Teaching Styles of Australian Tennis Coaches: An exploration of practices and insights using Mosston and Ashworth's Spectrum of Teaching Styles

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CERTIFICATION OF DISSERTATION

The work presented in this thesis is, to the best of my knowledge and belief, original except as otherwise indicated in the text. I hereby declare that I have not submitted this material, in whole or in part, for a degree at this or any other institution.

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ABSTRACT

Many educational theorists believe that there is no *best* teaching style. A common principle in the discipline of sports coaching is that coaches should base their teaching style(s) on a number of considerations. These include: the developmental characteristics and individual requirements of the player, as well as the subject matter intent. Apart from anecdotal reports, however, the subject of tennis coaches and teaching styles remains largely unexplored. It is unknown what teaching styles coaches are employing during coaching sessions and whether these teaching styles are associated with recommended pedagogical principles advocated by scholars. The insights with regard to teaching styles that underpin and inform the coaches' decisions to employ particular teaching styles during coaching sessions are equally undetermined. Perhaps this noted lack of information regarding teaching styles is due to the theoretical and practical difficulty of comparing the various terms and interpretations that tennis coaches enact in relation to their instructional practices. Arguably, many of these conceptions about teaching styles are not organised in a common theoretical framework but rather exist with the individual interpretations of tennis coaches. It has been anecdotally suggested that the terms used to define teaching styles largely lack consistency and uniformity and are frequently employed interchangeably. Conceivably, this has led to the perceived confusion and the absence of a definitive set of concepts and principles reflective of the tennis coaching process and effective practice within it. As diverse learning conditions and experiences are often created by employing different teaching styles, the necessity for coaches to understand and purposefully implement a range of teaching styles to achieve various learning aims and objectives is vital. Contrary to educational convictions and perceptions, however, the results from this study indicated a different view in relation to the recommended employment of a variety of teaching styles. The requirement for a tennis coach to possess the capacity to employ a range of teaching styles when appropriate is perhaps reliant on a number of considerations. Coaches must be prepared to cater for the diversity of players' learning needs, interests, preferences and developmental readiness or stage of learning. Additionally, tennis involves learning aims and objectives from the psychomotor (physical/motor skill), cognitive (decision making) and affective (enjoyment/motivation) domains. This might suggest the application of specific teaching styles to develop each learning area comprehensively. As no one teaching style encompasses all learning eventualities, an effective coach must have the capability to change, combine and transition between various teaching styles during sessions. To understand fully the holistic nature of sports coaching and to aid in the investigation of the teaching styles that tennis coaches employ, quantitative and qualitative research methods have been employed in this study. It was anticipated that the combination of self-report survey questionnaires, observations and interview methods would result in the creation of data whereby the qualitative findings complemented and extended the meaning of the quantitative results. It was also expected that this combination of research methods would more precisely focus on the entirety of coaches' practices and insights by revealing the multidimensional and intricate level exchanges that epitomise the complex reality of the everyday tennis coaching habits of Junior Development (JD) and Club Professional (CP) tennis coaches in Australia. This thesis presents the findings of research completed on the self-identified teaching styles of 208 JD and CP tennis coaches in Australia as well as the observed teaching styles of 12 tennis coaches from three 30 minute tennis sessions. As well as these observations, an additional coach participated in an extended observational period of 18 hours of

coaching at their local tennis club. This study also explored the coaches' insights of teaching styles in addition to the motivations that informed their decisions to employ particular teaching styles during coaching sessions. Therefore, a total of 13 coaches participated in the observation and interview of this study. Mosston and Ashworth's *Spectrum of Teaching Styles* (2008) (which is referred to as *The Spectrum*) was used as a basis for identifying the coaches' teaching styles.

The Spectrum (Mosston & Ashworth, 2008) consists of 11 landmark teaching styles that function as indicators that represent considerably different teaching and learning experiences. Located between the landmark teaching styles are many, if not an infinite number of, pedagogical variations that share similar, or approximate, but not precise, decision structures of the landmark teaching style(s) that they are located near or between. These variations are termed canopy designs. The results showed that JD and CP tennis coaches in Australia do not use a range of teaching styles during their coaching sessions throughout the year. The coaches were primarily observed employing a canopy design that approximated the decision structures of landmark teaching style Practice Style-B.

This study also indicated a lack of congruence between the landmark teaching styles that coaches' reported using during their coaching sessions throughout the year and the landmark teaching styles that they actually used. The survey questionnaire respondents reported using all of the landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008). When the video-recorded sessions of the coaches were coded, a total of two landmark teaching styles was actually observed. As a percentage of total time observed, the results from the 12 coaches indicated that they employed landmark teaching style Practice Style-B for 12.87% of the time and landmark teaching style Command Style-A for 0.18% of the time. The 12 coaches were also observed performing two canopy designs. A variation of landmark teaching style Practice Style-B (Canopy design Practice Style-B) was observed for 71.38% of the time and a variation of landmark teaching style Command Style-A (Canopy design Command Style-A) was observed for 10.40% of the time. Among the 12 coaches, no other landmark teaching styles or canopy designs were observed. The results from the extended observation period (18 hours) of the single coach revealed that as a percentage of total time, landmark teaching style Practice Style-B was observed for 13.42% of the time, and landmark teaching style Command Style-A was employed for 1.61% of the time. This coach was also observed using two variations of the landmark teaching styles. Canopy design Practice Style-B was employed for 72.05% of the time and canopy design Command Style-A was used for 9.44% of the time. No other landmark teaching styles or canopy designs were observed. The observed landmark teaching styles and canopy designs strongly correlated with the pedagogical principles associated with direct instruction guidelines. Direct instruction is commonly represented by the coach making decisions about what the students are learning in addition to *how* and *why* they are learning it.

The interviews demonstrated that the terms that the coaches used to describe teaching styles lacked consistency and accuracy and were often used interchangeably. It was also revealed that coaches were incapable of accurately describing and identifying their own teaching styles during their observed lessons. This suggests that coaches exhibit a reduced self-awareness of their coaching in practice. However, the findings established that despite the coaches' limited

awareness of the teaching styles they performed during the observed lessons, they were able to articulate the type of environment they wished to produce and the behaviours they wanted to encourage. For example, all the coaches (n=13) believed in asking the players questions, allowing the players to solve challenges independently, and not prescriptively informing the players *what* to do or *how* to do it. In spite of all the coaches advocating the employment of teaching styles that share similar pedagogical principles with indirect instruction, they were unable to explain the theoretical assumptions that underpin these practices. All the interviewed coaches stated that their choice and employment of a particular teaching style did not alter as a function of the age or ability of the players they coached. Modifying, changing or enhancing the practices of tennis coaches necessitates recognition that they can identify their coaching practices as well as understand the assumptions that inform these behaviours. Consequently, research that has the capacity to identify the teaching styles that coaches employ during coaching sessions and the underlying explanations of these practices presents a pathway for coaches to contest and reflect on the effectiveness of their practices. This might produce a more coherent connection between beliefs and practice. Exploring the teaching styles of tennis coaches may provide assistance in identifying *how* coaches facilitate learning and *why* coaches decide upon the application of teaching styles during coaching sessions. With an understanding and an awareness of coaching behaviours, theorising about current limitations becomes likely. The possible identification of different features within pedagogical behaviour among tennis coaches in Australia will be particularly crucial in the design of coach education programs and professional development initiatives. These findings may also extend relevance into sports coaching more broadly.

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LIST OF ABBREVIATIONS

ACC Australian Coaching Council

ASC Australian Sports Commission

CP Club Professional level tennis coach

GBA Game-Based Approach

GCAs Game-Centred Approaches

HP High Performance level tennis coach

IFITS Instrument for Identifying Teaching Styles

IOA Inter Observer Agreement

ITF International Tennis Federation

JD Junior Development level tennis coach

MCP Master Club Professional level tennis coach

NASP National Association for Sport and Physical Education

NCAS National Coaching Accreditation Scheme

NCPE National Curriculum Physical Education

QSA Queensland Studies Authority

QSPES Queensland Physical Education Senior Syllabus

TA Tennis Australia

TCA Tennis Coaches Australia

TCAs Technique-Centred Approaches

TCAV Tennis Coaches Association of Victoria

TGfU Teaching Games for Understanding

TGM Tactical Games Model

TPAA Tennis Professionals Association of Australia

The listed terms will be defined throughout the thesis

CHAPTER ONE: INTRODUCTION

The overview presented below will highlight the central role of the coach in the provision of sporting experiences and emphasise that in order for coaches to influence the improvement of sporting performance, the instructional practices used during activities are recognised as fundamental features. The presence of a variety of instructional practices a coach may employ during coaching sessions coupled with a variety of terms will also be canvassed to illustrate the complex nature of coaching. Following this, the research problem and rationale will be presented before an outline of the research questions that this study will explore and answer.

