushi, tsukuri, kake, they can't be split into three separate entities. Top-level athletes are able combine them into one.

Question11 What was like for you to do this interview?

Answer: It has taken me back to my university teaching years and it was really interesting.

Question12 Did you find it *easy/*difficult?

Answer: I didn't find it difficult. I think you had some very good questions there. When a coach instructs students, they shouldn't teach 100% of the time, 70 - 80% should be teaching but the remaining 30% is down to the students themselves. No matter how good the athlete, if their heart is not in it, they won't excel. It's difficult to explain but even if they got lucky and won a gold medal, if their heart is not in it, they won't become a gold medal winner in life. You are also a teacher, George, so I think you'll understand, even among gold medal winners there are lots of athletes who have won medals but do not succeed as they should do. So teachers should not limit themselves to technical instruction and I think that they if they fail to provide instruction that embraces the human side as well, then the athlete won't succeed as they should.

Interviewee – 3Kan

Question1 ukemi is fundamentally the first thing practitioners learning in judo, how does ukemi relate to rhythm? and if so, how does it relate

Answer:

Question2 Coaches mentioned tai sabaki as a tool for athletes to use their body rhythmically, please can you explain more? How can tai sabaki can teach the athlete to use his body rhythmically?

Answer: Tai sabaki is used when attacking and defending, because it's important that you don't move your body unnecessarily. A good, efficient tai sabaki is smooth. However, I think that receptive tai sabaki will de finitely bring out a good rhythm. That is to say, if you can build up a good rhythm in by repeating tai sabaki during practice, I think you will develop a better tai sabaki.

Question3 Kuzushi, tsukuri, kake, is the three phases of throwing, based on your experience how is rhythm connected to this?

Answer: The best kuzushi, tsukuri, kake isn't broken up - it can't be clearly broken down into the three separate movements. A really good kuzushi, tsukuri, kake is a flowing, continuous movement and not broken up. The technique of an accomplished practitioner is comparable to the unbroken movement of fast flowing water - one short rhythm. To give beginners a clear understanding of kuzushi, tsukri, kake, we usually teach them by employing the rhythm - 1, 2, 3. Beginners then practice this repeatedly so that they can learn to perform the move without a break.

Question4 What aspects of training have been an important part in rhythm development?

Answer: This is just my opinion but, there isn't any practice for improving sense of rhythm. The purpose of training is to polish attack and defence waza (techniques). However, by repeatedly practising uchikomi and nagekomi etc, you can achieve a good tempo in kuzushi, tsukri, kake and you therefore get a good rhythm. Also, in randori, if you can get a feel for the rhythm of your opponents movements, you can employ a well-timed waza. This results in randori with a good rhythm

Question5 in what ways, can you help your students to develop rhythm in randori?

Answer: In my experience, there isn't really any particular training for improving the sense of rhythm. However, in randori (we) teachers will give students feedback when they perform a well-timed waza and when they don't. If they can get a feel for their opponent's attack rhythm, they can perform a well-timed waza. And, when you defend yourself agains your opponent's waza you should be able to time the counter well, too. It's important to pay attention to your own rhythm and timing during practice

Question6 Please can you describe to me what is rhythm in judo for you?

Answer: When you have a good rhythm… A good rhythm in repeated practice of nagekomi and uchikomi is a sign of improvement of waza (technique). If there is not a good rhythm in the one continuous movement of kuzushi, tsukri and kake, the waza will not be smooth. In randori, a well-timed waza occurs when you have a good understanding of your opponent's rhythm and that's why it is very important that you have a feel for your opponent's rhythm

Question7 Coaches mentioned the important of rhythm in randori in order for players to transfer rhythm into shiai too, please explain more, why this is important?

Answer: I'm not entirely sure about this question but, at the competition stage, there is practice specifically aimed at shiai (competition). It can be said that it is important that the rhythm that the judoka developed in randori can be transferred into competition, and the waza perfected during practice should be used in shiai.

Question8 Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?

Answer: Firstly, the opponent's movement is an attack and defence move. That move needs to be understood or anticipated. Even if this movement doesn't have a regular rhythm, there will still be a little cycle. This could be seen as a trait of the opponent's movement. So I think that, first, it is important to grasp that concept. To break your opponent's rhythm, when your opponent tries to attack, you need to understand what waza to use, That's how to break their rhythm. Conversely, you must not let your opponent anticipate your own rhythm, which you do by avoiding building up a regular rhythm in your attack which you do by moving (countering) slowly then quickly to hide your intention of attack.

Question9 Please can you explain more about why it's important to break the opponent's rhythm?

Answer: The answer is similar to the answer as I gave earlier. You should have a good grasp of your opponents usual movement, that is to say their rhythm, and anticipate their movement. If you do then you will be able do attack and defend with good timing. It will help you break your opponent's rhythm and prevent your opponent from attacking and defending smoothly. As I said before, there are times when it can break your own rhythm. In order to prevent your opponent from anticipating your rhythm it is important that your break theirs.