1.1 Sports coaching: Still much to discover

According to the European Coaching Council (2007), coaching is defined as "the guided improvement, led by a coach, of sports participants and teams in a single sport and at identifiable stages of the athlete/sportsperson pathway" (p. 5). A primary objective of coaching is to connect players in consequential goal-orientated activities with the aim of achieving instructional outcomes specific to an individual session or group of sessions (Mosston & Ashworth, 2008; Rink, 2013).

Coaches are fundamental to the provision of sporting experiences. Each year, numerous coaching practitioners from around the world offer players of all ages and abilities assistance and direction that serve to fulfil their sporting requirements and goals. According to Lyle and Cushion (2010), alongside professions such as "teaching and medicine, coaching is one of the most ubiquitous services across the globe" (p. 1). Subsequently, there has been a significant expansion in coaching research (Gilbert & Trudel, 2004) that has positioned the discipline of coaching as a valid academic field of study (Lyle, 2002).

Notwithstanding lengthy investigations from numerous empirical and theoretical viewpoints (Gilbert & Trudel, 2004), much remains unknown about coaching and instructional practices, positive or negative, across a range of settings and sports (Lyle, 2002; Armour & Jones, 2006; Cushion; Potrac, Jones & Cushion, 2007). Therefore, research that considers "what coaches do and why they do it, still offers much in developing our understanding about coaching" (Cushion, 2010, p. 44).

1.2 The coach: A key protagonist

It is stated that "the coach occupies a position of centrality and considerable influence in efforts to improve sporting performance" (Lyle & Cushion, 2010, p. 43). A coach's actions affects players' "behavior, cognitions and affective responses, and coaches can influence whether athletes learn and achieve at a high level, enjoy their experience, demonstrate effort and persistence, and develop a sense of confidence and self-determined motivational orientation" (Amorose, 2007, p. 33). If coaching is not provided in a correct or appropriate manner the outcomes may result in poor performance, low self-esteem, and high levels of competitive anxiety or burnout (Amorose, 2007). Consequently, it has been acknowledged that the words and actions of coaches impact not only on performance but also on the social and

emotional well-being and perceptions of the players they are coaching (Miller, 1992; Jones, Housner & Kornspan, 1997; Horn, 2002). Coaching has physical, affective, cognitive, behavioural and social features that ultimately impact on the practices of coaches (Lyle & Cushion, 2010). Provided that the coach's professional intervention is multidimensional and achieved in diverse contexts of practice it demands widespread knowledge and capabilities, adjusted to the specific conditions of the practice environment (Abraham & Collins, 1998; Cushion, 2010).

Preparing coaches to function effectively is multifaceted and problematic. The complex nature of coaching must be fully understood in order to design relevant programs to adequately meet the diverse needs of the contemporary coach. Launder (2001) indicates that coaching is a highly complex discipline that requires a vast array of knowledge, personal capabilities, dispositions and skills to be brought together in a dynamic, flexible way to manage and orchestrate complicated learning environments that are socially situated. He also suggests that "above all the coach must be the master of the instantaneous response in which professional and personal skills are skillfully fused and rapidly applied in complex environments to attain quality learner outcomes" (p. 2). A foremost function of sports coaches is to assist players in the development of skills required to perform effectively during competition. A key feature of this pedagogical process is "the activities in which coaches have their athletes engage in and the instructional behaviours used during these activities" (Ford, Yates & Williams, 2010, p. 483).

1.3 Instructional practices: Direct and indirect

Much has been written about the various instructional practices and behaviours available for coaches to employ during coaching sessions (Lyle & Cushion, 2010). Traditionally, the educational association between coach and player has been "largely autocratic and prescriptive in nature" (Jones, 2006, p. 43). Under these instructional conditions, the coach has been considered as the "sole source of knowledge and has been responsible for the unidirectional transmission of this information to athletes who have adopted a largely passive role in the teaching and learning process" (Jones, 2006, p. 43). The term most commonly linked to this instructional practice is direct instruction. Direct instruction implies a "highly structured, teacher-centered and controlled instructional environment" (Byra, 2006, p. 452). It is maintained that "highly active teaching, focused learning, and student accountability are inherent in the idea of direct instruction" (Rink, 2013, p. 152). Other terms that have been used to describe this instructional practice include: command, explicit, prescriptive and teacher-centred.

An alternative instructional practice that invites greater player decision making in relation to the *how*, *why* and *what* of learning is indirect instruction. This type of instruction regards the coach as a facilitator. The control of the learning process becomes shared between the player and the coach (Metzler, 2011). Players are encouraged to use problem-solving and explore solutions to various movement challenges. Within this pedagogical paradigm, the coach provides minimal to no instruction or feedback and is engaged in facilitating or guiding players to explore options and solve problems. This is achieved through techniques such as posing questions, summarising, reflecting and listening (Breed & Spittle, 2011). Other terms such as: student-centred, implicit, inquiry and guided-discovery have been used to

describe common but not identical pedagogical principles related to this instructional practice.

1.4 Instructional practices and the sports coaching literature

Literature has revealed significant progress in expanding our awareness of motor skill learning and the kinds of instructional practices that most effectively develop players (Farrow, Baker, & McMahon, 2008; Williams & Hodges, 2004, 2005). It has been identified, however, that a substantial intermission (gap) exists between the production of progressive and contemporary research evidence and its application in coach education (Farrow et al., 2008).

Research to date has indicated that direct instruction remains the most employed instructional practice in many sports (Miller, 1992; Millard, 1996; Kahan, 1999; Cushion & Jones, 2001; Potrac et al., 2007; Ford et al., 2010; Partington & Cushion, 2011). Although the provision of direct instruction is considered a critical component of the coaching process, empirical research has recommended caution about being excessively prescriptive and direct during practice (Williams & Hodges, 2005; Davids, Button, & Bennett, 2008). Additionally, coaching behaviours that relate to the accomplishment of a task – for instance, training and instruction and positive feedback – are commonly considered the most preferred by players (Chelladurai & Riemer, 1998; Reimer, 2007). In accounting for this phenomenon, Jones, Armour and Potrac (2004) indicate that coaches implement behaviours that they consider are compatible with the function of coaching. The tradition of the sport, the coaches' intuition, emulation of other coaches and previous socialisation as a player or a coach together serves to validate this notion (Cushion, Armour & Jones, 2003; Williams & Hodges, 2005; Cushion & Jones, 2006; Potrac et al., 2007; Ford et al., 2010). Accordingly, prominent concentrations of instruction mirror perceptions regarding effective and appropriate coaching behaviours that descend from previous playing and coaching experiences. These behaviours commonly duplicate and fortify an instructional and directive approach to coaching (Potrac et al., 2007). In many sports this has resulted in a customary traditional pedagogy that is exemplified by being highly directive, autocratic, didactic and prescriptive in character (Williams & Hodges, 2005; Potrac & Cassidy, 2006; Harvey, Cushion & Massa-Gonzalez, 2010).

Several researchers have identified potential limitations with the provision of high levels of instruction and feedback during coaching sessions (Williams & Hodges, 2005; Wulf & Shea, 2004). The frequent application of verbal instructions, demonstrations, and feedback is claimed to generate an excessive amount of information for players to process, thereby preventing engagement in the problem-solving process. Furthermore, it is asserted that the explicit nature of the content is readily forgotten and interrupts automatic motor processes, particularly when the learner becomes exposed to stressful and anxious situations (Jackson & Beilock, 2008; Masters, 2008). It is further suggested by some theorists that an overly prescriptive approach to instruction and feedback may result in a subordinate recollection and transfer of skill to competition when compared with a method where verbal instruction, demonstrations, and feedback are provided less habitually (Hodges & Franks, 2004; Wulf & Shea, 2004). In response to these asserted limitations, a more *hands-off,* approach to instruction has been encouraged (Renshaw, Chow, Davids & Hammond, 2010). According to these pedagogists, the

role of the coach is to offer opportunities for players to "engage perceptual, cognitive, and motor skills in the manner they would be used in competition, as well as manipulating the constraints of the practice environment so that players acquire skills through guided discovery rather than explicit instruction" (Ford et al., 2010, p. 486). The claims regarding the virtues of direct instruction, however, must be considered in light of various influential variables. These might include: the objectives of the coach, the age of the player, the skill level or stage of learning of the player, the size of the group being coached, the motivation of the player, as well as the complexity of the skill being learned (Bailey & MacFadyen, 2007).

1.5 Clarifying the terminology

The concepts in connection with instructional practices available for coaches to employ are represented by various terms and definitions, including: coaching or teaching processes, practices, styles, strategies, methods, instructional formats, models, and approaches. All these terms have primarily been employed interchangeably and have led to a variety of interpretations in educational literature (Bailey & Macfadyen, (2007). According to Callcott, Miller and Wilson-Gahan (2012) "the term teaching style is synonymous with techniques, approaches, methods, and/or pedagogy" (p. 79). Similarly, Ashworth (1998) has reported that teaching-learning processes have been directed by the following terms including: teaching models, strategies, styles, methods, behaviours, techniques and practices. In a review of the literature for data that clarified the specific definitions and distinct purposes of these terms, Ashworth (1998) found that these terms are:

- Common, frequently used, and often interchanged in our professional literature.
- Not in competition, but rather used as synonyms.
- Used to offer recommendations about how to structure the teaching/learning interaction. (p. 119)

It was also revealed in the review that "the data did not support any consistent or precise definition for these individual terms; rather the definitions of these teaching options (methods, styles, strategies, etc.) were arbitrary and personalised according to each author's usage" (Ashworth, 1998, p. 119). It is suggested that the inconsistent use and understanding of terminology create confusion and lead to the misinterpretation of events that ultimately limits educational practice (Mosston & Ashworth, 2008). In an attempt to provide a measure of definitional consistency in relation to these terms, a number of writers in the discipline of education have presented various explanations. For instance, Galton, Simon and Croll (1980) identified the description of teacher behaviour during dealings with learners as encompassing a teaching strategy within their concept of a teaching style. This was a notion originally proposed by Taba and Elzey (1964) (as cited in Mawer, 1983) and later expanded by Strasser (1967) (as cited in Mawer, 1983). According to Taba and Elzey, a teaching strategy includes a teacher's translation of aims into practice. Strasser extended this interpretation and identified various decisions that teachers may make prior to and during lessons to implement strategies. These decisions include: "organisational decisions (management of learning), curriculum decisions (what to teach), and instructional decisions (how to teach)" (Strasser, 1967, p. 5). In this definition, instructional decisions commonly relate to the teaching method that is

employed, for instance, “lecture, small group work, etc.” (Strasser, 1967, p. 5). During a lesson, these teaching strategies are instigated via transactions that occur between the teacher and the learner, which Galton, Simon, and Croll (1980) refer to as teaching tactics. Teaching tactics, for instance, may encompass class control, personal and social or cognitive functions. Once a teacher consistently implements a set of teaching tactics, it is then deemed their teaching style (Galton et al., 1980). In a study of primary school teaching by Bennett (1978) (as cited in Mawer, 1983) the term teaching style is fundamentally based on “descriptions of organisational and curricular strategies with little emphasis on teaching tactics” (Bennett, 1978, p. 5). According to Seidentop and Tannehill (1999) a teaching style is epitomised by the instructional and managerial environment for teaching and is largely viewed in the teacher’s interactions with the learners. These authors also suggest, “teachers can be ‘upbeat’, or ‘laid back’. They can be frequent interactors or infrequent interactors. They can be very challenging or very supportive, or even both at the same time” (p. 228). Seidentop and Tannehill differentiate a teacher’s instructional format from teaching style and describe the former process as “the different ways teachers organise the delivery of instruction and, particularly, how the student role changes as a result of the changing format” (p. 228).

Good and Brophy (1997) employ the term teaching method as an alternative to the term teaching style to describe “a coherent instructional program that is goal driven – designed to accomplish clear goals that are phrased in terms of student capabilities to be developed” (p. 359). Whitehead (1997) has indicated that a teaching style is a combination of strategies that are most commonly implemented with the characteristics of individual learners. In yet another definition, Macfadyen and Bailey (2002) suggest that a teaching style “is concerned with how an activity is delivered, rather than what is delivered” (p. 57). Therefore, a teaching style is a process chosen by the teacher for a certain circumstance in order to accomplish a specific objective (Bailey & Macfadyen, 2007). Similarly, Rink (2013) describes a teaching style as the *how* and *why* of delivering content, not the *what*. Metzler (2011) refers to teaching styles and teaching strategies as deliberate interactions between teacher and students that accomplish a series of particular outcomes. As all of the terms that have been discussed regarding instructional practices fundamentally focus on designing activities and delivering learning experiences for players, these terms have been incorporated into the term teaching style for the purpose of this study. According to Ashworth (2010):

> A teaching style can be defined as a plan of action that defines the specific decision interaction of the teacher or coach and the learner for the purpose of leading to the development of specific objectives in subject matter and behavior. (S. Ashworth, personal communication, March 2, 2010)

1.6 Selecting teaching styles: Considerations

It is advocated that the behaviour of coaches act as an avenue to link player understanding to the content presented in the session (Hall & Smith, 2006). Accordingly, it is crucial that coaches “consider the objectives of the session, so that he or she can determine whether given behaviours are relevant to the task” (Lyle & Cushion, 2010, p. 52). Effective coaches have the ability to “tailor their content and instruction to the specific learning readiness and interests of their students, by

integrating concepts and implementing teaching strategies that are responsive to the students' diverse needs" (Lyle & Cushion, 2010, p. 52).

Within this process, it is pertinent to note that "coaches should not necessarily follow a plan or style either rigidly or blindly without consideration of what is happening in front of them" (Lyle & Cushion, 2010, p. 52). It is argued that coaches ought to direct and guide individual players, but not "force or dictate their own will onto them – authentic coaching comes from collaboration" (Lyle & Cushion, 2010, p. 52). Moreover, perhaps the most vital behaviour "corresponds with the athlete's developmental needs and individual particularities" (Lyle & Cushion, 2010, p. 52). One concept that advocates the development of coaching content, practices and behaviours specifically designed to cater to player needs is the notion of differentiation (Graham, 1995; Tomlinson, 1995, Tomlinson, 1999). According to the differentiated instructional model (Tomlinson, 1999), coaches "respond to the needs of all learners, with consideration being given to the student's readiness, interest, and capabilities" (Whipp, Taggart, & Jackson, 2012, p. 2).

Similarly, Vygotsky (1997) states that "the fundamental prerequisite of pedagogics inevitably demands an element of individualization, that is, conscious and rigorous determination of individualized goals" (p. 324). It is argued that this notion of "responsiveness to diversity rather than imposition of sameness in coaching" (Lyle & Cushion, 2010, p. 52) has yet to pervade entirely the practices of coaches, with many adopting a *one size fits all* approach to coaching players (Lyle & Cushion, 2010). This viewpoint translates to a reduced collaboration between the coach and the player. However, the players' circumstances and contexts are not necessarily all the same, therefore a *one size fits all* approach may not suffice as an effective instructional guideline (Amorose, 2007). According to Reimer (2007), players have demonstrated varied preferences for and different reactions to the behaviours of coaches. Therefore, in social and relational settings, the differences of individuals inevitably play a crucial role (Smith & Smoll, 2007). In order to design an optimal learning environment, coaches should be "less concerned about a coaching style or behaviour and more concerned about whether whatever they do impairs or facilitates learning" (Lyle & Cushion, 2010, p. 53).

Coaches who possess the capacity to be receptive and flexible and who can differentiate their instructional practices are ideally positioned to augment learning outcomes for all their players (Cain, 1989). For that reason, "there is no one size fits all approach" (Lyle & Cushion, 2010, p. 54). Coaches must feel permitted to behave in a diversity of ways that could include direct or indirect instruction or a variety of teaching styles. Endeavouring to observe a specific way of instruction, coaches may lose sight of the fact that they need to be flexible to produce optimal learning conditions. Equally, coaches must be aware if they are unintentionally imposing an idiosyncratic ideology on the player. This is considered in contrast to affording that which will most effectively cater to the player's individual requirements in a fashion that is compatible with their individual learning. The role of the coach is to determine and address the multitude of challenges associated with learning a sport and to assist players to deconstruct these challenges related to sporting performance (Potrac & Cassidy, 2006). Cain (1989) suggests that the coach must provide players with the personal and informational resources for learning. It is argued, however, that in order to create independent players, who are capable of performing even in the absence of a coach, the role of the coach necessitates "more than either the one-directional

transmission of knowledge from coach to athlete or the total ownership by athletes of their own development" (Potrac & Cassidy, 2006, p. 40).

1.7 Sport pedagogy as an area of study

According to Armour (2011), sport pedagogy occupies "that complex and crowded place where sport and education come together in practice" (p. 2) and is concerned with learning, teaching and instruction in sport and Physical Education. Despite the absence of a universal definition, there exist a number of delineations regarding the conceptions of the term sport pedagogy. In an early definition, Crum (1986) suggested that sport pedagogy is "a field of scholarly work on the disciplined inquiry [into] all educational interventions in the domain of human movement" (p. 212). Haag (1989), asserted that sport pedagogy "deals with the educational aspects of physical activity, sport, play, games and dance" (p. 6). In another definition, Siedentop (1991) stated that it is "the study of the processes of teaching and coaching, the outcomes of such endeavours, and the content of fitness, Physical Education and sport education programs" (p. 320). However, Silverman and Ennis (2003) refer to the term Physical Education pedagogy rather than sport pedagogy. They claim that "the field of research in Physical Education pedagogy, sometimes called sport pedagogy in the international community" (p. 3) comprises three sub-fields consisting of: curriculum, teaching and teacher education (Tinning, 2008).

While there may not be a universal definition or a common term, Tinning (2008), contends that sport pedagogy is generally theorised as a sub-discipline of the academic field of sport sciences and consists of three complex dimensions which include: knowledge in context, learners learning and teachers teaching and coaches coaching. These dimensions, which underpin the subject matter of sport pedagogy, form the basis of effective teaching and coaching. With regard to research initiatives in sport pedagogy, fostering new knowledge with the intention of developing the learning experiences of participants and practitioners within these dimensions is a key focus (Tinning, 2008). Conducting research that explores the teaching styles of tennis coaches undoubtedly corresponds to the general research initiatives outlined in sport pedagogy.