Question10 We are coming to the end of the interview now. Is there anything else that you would like to add?

Answer: I talked to George about this when I was in England, but the main thing is how rhythm should be defined. The meaning of rhythm is something that repeats itself - periodical repetition. So I think that in order to pursue this research it is important to correctly define 'rhythm'. In Japan, we don't really use the word 'rhythm', we usually use the word 'timing'. In order to time attack and defence moves well you have to understand your opponent's rhythm. Also in Japan, good rhythm occurs when kuszushi, tsukri and kake timing is smooth

Question11 What was like for you to do this interview?

Answer: Difficult! However, it was very interesting to consider rhythm in judo in this way. I have one thought about rhythm. Practicing repeatedly with good rhythm is necessary for improving waza (techniques). Good rhythm feels good and can be motivating and makes it easier to do repeated practice. Repetition in practice is easy and so if your rhythm is good you can practice for longer.

Question12 Did you find it *easy/*difficult?

Answer: Quite difficult. Like I said, we have to consider what rhythm in judo is. It's a very difficult concept

Interviewee – 4Yam

Question1 ukemi is fundamentally the first thing practitioners learning in judo, how does ukemi relate to rhythm? and if so, how does it relate

Answer: Yes, I think ukemi relates to rhythm. The reason for that is that ukemi is associated with the same repetitive movements so rhythm is very important when it comes to teaching your body to familiarise itself with those movements. Take, for example, ushiro ukemi. When you roll over and hit your hand down, normally your body and head falls back doesn't it? Your neck and your head, that is. You actually need to move them in the other direction and so it's necessary to practice those movements repetitively and it's important to do this rhythmically.

Question2 Coaches mentioned tai sabaki as a tool for athletes to use their body rhythmically, please can you explain more? How can tai sabaki can teach the athlete to use his body rhythmically?

Answer: Judo is about opponents, human opponents, so you need to have a good understanding of a human's movements. Humans move forwards, backwards, sideways, diagonally. Your opponent will move in those ways and their balance will also adjust itself. If you feel those movements in your own body it will empower you, and that is very important in judo. So, tai sabaki has an important role. It is important therefore to repeat those movements and teach your body to get a strong feel for them, and tai sabaki can be really helpful in achieving this. Tai sabaki is very important in learning those movements and therefore rhythm is also important.

Question3 Kuzushi, tsukuri, kake, is the three phases of throwing, based on your experience how is rhythm connected to this?

Answer: When Japanese perform waza, uchikomi and nagekomi are both very important. Especially with Japanese athletes and in Japan uchikomi and nagekomi are regarded as highly important. Again, this should be practiced repeatedly in a rhythmical way so the body remembers the moves. And as I said, the practitioner should keep kuzushi, tsukuri, kake in mind, and while knocking the opponent off balance, move into uchikomi or nagekomi and throw them well. In doing this the movements become smoother and as this smoothness is connected with the speed of the waza. So I think that keeping kuszushi, tsukuri and kake in mind helps with the smoothness and improves speed which in turn helps improve the waza.

Question4 What aspects of training have been an important part in rhythm development?

Answer: I think that uchikomi is very important. If your body gets a good feel for this move it leads to nagekomi. Also recently we are often including agility training, for example ladder training, in practice sessions. (Alex: I clarified 'ladder training' at the end)

Question5 in what ways, can you help your students to develop rhythm in randori?

Answer: Understanding your opponent's movements. First it's probably better for the ashi waza to be smooth and within leg techniques, ashi-barai, de ashi-barai and okuri ashi-barai. The reason I say that is that timing becomes exceedingly important in ashi barai waza where power isn't so effective. When you apply less force you need to synchronise your movements with your opponents for them to be effective. Also you can use feints and learn to get a feel for your opponent's movements in randori practice both of which are also very important. For example, look as though you are going to do seoinage but do kouchi-gari instead, or another example, look as though you are going for uchi-mata but then do nage-otoshi instead.

Question6 Please can you describe to me what is rhythm in judo for you?

Answer: I think rhythm is very important. For example, in general athletes who are skilled at waza techniques - who have effective and dynamic waza techniques, and those who are very good at nage-waza - they all have a good feel for rhythm. Most athletes with a good sense of rhythm like that, and I'm not sure if this just relates to Japan or not, are those started learning early in life. They have good dexterity, skillful movements - for example. That kind of ability is easy to develop at a young age, so practitioners who started when they were very young, have an advanced sense of rhythm and movement. I think in judo, with uchikomi etc. as I mentioned earlier, sense of rhythm should not just be treated as an important aspect, but thought of as second nature.