1.8 The research problem

1.8.1 A paucity of data

In spite of the pedagogical assertions and considerations outlined in **Section 1.6**, few published accounts have reported on *how*, *why* or indeed *whether* sports coaches consider these pedagogical principles during coaching sessions. Mallett (2005) further contends that there has not been "much research that has examined what approaches teachers/coaches adopt and why" (p. 1). To the researcher's knowledge, and following a wide review, there is no published research with regard to teaching styles and tennis coaches.

1.8.2 Diversity of learning needs and learning domains

As diverse learning conditions and experiences are often created by employing different teaching styles, the necessity for coaches to understand and implement purposefully a variety of teaching styles to achieve learning outcomes would seem paramount. Coaches must be prepared to cater for the diversity of players' learning needs, interests, preferences and developmental readiness or stage of learning. Additionally, tennis involves learning aims and objectives from the psychomotor (physical/motor skill), cognitive (decision making), and affective (enjoyment/motivation) domains. This might indicate the application of specific teaching styles to develop each learning area comprehensively. Various scholars also refer to the conative domain, however, this domain will not be explored in this study.[1]

As no one teaching style encompasses all learning eventualities, the capability to change, combine and transition between various instructional practices during sessions would seem desirable. Despite this, current research suggests that coaches are primarily employing teaching styles that are direct. (Miller, 1992; Millard, 1996; Kahan, 1999; Cushion & Jones, 2001; Potrac et al., 2007; Ford et al., 2010; Cushion & Partington, 2011).

1.8.3 Awareness

To impact on the practice and behaviour of coaches requires that they acknowledge what they do, in addition to explicating the assumptions that underpin and inform their coaching (Harvey, Cushion & Massa-Gonzalez, 2010). It is considered crucial to have an awareness of their assumptions about learning (Light, 2014) as well as an understanding of the "intended learning outcomes of the training session or part of a session" (Mallett, 2005, p. 6). This is a challenging process further confounded by the assertion that coaches often have a low self-awareness (Smith & Smoll, 2006). Cushion (2010) asserts that "coaches are notoriously poor at describing their own behaviour … Research has demonstrated that coaches have limited awareness of how often they behave in various ways" (p. 44). It is further suggested that teachers have a tendency to overestimate the frequency with which they report to using teaching styles, (Cothran, Kulinna, Banville, Choi, Amade-Escot, MacPhail, Macdonald, Richard, Sarmento, & Kirk, 2005; Mosston & Ashworth, 2008; SueSee, 2012). Launder (2001) has posited that as the instructional behaviour of sports coaches is often intuitive, they cannot always conceptualise or verbalise what they do and, essentially, "their knowing is in their actions" (p. 20). As a result, coaches may be incapable of providing a logical and coherent account of what they do. It also indicates that coaches may not realise the limitations attached to their instructional behaviour, nor perceive a requirement to alter or extend it (Launder, 2001). It is also asserted that the majority of educators in Physical Education and sport "hang on to what they know and feel comfortable with, especially if they have little or no access to new ideas or to mentors who might help them improve" (Launder, 2001, p. 20). It is reported that these experiences have a significant impact on "both philosophy and methods of sport educators, but it can

[1] Conation refers to "the mental process that activates and/or directs behavior and action. Various terms used to represent some aspect of conation include, intrinsic motivation, goal-orientation,volition, will, self-direction, and self-regulation" (Huitt & Cain, 2005, para. 1).

also lead to the continued use of old ideas and practices" (Launder, 2001, p. 20).

1.8.4 Conceptual framework and terminology

The importance of coaches basing their practice on a conceptual framework has been well documented in the literature (Lyle, 2002; Mosston &Ashworth, 2008; Metzler, 2011). A conceptual framework provides a general design and logical approach to teaching and learning. It offers clarity around the purpose and arrangement of activities that promote increased student interest, cooperation, and managerial effectiveness and more legitimate assessments of learning (Metzler, 2011; Mosston & Ashworth, 2008). In relation to the benefits of using a common conceptual framework Lyle (2002) has asserted:

> It is a necessary part of the development of a profession to have a (conceptual) model with which to demystify practice, to provide a common vocabulary, to form a basis for research and enquiry, to create a template for education and from which ideological approaches and individual value frameworks can fashion their contextual significance. There are many empirical questions that cannot be adequately framed as a consequence of the absence of such a [conceptual] model. (p. 22)

The concepts with regard to the various instructional practices available for tennis coaches to employ during their coaching sessions have been confused by the presence of various terms and coaching language (Reid, Crespo, Lay & Berry, 2007). Many of the commonly used terms lack consistency or uniformity and are usually viewed as interchangeable. Often their respective definitions are without conceptual agreement and exist within the individual perception of the tennis coach and the player. This has possibly led to confusion and the absence of a definitive set of concepts and principles reflective of the tennis coaching process and effective practice within it. The lack of information regarding the practices and insights of Australian tennis coaches is arguably due to the theoretical and practical difficulty of comparing multiple coaching practices. Many of these conceptions are not linked to a common theoretical framework.

1.9 Rationale

According to Rushall (2003) the practices and behaviour of coaches are primarily *belief* as opposed to *evidence based*. Some researchers have explored the activities that players participate in during practice sessions (Starkes, 2000), while others have employed observation to examine the instructional practices implemented by coaches during practice sessions (Lacy & Darst, 1985; Cushion & Jones, 2001; Mesquita, Sobrinho, Rosado, Pereira, & Milistetd 2008; Ford et al., 2010). Further research applying observation and semi-structured interviews to assess the *what* and *why* of the coaches' behaviour has also been implemented (Smith & Cushion, 2006; Partington & Cushion, 2011). All these studies, however, have focused on youth soccer coaches at the elite professional level. Despite the general quantity of behavioural research, the ability to derive consequential comparison from the work appears narrow, therefore the transfer of research findings from one context

to another cannot be casually asserted (Cushion, 2010; Harvey et al., 2010). In addition, coaching behaviours have tended to be largely explored in isolation (Ford et al., 2010).

Therefore, highlighting the teaching styles of coaches can provide an avenue for enhancing the awareness of coaches to what they are really doing during coaching sessions and why they are doing it. As Cushion (2010) affirms: "the most sophisticated understandings of coaching practice and advances in coach education would seem fruitless if coaches lack seemingly basic levels of self-awareness" (p. 44). Research that identifies teaching styles, in addition to exploring the underlying notions and explanations of such practice, proposes an avenue for practitioners to contest their practice and move from a "practice 'comfort zone', and open up to self-reflection" (Partington & Cushion, 2011, p. 2). As a consequence, the teaching styles of coaches are then directed by research evidence as opposed to a situation in which "uncritical inertia and the tools of critical reflection are provided to challenge pressures on practice that stem from culture and tradition" (Partington & Cushion, 2011, p. 2). According to Cushion (2010), this will enable a more lucid connection among coach behaviour, practice, context and the player's development and individual needs.

Despite an accumulation of descriptive behavioural knowledge pertaining to elite and professional youth sports coaches and descriptive understandings of practice structures in sports coaching, the discipline of tennis coaching remains essentially unexplored. To the researcher's knowledge, no published qualitative and quantitative research has been applied to explore the teaching styles that tennis coaches employ during coaching sessions and the motivations that underpin these practices. Modifying, changing or enhancing the practices of tennis coaches necessitates recognition that they can identify their coaching behaviour as well as understand the assumptions that inform these behaviours (Harvey et al., 2010). Research that has the capacity to identify the teaching styles that coaches employ during coaching sessions and the underlying explanations of these practices presents a pathway for coaches to contest and reflect on the effectiveness of their practices. This permits a clearer connection between beliefs and practice. Exploring the teaching styles that coaches believe that they employ in addition to the teaching styles that they actually use as well as exploring the reasons that underpin these practices will provide assistance to identify *how* the coach facilitates learning during coaching sessions and *why* coaches decide upon the application of teaching styles during coaching sessions. With a greater understanding and awareness of coaching behaviours, the possibility of theorising about current limitations becomes likely (Abraham & Collins, 1998).

The identification of different features within pedagogical behaviour among tennis coaches in Australia will be particularly crucial to enhancing coach education programs – namely, on a content and learning strategies basis. Owing to these reasons, it would appear necessary for coach education providers to understand which teaching styles tennis coaches are presently employing and if they are using a range of teaching styles as recommended by coach education providers. Establishing the coaches' motivations that serve to guide these practices is also a valuable initiative.

The purpose of this thesis is to analyse, explore, understand and present, through the employment of a survey questionnaire, observations and interviews, empirical evidence of the teaching styles that tennis coaches believe they use and actually implement during coaching sessions and their views, understandings and interpretations that underpin these practices. More precisely, the aims of the research were to pursue answers to the following research questions:

1.10 Research questions

1. What teaching styles do Junior Development (JD) and Club Professional (CP) tennis coaches in Australia believe they are using during coaching sessions throughout the year?

2. What teaching styles are Junior Development (JD) and Club Professional (CP) tennis coaches in Australia actually using during coaching sessions?

3. What are the coaches' insights of the teaching styles they employ during coaching sessions?

It was anticipated that the combination of self-report survey questionnaires, observations and interview techniques would result in the creation of data whereby the qualitative findings further illuminated the meaning of the quantitative research techniques. In fact, it was hoped that this blend of research methods would more precisely focus on the entirety of coaches' behaviour and insights by revealing the multidimensional and intricate level exchanges and interactions that epitomise the everyday and complex reality of the dynamic coaching process confronting JD and CP tennis coaches in Australia.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The aim of this chapter is to explore and examine the ideas considered in current literature and to utilise sources that substantiate the presence of the problem under investigation. Moreover, it is the intention of the literature review to offer grounds for legitimising the research questions, to validate the research methodology and demonstrate how this study uniquely contributes to the overall body of knowledge. At the conclusion of this chapter, it is anticipated that the reader will understand the existing body of knowledge (i.e., what we know), and where innovative and new research initiatives are required (i.e., what we need to know).

In commencing the literature review, it was decided to provide an abridged account of the origins of tennis and tennis coaching in Australia. This brief *sketch* illustrates the rich historical context that tennis occupies in Australia's sporting cultural landscape. From these early beginnings, the review commences an inspection of the numerous instructional practices and behaviours available for coaches to employ and their associated theoretical conceptions. This outline is presented in light of how these practices have been shaped and influenced by related disciplines. It is here where the researcher considers related theories of learning and skill acquisition as well as recommended pedagogical practices for sports coaches to implement during coaching sessions. In establishing the theoretical conceptions surrounding pedagogical practices for sports coaches, *The Spectrum* (Mosston & Ashworth, 2008) is critically analysed and presented as an appropriate theoretical framework to assess the behaviours of tennis coaches. Related research initiatives in the field of instructional practices and sports coaches are then reviewed and considered.

2.2 The origins of tennis

There is no definitive point in history when the game of tennis began. According to Brasch (1995), "the history of the game goes back into the distant past, and there are various explanations of its origins" (p. 355). One of the earliest accounts of tennis describes it as a "solemn fertility rite in Egypt and elsewhere in the Middle East" (Brasch, 1995, p. 355). Another, that describes a game of handball, was reportedly mentioned in "Homer's writings, as being played by Nausicaa, King Alcinous' daughter, and her personal maid servants in Phaecia where Odysseus was shipwrecked" (Homer as cited in Brasch, 1995, p. 355). Many argue, however, that it was the ancient civilisations in Greece and Rome that first played racquet and ball games similar to the ones we know now. Others suggest that it was not until the 18th and 19th centuries in France and England that modern tennis was born, when indoor sport such as real tennis and jeau-de-paume were played outside (Whitington, 1975). It is suggested that the word tennis is derived from the French expression "tenez, 'hold' or 'pay heed!', which was the player's call to his opponent before serving the ball" (Brasch, 1995, p. 355). It is said that Englishmen watching the 'the game with the palm' (jeau-de-paume) and "hearing the call repeatedly, took up to describe the game by that very expression" (Brasch, 1995, p. 355). Historical accounts, however, confirm that tennis was played in France in the twelfth century. These early games

involved using the palm of the hand only.

In 1858, a solicitor from Birmingham named Henry Gem marked off a court using the same dimensions and markings as those used for real tennis (which was radically different from those used in modern tennis). Using a rubber ball sewn together, Gem and a group of his friends, established the world's first lawn tennis club in 1870 (Whitington, 1975). Meanwhile the man many people credit with the invention of the modern game, Major Walter Clopton Wingfield, had been designing an outdoor game similar to that devised by Harry Gem and publicly released his innovation for the first time in 1869. The game, called sphairistike, (Greek for ball and stick), was still to be significantly reformed before it became a precursor to modern tennis. For instance, the Major's court was shaped liked an hourglass, narrower at the net than the baseline, and points could only be won by the server Nonetheless Wingfield's sphairistike sets, which sold for 25 pounds sterling, were purchased by many in the English upper class (Whitington, 1975). Following the success of Major Wingfield's sphairistike sets a multitude of similar kits with different names and different rules began to appear. The popularity of the game within the upper echelons of English society captured the attention of the Marylebone Cricket Club followed by the All England Croquet Club at Wimbledon. In 1875, a meeting was held at the Marylebone Cricket Club to determine a standardised set of rules for the sport of lawn tennis that forms the basis of the game to this day (Whitington, 1978). Wingfield's hourglass court was accepted, though its "waisted ladylike form was thickened to some extent" (Metzler, 1969, p. 4) by widening the net to eight yards and shortening the baselines to ten. The height of the net was fixed at five feet at the posts and four feet at the centre. Only one service fault was permitted and the serve must now land between the net and the service line instead of between the service line and the baseline (Metzler, 1969).

The game continued to flourish and in 1877, the first Gentlemen's singles Championship was staged. The hourglass court was no longer practical and the All England Club rules, superseding those of the MCC decreed a rectangular one. The net was to be five feet high at the posts and three feet three inches at its centre and a layer of flannel cloth was used on the balls. The new rules also stipulated that players must have one foot behind the baseline, and one fault was permitted. A ball falling on the line was considered playable, as were the net-cords during play, and the players were to change ends after each set (Metzler, 1969).

2.3 The introduction of tennis in Australia

As in England and America lawn tennis in Australia was initially played on the grounds of the wealthy in both the country and city areas but swiftly grew more competitive and widespread (Trengove, 2000). In 1878, the Melbourne Cricket Club constructed an asphalt court. In 1879 it laid down a grass tennis court and in January 1880 conducted the first tennis tournament ever played in Australia. This event was called the *Championship of the Colony of Victoria* and was won by A.F. Robinson. Not long after, the Sydney Lawn Tennis Club conducted its first New South Wales titles and the first inter-colonial games in 1885 between New South Wales and Victoria at the Sydney Cricket Ground. In the following years the Queensland, Victorian, South Australian and New South Wales Lawn Tennis Associations (in that order) were formed and over the next 20 plus years, tennis grew in popularity

(Trengove, 2000).

In the 1920s, tennis became increasingly popular with an international competition called the Davis Cup contributing markedly to the game's growth. Nowhere was interest higher than in Australia where tennis enthusiasts followed inter-club and interstate matches, state championships and various other events that have long since disappeared from tennis the calendar (Trengove, 2000). During this time, new clubs were formed and more local councils installed public courts. To cater for the growing numbers of players, state associations established large tennis centres at Kooyong and Rushcutters Bay in Sydney. The Australian tennis venues of Kooyong, White City, Milton and Memorial Drive would later become famous worldwide. Constructed in the early 1920s to accommodate Davis Cup crowds, Kooyong waited until 1946 to host its first match. White City in Sydney had to wait until 1951 to host the event (Whitington, 1975; Trengove, 2000).

Australia's victory over America in the 1950 Davis Cup was considered a highly significant moment in Australian sport. The win was extremely unexpected as Australia had failed in the previous four challenges but it would prove to be the beginning of a dominant era in which Australia would win the Davis Cup 15 times in 18 years (Trengove, 2000). From the 1950s, Australian men would dominate the world's major tournaments. Between 1950 and 1970 no fewer than fifty-five Grand Slam singles and sixty major doubles titles would be won by Australians. In 1962, Rod Laver won all four of the major international singles titles – the 'Grand Slam' – equalling the achievement of the great American tennis player Donald Budge. In 1969 Laver became the first and only player to date in history to have won the 'Grand Slam' twice.

The performances of Australia's women players, if not as outstanding as those of its men and in part due to conventions of the time and limited opportunities, had been highly admirable during the 1960s. Leading the Australian women's crusade was the highly talented and enormously successful Margaret Court (nee Smith). Court won 35 world singles titles, including: the Australian Open a staggering 11 times (seven of them consecutive), six United States singles titles, Wimbledon in 1963, 1965 and 1970 as well as winning the French singles title four times. In 1970, Court became the first woman to win the singles 'Grand Slam'. She was also one of three players to have achieved a career 'boxed set' of Grand Slam titles, winning every possible Grand Slam title – singles, same-sex doubles and mixed doubles – at all four Grand Slam events. Court is the only person to have won all 12 Grand Slam events at least twice and is often considered the greatest female tennis player of all time. During this period, which is often referred to as the *Golden Era* of tennis in Australia, "tennis courts were as ubiquitous as milk bars and war memorials and Australia was said to have the highest ratio of tennis courts to population in the world" (Trengove, 2000, p. 45).