Question7 Coaches mentioned the important of rhythm in randori in order for players to transfer rhythm into shiai too, please explain more, why this is important?

Answer: Things you learn in practice will be brought across to competition. The rhythm learnt in practice is necessary to give you an edge in competition. To put it another way, when you get nervous you tense up - get nervous, you'll lose your own rhythm.

Question8 Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?

Answer: Research / study your opponent. There isn't a huge number of really top-level practitioners, so analyse videos etc. of their moves; look for habits and specialities to help you break your opponent's movements. For example, if they move sideways a little you move a little the other way, prevent them moving into their intended waza, when pulling back if they are good at kakeru-waza when pulling back, then don't let them make that move.

Question9 Please can you explain more about why it's important to break the opponent's rhythm?

Answer: Rhythm is embedded in the body. If they can make those movements, the practitioner will feel that they are performing well, at their own pace, and performing

well in the competition. If that rhythm is broken, they will feel that something is off. You learn to have a feel for things. I think that that is very important in order to win.

Question10 We are coming to the end of the interview now. Is there anything else that you would like to add?

Answer: No, I think I have covered everything.

Question11 What was like for you to do this interview?

Answer: Very interesting. I haven't really thought about rhythm in this way. So, by answering these questions I have had a good chance to look again at this for myself.

Question12 Did you find it *easy/*difficult?

Answer: Half and half. As I said earlier, since I started judo repetition… rhythm in judo has become second nature. I hadn't really thought about it. This interview pushed me to rethink it. There were some tricky parts but…

Interviewee – 5Kom

Question1 ukemi is fundamentally the first thing practitioners learning in judo, how does ukemi relate to rhythm? and if so, how does it relate

Answer: Where fundamental techniques are concerned, ukemi doesn't relate to rhythm. It's solely protection of one's body.

Question2 Coaches mentioned tai sabaki as a tool for athletes to use their body rhythmically, please can you explain more? How can tai sabaki can teach the athlete to use his body rhythmically?

Answer: My interpretation of 'rhythm' and your definition are possibly different. In English I would say 'pace'. I think of rhythm as pace. So, when you perform waza, if I say it in English, 'changeable pace'- changeable pace to control your opponent.

Question3 Kuzushi, tsukuri, kake, is the three phases of throwing, based on your experience how is rhythm connected to this?

Answer: There are two things. The first is the rhythm within your own body, hands and feet coordination related to your own body - feet, hands, body turn - that kind of rhythmical coordination of your own body. That's the first. The second is the relationship, 'relative situation, 'relative phase', the different rhythm between you and your opponent. The rhythm between you and your opponent is different - change the rhythm.

Question4 What aspects of training have been an important part in rhythm development?

Answer: In judo it is important you aim to hold your posture in a way so as not to be unbalanced by your opponent. That is stable - you have key core stability. So, you need to practice and get your body to remember fast moves in order to unbalance (your opponent).

Question5 in what ways, can you help your students to develop rhythm in randori?

Answer: Movements in general, fast movements are important. For randori, counter uchikomi is important - uchikomi including counter uchikomi.

Question6 Please can you describe to me what is rhythm in judo for you?

Answer: As I said earlier, changeable pace. When you attack - changeable pace.

Question7 Coaches mentioned the important of rhythm in randori in order for players to transfer rhythm into shiai too, please explain more, why this is important?

Answer: Waza practice in judo is - that's general practice - is your automating own movement, practicing so your movements become second nature. Regular practice extends into competition. So, if you are able to employ those automated moves at in competition, you'll be at an advantage.

Question8 Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?

Answer: There are two ways. The first is to anticipate your opponent's attack move - predict the waza. The second is defending yourself against and controlling your opponents move, grapple.

Question9 Please can you explain more about why it's important to break the opponent's rhythm?

Answer: The aim of judo is throwing your opponent off balance. That's why it's important.

Question10 We are coming to the end of the interview now. Is there anything else that you would like to add?

Answer: Not so much a comment but the word 'rhythm' in Japanese is more often associated and used in reference to dance / dance excercise, but is an unfamiliar term in martial arts such as judo and we're not used to it.

Question11 What was like for you to do this interview?

Answer: The questions were interesting and perceptive but a bit abstract and general. A bit more competition level - mid to high level - might be a bit easier to talk about.

Question12 Did you find it *easy/*difficult?

Answer: Easy!

Interviewee – 6Ino

Question1 ukemi is fundamentally the first thing practitioners learning in judo, how does ukemi relate to rhythm? and if so, how does it relate

Answer: I think ukemi and waza in judo incorporate rhythm.

Question2 Coaches mentioned tai sabaki as a tool for athletes to use their body rhythmically, please can you explain more? How can tai sabaki can teach the athlete to use his body rhythmically?