2.4 Tennis coaching in Australia

While there have been coaches or *trainers* as they were referred to in Australia from the earliest days of sport "coaches and coaching came to prominence in the *golden era* of Australian sport in the 1950s and early 1960s" (Woodman, 1989, p. 204). According to Gordon (1961):

> Probably no single factor had more to do with the success of Australian sportsmen in the fifties than the coaching of Harry Hopman, Percy Cerruty, Franz Stampfl, Forbes Carlisle, Harry Gallagher, Sam Herford, Don Talbot and Frank Guthrie. All of them believe basically in conditioning and set their charges huge amounts of physical build up work … all of them have dickered (sic) to varying degrees with scientific methods of training. (p. 162)

A widespread trait of many Australian coaches of this era was their commitment to training their players more intensely than their "equivalents at any other time in history and, in many cases, harder in comparison to their competitors from other countries" (Phillips, 2000, p. 52). The aphorism 'no pain, no gain' seemed to typify the practice of the period with players experiencing "concentrated, demanding and repeated training sessions" (Phillips, 2000, p. 52). This practice was further justified by Franz Stampfl, a leading athletics coach in Australia at the time when he stated, "the skill of the child learning to write, the bricklayer working all day, and the pianist practicing for long periods did not degenerate, instead it becomes progressively better until it reaches the peak of which the individual is capable" (Phillips, 2000, p. 52).

One of the reasons offered for Australia's international tennis governance between 1950 and 1967 was the profound influence of Harry Hopman. Regarded as the chief architect of Australia's post-war tennis dominance, Hopman coached Australia to 15 Davis Cup victories between 1950 and 1967, and as successive surges of young tennis champions became ineligible for this amateur competition after yielding to the lure of professionalism, he nurtured the next wave of champions. Hopman initially developed prominent juniors Frank Sedgman and Ken McGregor into two of the pre-eminent tennis players in the world. When Sedgman and McGregor turned professional, following three successive Davis Cup victories, Hopman recruited teenage champions Lew Hoad and Ken Rosewall for further success. When they became professionals, he enlisted Ashley Cooper, Neale Fraser, Rod Laver, Roy Emerson and Mal Anderson who were followed in the late 1960s by John Newcombe, Fred Stolle and Tony Roche. Among the players who came to prominence under Hopman's tutelage, Sedgman, Hoad, Cooper, Fraser, Emerson (twice), Laver (four times) and Newcombe (three times) captured multiple victories at the spiritual home of international tennis – Wimbledon (Trengove, 2000).

Hopman's coaching practices concurred with those of Stampfl's coaching philosophy of hard work during training sessions. He was renowned for the value he placed on weight training, agility and fitness. Hopman believed "in a game where talent with little training had been the norm, and the need to train strenuously to attain success existed" (Phillips, 2000, p. 53). Hopman was also recognised for his high intensity tennis drills and workouts. These drills consisted of one player practising against two opponents. Hopman was primarily considered a strategist, trainer, conditioner and motivator. Cedric Mason was a student of Hopman's from 1952-1956 and trained at Kooyong with a number of Australia's most prominent tennis champions of that era. In relation to Hopman's instructional practices, Mason recalled:

> Hop (Hopman) was really a trainer, not a coach, he never talked about grips or swings or technique. He was into physical fitness. Lots of drills, two up

> two back (two players standing on the baseline and two players standing at the net) or two up and one back (two players standing at the net and one player on the baseline), Hop would either feed the ball in from the side of the court or have the net players do it (feed the ball into play). This would go on for a while! He'd just encourage you to work harder, move quicker, but no real instruction. After this though, you were instructed to just go and play sets against each other. (C. Mason, personal communication, March 4, 2011)

Mason's reflections mirror those of Neale Fraser – Australia's longest serving Davis Captain (24 years) and a member of the Australian Davis Cup team from 1955-1963 while Hopman was coach. With regard to Hopman's instructional practices, Fraser commented:

> Hopman was a physical trainer … he was rarely a coach. We did drills … two on one's, that was our main training for the Davis Cup … he didn't say much … he'd say c'mon, c'mon, you should have got that … and I learned from that (when I was Davis Cup Captain) and I did a lot of those things with my players, you know, when a guy was exhausted and I wanted a few more I'd say don't make an error. But Hopman's favourite expression was to "hit for the lines" … you know, hit it as far away from your opponent as you can … he rarely mentioned things about technique, it was drills and fitness. (N. Fraser, personal communication, October 20, 2013)

Australia's foremost tennis player of the first three decades of the twentieth century, Norman Brookes, received very limited formal coaching. Information available suggests that the acquisition of tennis skills during this time was not achieved as a result of coaching expertise but rather conveyed from experienced players to their protégés or by examining the champions and the application of their technique. According to Phillips (2000) players learned about the game of tennis by reading various publications that provided technical and tactical explanations in addition to illustrations. A common experience of some of Australia's greatest players, so many of whom ranging from Brookes, Patterson, Anderson and Crawford to Bromwich, Sedgman, Hoad, Rosewall, Emerson and Laver, received minimal or no professional coaching in their formative years. Learning the game through individual practice and by playing with siblings and parents was a common experience. Cooper's father introduced Ashley to the game by suspending a tennis ball from the roof of a verandah. Ashley and his brothers would practice swinging at the ball with a racquet while their father guided their strokes. According to Trengove (2000), "Not until they felt thoroughly comfortable with the racquet and could make strokes to their father's satisfaction were they allowed on a tennis court" (p. 107).

Each morning before opening their family operated grocery shop in Sydney, Ken Rosewall and his father would hit tennis balls for two or three hours on the court located next door. While not a player of any note, Rosewall's father was a keen student of tennis and imparted all the knowledge he had gleaned from instructional books, magazines and first-hand observation (Whitington, 1978). Like many others living in small outback towns in Australia, Roy Emerson depended on the game of tennis for basic recreation. Emerson grew up on a remote dairy farm in Blackbutt and played tennis with his parents and sisters on the customary ant-bed courts that were prevalent at the time. Similarly, Rod Laver who was brought up on a cattle farm at

Gladstone some 140 kilometres south of Rockhampton, learned to play tennis with his parents and two brothers on the family tennis court and travelled hundreds of kilometres "around the hot interior to play small tournaments on other primitive, sun-baked courts" (Trengove, 2000, p. 119). Tony Roche pursued tennis as a pastime mainly due to the lack of alternative diversions for a young boy in the small town of Tarcutta. With no local players to practice with it is reported that Roche:

> Spent long hours practising against the wall of his father's garage, on which he scrawled a series of numbers, each identified with a particular stroke. Roche became adept at keeping the ball in play while using the designated stroke to hit each number in turn. (Whitington, 1978, p. 45)

This information provides an illustration of the lack of formal coaching afforded to some players at the time. Those that did attend formal tennis coaching were commonly exposed to activities that consisted of drills (i.e., the coach hits balls to players who are standing in lines) in addition to rallying (i.e., players are hitting with each other). Neale Fraser attended his first tennis lesson at age 11 under the tutelage of Bill Sweetman. Fraser recalls:

> He (Sweetman) used to mainly do drills … he'd stand in the middle of the court with a basket of balls and he'd hit to you left and right. He mainly focused on the grips (how to hold the tennis racquet to hit various shots) and swings (how to swing the tennis racquet). He'd tell us how to do these things during the feeding drills and he was the top coach at the time. He coached me, my brother John (Fraser) and of course Mervyn Rose (two-time French Open winner and member of the Davis Cup team). (N. Fraser, personal communication, October 20, 2013)

At age 14, Fraser changed coaches and became the student of coach Brian Slattery. According to Fraser, Slattery's instructional practices were in stark contrast to those of Sweetman:

> He (Slattery) would have four people on the court hitting (rallying) crosscourt all the time … he would walk around and comment on each player. I don't remember him ever doing any drills … he was also another popular coach at the time. (N. Fraser, personal communication, October 20, 2013)

These contrasting coaching methods described by Fraser were typical of the practice conditions that many of Australia's tennis players, including Margaret Court and Evonne Goolagong-Cawley trained under (N. Fraser, personal communication, June 2, 2013).

A contemporary perception held by Australian tennis coaches, players, educators and enthusiasts is that the game of tennis has dramatically changed since the dominant years of the *Golden Era*. The game has transformed in almost all aspects, including: player professionalism, fashion, physical conditioning, racquet technology, stroke mechanics and court surfaces. Over the years, the clothing and shoes have become lighter and shorter to suit the demanding needs of the professional tennis player. The biomechanics of tennis strokes have radically

changed as players have learnt to exploit modern racquets that impart far more power and spin than their predecessors. Composite materials have replaced the wood and metal used 25 years ago, producing lighter and stiffer rackets with larger heads. Increased stiffness means less energy lost to the racket frame and so more power. A larger head creates a larger sweet spot with more margin for error, enabling a player to use a greater proportion of their strength without mis-hitting. Crucially, a larger head also allows more topspin to be applied so that the greater power can be controlled. In the past the focus of shot-making was on precision, swinging 'through the ball' to maximise the odds of hitting the sweet spot. Emphasis is now on racket speed and spin. Grips have changed. Now most players have a two-handed backhand and a more open stance on their forehand, hitting across the ball, making it swerve through the air. As strokes have changed, the nature of the game has changed too. For instance, few players now risk moving to the net to face fast-dipping ground strokes, and so the frequency of volleys, smashes, lobs and passing shots during matches has diminished.

While these changes have progressed naturally and seamlessly throughout the decades, the domain of tennis coaching has generated mixed views regarding its development and progression. According to Crespo (1999), when asked about whether the teaching of tennis has changed during the last 20-25 years, many coaches generally reported little or no change. Others reported that coaching has moved away from the "traditional technical 'stroke model' methodology towards a modern play/goal-oriented approach" (Crespo, 1999, p. 8). These changes in coaching methodology are evident in many formal accreditation coaching courses provided to aspiring tennis coaches by coaching associations throughout the world, including Australia.

2.5 The establishment of tennis coaching associations in Australia

Victoria was the first state in Australia to form an association of tennis coaching professionals (J. Bull, personal communication, November 2, 2009). While it is now called the Tennis Coaches Association of Victoria (TCAV) this small group of Melbourne coaches was known at the time as the Professional Tennis Coaches Association of Victoria (PTAV) and was established in 1946. For the next 15 years, similar organisations were established in most states around Australia until in 1960 this loose collection of state organisations was consolidated at a National level to become the Tennis Professionals Association of Australia (TPAA). Under the united banner of the TPAA coach education courses were delivered over a 12 month period with each state largely responsible for the design, content and delivery of their respective accreditation courses (J. Bull, personal communication, November 2, 2009). In 1983 under the guidance of Lawrie Woodman, a full-time development officer for the Australian Coaching Council (ACC), the TPAA complied with the National Coaching Accreditation Scheme (NCAS). The NCAS was developed to address the inadequacies of coaching in Australia that largely consisted of informal methods of coach education that often "resulted in experience that was haphazard, piecemeal and isolated" (Phillips, 2000, p. 99). The ACC was reconciled to tackling the challenges presented by the current status of informal coach education. They wished to provide, "for the first time on a large scale, the opportunities for coaches in many sports to develop their expertise in a logical, organised and cumulative manner" (Phillips, 2000, p. 100). The NCAS was first launched in 1979 by the

Commonwealth minister responsible for sport, Bob Ellicot, who recognised the scheme as one of the most important initiatives in sport at the time. It consisted of a four level coaching scheme ranging from an introductory coaching course (Level 1) to an elite course (Level 4). In 1995 the TPAA changed its name to Tennis Coaches Australia (TCA) and with the deregulation of the ACC in 1998 the newly titled TCA renamed all its accreditation courses and implemented new and rigorous coach education guidelines.

Since 1998, there have been significant changes in coach education and training in Australia. The primary differences relate to how course content is delivered and assessed. In June 2006, Tennis Australia (TA) launched competency-based coaching courses in addition to a new coaching pedagogy framework. The accreditation courses focus on assisting the coach to develop key competencies in a specific aspect of coaching and are delivered in a combination of formats ranging from oral presentations to on-court training in simulated and real-work environments. Coaches are also required to undertake workplace training to further improve their knowledge and skills in developing key competencies. Assessment is an on-going process and coaches are required to complete a variety of practical and written assessment tasks for each unit. The accreditation coaching courses are designed to deliver information that caters to the individual needs and experience of the coach. Four of TA's coaching courses form part of the National Coaching Accreditation Scheme (NCAS) and are considered a formal coaching qualification. These include: Junior Development (JD), Club Professional (CP), Master Club Professional (MCP) and High Performance (HP) coaching courses. TA also offers the Intro [Introduction] to Hot Shots and Community coaching course. These short coaching courses are not supported by the NCAS and are therefore not considered a formal coaching qualification. TA's coaching course pathway can be seen in **Figure 2.1**.

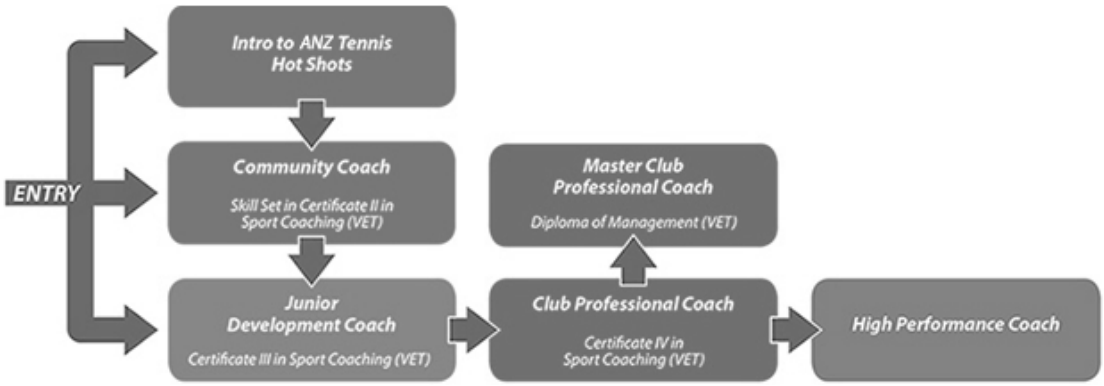

Figure 2.1 Tennis Australia coaching qualifications.

2.6 Formal accreditation coaching courses offered at Tennis Australia

2.6.1 Intro [Introduction] to Hot Shots

The Intro [Introduction] to Tennis Hot Shots coaching course was developed in 2009 and is an introductory coaching course conducted by TA and supported by the Australian Sports Commission (ASC). This coaching course is not part of the NCAS and not considered a formal qualification. The course offers an introduction and orientation to the field of tennis coaching and contains two major elements including, coaching principles and tennis specific coaching concepts. Participants do not receive a formal qualification on completing this course. There are no prerequisites for entry in this course.

2.6.2 Community

The Community coaching course is designed to train coaches to develop the skills of junior tennis players aged 4-12 years, with a focus on enjoyment and learner success. The principal focus of this course is to develop the participant's ability to deliver coaching sessions rather than to plan or construct lessons. The course is suitable for individuals who would like to begin working under the guidance of a qualified coach and aims to develop the participant's ability to deliver coaching sessions. The coaching course is also not part of the NCAS. There are no pre-requisites for entry in this course.

2.6.3 Junior Development (JD)

The JD coaching qualification is part of the NCAS and is designed to train coaches to develop the skills of junior tennis players aged 4-12 years, with a focus on enjoyment and learner success. The course also covers coach legal and ethical responsibilities, fundamental and perceptual motor skills, rules and tennis etiquette, self-reflection and program design for junior players as well as coaching methodologies. There are no pre-requisites for entry in this course.

2.6.4 Club Professional (CP)

The CP coaching qualification is supported by the NCAS and is designed to train coaches to become head coaching professionals at tennis clubs/centres and to develop the skills of more advanced players. The Club Professional Coaching qualification covers stroke production, tactical plans and sport sciences (biomechanics, psychology, physical conditioning and movement for tennis) in addition to coaching methodologies. The pre-requisite for entry in the CP coaching qualification include the successful completion of the JD coaching qualification.

2.6.5 Master Club Professional (MCP)

The MCP coaching qualification is designed to provide coaches and volunteer administrators with a competitive advantage in dealing with issues related to running

a tennis business/facility. This qualification is a Diploma of Management. The pre-requisite for entry in the MCP coaching qualification include: the successful completion of the CP coaching qualification.

2.6.6 High Performance (HP)

The HP coaching qualification aims to prepare coaches to work at the high performance level. Potential high performance coaches will be provided with a structured intensive learning program to further develop their knowledge and skills. Coaches will embark on a professional learning experience over two years. To be accepted in this course, candidates must hold a CP coaching qualification. Candidates should also be coaching advanced players since attaining the CP coaching qualification.

2.6.7 Instructional practices in Tennis Australia's accreditation courses

It is contended that the behaviour of coaches should act as an avenue to link player understanding with the ideas and skills that are pertinent to the session (Hall & Smith, 2006). Consequently, it is judged essential that the coach "considers the objectives of the session, so that he or she can determine whether given behaviours are relevant to the task" (Cushion, 2010, p. 52). According to Abraham and Collins (1998), the question: "is the coach's behaviour appropriate to the aim of the session?" (p. 66) is highly relevant and crucial to the outcomes of the coaching session. Educational units of competency that address coaching methodology form a critical component of the curriculum in all formal accreditation courses provided by TA. The contents of these particular units provide course participants with information pertaining to various instructional practices and coach behaviour during coaching sessions. The information presented in the courses concerning coaching methodology and instructional practices have, in part, drawn on Physical Education and sport coaching literature. The link between instructional practices employed in sport and those in Physical Education has been evident since the mid-1900s (Phillips & Roper, 2006; Van Dalen & Bennett, 1971). Since this time, there have been numerous developments relating to the instructional practices of Physical Education teachers and sports coaches.