Answer: In order to perform my waza moves smoothly tai sabaki is important. It's also important in order for defending yourself against your opponent's waza effectively, and important before performing a waza when throwing your opponent off balance. As for how to use tai sabaki and move your body rhythmically, judo is not just about arm and leg movements, good tai sabaki comprises arms, legs, body and sometimes head movements. I think that one of the tricks for performing tai sabaki well is the movement of all parts of the body as one.

Question3 Kuzushi, tsukuri, kake, is the three phases of throwing, based on your experience how is rhythm connected to this?

Answer: My answer relates back to the answer to the first question. Waza and ukemi are comprised of rhythm. I think that in nagewaza, these three - kuzushi, tsukuri and kake - are comprised of rhythm. If you only do one of them, then you won't be able to perform the waza. When you perform the waza, it's not just about performing when your opponent shows weakness, but in competition for example, even when your opponent is showing strength, I think there is a point where it is good to perform waza. In order to achieve that, it's very important this is practiced until the moves are completely understood and the body has been taught to remember the moves.

Question4 What aspects of training have been an important part in rhythm development?

Answer: I think that the most important is mastering through hands-on practice. That's basic moves like uchikomi or nagekomi - or, if you have cleared this level, the next step is to is turn up the pressure a bit. For example, getting your practice partner to put up more of a fight or move a bit more, or getting a third person to join and increase the pressure on you will also help improve waza. This is judo, so I think judo-related variety in practice is very important. Then you have randori practice, which is close to competition level, so if you practice this repeatedly you will get a feeling for competition. And I think that this also applies to training through certain skills outside of judo such as those used for running, weight training, or other building up skills in other sports. Also, image training - putting thought into practice is really important in judo if you want to improve. I think this part also applies to question five. One more thing, which includes randori - I think that while practicing repeatedly with one partner is a good thing, it is also important to partner other judo practitioners to try out various ideas in different situations and with different people. So, in randori etc. it's not solely about ippon with one partner, I think it's important to consider different patterns and evaluating them through practice.

Question5 in what ways, can you help your students to develop rhythm in randori?

Answer: I think I pretty much covered this in answer to question four.

Question6 Please can you describe to me what is rhythm in judo for you?

Answer: With my own judo, I was very aware the importance of rhythm and movement and it was foremost in my mind when I practiced judo. I put this rhythm to use in order to improve my game and, as judo is a combat sport, I always had an awareness of the need to break my opponents's rhythm. I practiced keeping both those aspects in mind.

Question7 Coaches mentioned the important of rhythm in randori in order for players to transfer rhythm into shiai too, please explain more, why this is important?

Answer: Basically, through judo not only are we learning and applying techniques for protecting the body, and strengthening the spirit, we are also part of the world of competition. Aside from the techniques mastered in randori, I constantly looked ahead and considered what I needed to take through to competition level from that which I learned in practice (sessions). As I explained in answer to question six, in order to perform well or in order to disadvantage my opponent - if that's the right word - in order prevent them from performing well, I kept rhythm in mind and used it in competition to do the best I could. The were may have been a few times, when something unexpected threw me off-balance psychologically and suddenly prevented me from making the move I wanted, but basically I think that humans move in ways that they are used to or have experience with. When doing judo considering and developing various ideas during regular practice sessions and then putting them into practice and then using things learned in daily practice sessions in competition is very important in order to improve. One more thing, instructor's advice is very important in order to improve. But in order to further improve your abilities and performance, you need to think things out for yourself - develop your own individual style.

Question8 Rhythm can be a tool during the training, but during the fight how can the player break the opponent's rhythm?

Answer: One way is through movement, for example, through your own waza. Or, break your opponent through the way you move your arm, leg, body, face, sometimes eyes, and I could include feint in this list. This can be another tool used in breaking your opponent. Another thing in judo is spirit - the spiritual strategy, spiritual battle between the two players. I think that in breaking the spirit, you can undermine your opponent's judo game - their rhythm and movements.

Question9 Please can you explain more about why it's important to break the opponent's rhythm?

Answer: At competition level, it enables you to give your best performance or, depending on how you disrupt your opponent's performance, enables you to perform in a way that is beneficial. I think this is not just limited to judo or sports, but is also found at work and other aspects of life.

Question10 We are coming to the end of the interview now. Is there anything else that you would like to add?

Answer: Please be sure to let me see this research when you are done. I'm looking forward to it. I have many judo colleagues who are specialists in different areas who are really pleased to see enthusiasm for judo spreading around the world. We hope to see the popularity of judo grow further. One thing that was a bit difficult was there were a few times that it was hard to understand 'rhythm' in judo so the answers given may be a bit strange. I am very happy that you invited me to take part.

Question11 What was like for you to do this interview?

Answer: Great fun!

Question12 Did you find it *easy/*difficult?

Answer: I'm not sure I completely grasped the definition of rhythm but I greatly enjoyed taking part.