2.7 Instructional practices: Physical Education and sport

2.7.1 Technique-Centred Approaches (TCAs)

The conduct and content of Physical Education in Australia throughout the early part of the nineteenth century was largely propelled by militarist physical training (McIntosh, Dixon, Munrow, & Willets, 1986; Phillips & Roper, 2006; Van Dalen & Bennett, 1971). Physical Education commonly consisted of drills that focused on technical proficiency that included: marching, military maneuvers and activities related to gymnastics (Kirk, 1998). The goal for students was to imitate the teacher-demonstrated activities as precisely and accurately as possible. During the early and mid-1900s the emphasis of Physical Education subject matter in North America, United Kingdom and Australia shifted from calisthenics and gymnastics to

sports and games (Byra, 2006). The growth and development of competitive sport during this time provided the impetus for the inclusion of games into the Physical Education curriculum (Oslin & Mitchell, 2006). Like gymnastics, however, the emphasis on the mastery and repetition of skills and technique remained the primary goal of games education. The underpinning philosophy of this instructional practice was that once the fundamental skills were mastered, the students would be able to play the game by applying the skills conducted in the lesson and placing them into the context of the game in a meaningful way (Light, 2013). This instructional practice is commonly based on analysing techniques that are considered fundamental to successful game play and founded on the notion that the development of technique must occur prior to playing the game (Blomquist, Luhtanen & Laasko, 2001). According to Guthrie (1952) a "skill consists in the ability to bring about some end result with maximum certainty and minimum outlay of energy, or of time and energy" (p. 136). Technique refers to the ability to perform the motor component of an action (Knapp, 1963).

An established lesson structure that typifies this instructional practice comprises a warm-up, followed by a sequence of drills that practice technique and then the implementation of the actual game (Werner, Bunker, Thorpe, 1996; Hopper & Bell, 2001; Stolz & Pill, 2012). Traditionally, 'effective teaching' was commonly associated with this rigid lesson format consisting of a linear process. Lessons would invariably commence with an explanation, demonstration, drill and practice of skills, lead-up activities and a game (Hoffman, 1971). According to Kirk (2010) this particular way of teaching has been the prevailing format for the instruction of Physical Education over such a long period of time that it has become known as "PE-as-sport-techniques" (p. 15). Oslin and Mitchell (2006) posit that "the technical or skill-based approach, which emphasises acquisition of skills before the introduction of rules and game play, remains the most commonly used approaches by both physical educators and sport coaches" (p. 628). Furthermore, the prominence of the majority of training programs for Physical Education teachers "was, as is now, on skill acquisition, measurement, and evaluation, which promoted the quantification of isolated techniques" (Oslin & Mitchell, 2006, p. 628).

It has been argued that TCAs have tended to overemphasise the isolation of skills from authentic and actual game related contexts during practice, task decomposition (the breaking down or segmentation of individual skills) during learning, and the role of repetition in the practising of skills to allow learners to transfer acquired techniques into game settings (Rink, 2013). It is also claimed that the execution of motor skills formulates only one element of functioning in games and is decidedly reliant on the context within which it transpires (Blomquist et al., 2001; Abernathy, Kippers, Mackinnon, & Hanrahan, 1996). Others have affirmed that technique-centred practices neglect the contextual quality of games in which learners must continually interpret and adapt (Brooker, 2000; Light & Fawns, 2003). TCAs have also been linked with drills which are deemed monotonous, appear meaningless and fail when learners use them in a practical game condition (Bailey & Macfadyen, 2007). According to Launder (2001) "traditional methods of teaching games do not cater to reluctant learners who are not willing to undertake the repetitive practice often associated with becoming proficient at sport" (p. 8). Berkowitz (1996), however, argues that "technical skill work still has its place, but never in isolation; always as it would be in the game and mostly as a means to accomplish the tactical problem" (p. 45). Additional terms that have been used to

describe analogous instructional practices include: traditional, technique-centred and skill-based.

2.7.2 Game-Centred Approaches (GCAs)

The proposition that games could be used to assist in the development of psychomotor skills was considered a "radical break with traditional, technique-based approaches" (Light, 2013, p. 14). The employment of games in teaching and coaching was evident during the 1960s and 1970s in the UK (Maulden & Redfern, 1969; Wade, 1967) and in France (Mahlo, 1974 as cited in Kirk, Macdonald & O'Sullivan, 2009). For instance, Wade (1967) as cited in Light (2013) proposed the implementation of "simple, small-sided games in soccer coaching to develop tactical knowledge and skill-in-context by maximizing player contact with the ball and to make training fun and enjoyable" (p. 14). During the same period Maulden and Redfern (1969) were questioning the more traditional instructional practices to teaching games and were advocating the development of games' skills within the context of the game. They highlighted the instruction of the social, moral, and intellectual components as well as the physical facets of games (Oslin & Mitchell, 2006). Additional concepts included:

> (a) Developmental stages in games, leading to the development of skillfulness, (b) use of a problem-solving approach through game-like situations to highlight tactical situations, (c) grouping skills according to generalized constructs (e.g., sending away, gaining possession, and travelling with an object, (d) games categories (net, batting, and running) as a way of addressing similarities and analyzing game play, and (e) games invention, as a means of giving children choice and an appreciation for the value of rules. (Oslin & Mitchell, 2006, p. 628)

In the early 1980s Bunker and Thorpe (1982), building upon the work of Wade (1967) and Maulden and Redfern (1969), proposed an instructional practice for Physical Education called Teaching Games for Understanding (TGfU). The introduction of TGFU (Bunker & Thorpe, 1982) has largely been considered the catalyst for discussions regarding pedagogical and theoretical aspects of games teaching (Holt, Strean & Bengoechea, 2002). It was originally developed in response to concerns that children were leaving school with:

> (a) Little success due to the emphasis on performance; (b) knowing very little about games; (c) some supposed skills, but in fact possessing inflexible techniques and poor decision making capacity; (d) dependence on the coach/teacher; and (e) little development as thinking spectators and knowing administrators. (Bunker & Thorpe, 1982, p. 45)

Unlike TCAs to teaching games, TGfU highlights the participation of students in a game situation where tactics, decision making, problem-solving and skill are developed concurrently. Isolated skill development is only utilised when the coach recognises the need for it. Bunker and Thorpe (1982) identified the tendency of games to motivate children and suggested that games could be designed to be developmentally appropriate and conditioned to highlight specific tactical situations.

They also suggested that games provided the contextual requirements needed to develop skilful performers and should therefore be a central feature of the lesson. The fundamental elements of TGfU include:

> (a) Game forms – use of a variety of developmentally appropriate game forms, (b) game appreciation – intentional use of rules to help children understand how rules shape games, (c) tactical awareness – promoting understanding of how tactics should be used in game play, (d) decision making – helping children understand "what to do" or the ability to recognise cues and predict possible outcomes during a game situation and "how to do it" or the selection of appropriate responses, (e) skill execution – producing the required movement in the context of the game, and (f) performance – "observed outcome" which should be a "measure of the appropriateness of the response as well as the efficiency of the technique. (Bunker & Thorpe, 1982, p. 10)

Prompted by TGfU (1982) there exist numerous "variations and other approaches that have been developed for teaching and coaching that are similar to it but which have been influenced to different degrees by local cultural or institutional contexts" (Light, 2013, p. 20). After experiencing a decline in interest during the 1980s (Holt et al., 2002) TGfU underwent a resurgence in the 1990s (Light, 2013). This revival was particularly evident in the US and was encouraged by "lively debate over the relative importance of tactics and technique in games and often in the form of a 'technique versus tactics' argument" (Light, 2013, p. 20). Emerging from this renaissance was the development of the American version of TGfU called the Tactical Games Model (TGM) (Griffin, Oslin & Mitchell, 1997). While some sport pedagogists and practitioners had been studying and applying the TGfU model without significant modifications, Griffin and others (1997) used the basic principles of TGfU to design the TGM that places equal emphasis on teaching sport concepts and skills (Gubacs-Collins, 2007). Griffin and colleagues (1997) also considered that TGfU demanded an extensive knowledge and tactical appreciation of games thereby excluding many teachers from employing the model. The TGM comprises tactical frameworks to assist teachers and learners to recognise tactical predicaments as well as solutions that are customary to games. Initial versions of the TGM were targeted at secondary Physical Education teachers. The selection of content and instruction during lessons was decidedly game specific which permitted a greater degree of exclusive tactical and skill complexity common to individual games. The employment of a progression of games incorporating tactical and skill practices presented in a game-practice-game structure to accommodate and assist teachers with lesson planning and instruction constituted a variation to the TGfU model (Oslin & Mitchell, 2006). In 2003 the TGM was broadened to cater for the teaching of games at elementary level.

The interest, however, in GCAs has not been restricted to the discipline of Physical Education. In fact, numerous youth sport projects and programs have been supported and promoted by national initiatives. Playsport and TOP play for instance, were developed by Thorpe to "address the needs of coaches, parents who did not know games well enough to implement TGfU" (Oslin & Mitchell, 2006, p. 629). While TGfU sees the teacher and coach develop games and "respond to problems to help students identify and apply solutions, Playsport and Top play do not have these requirements" (Oslin & Mitchell, 2006, p. 629). As an alternative, a series of

modified games and progressions are offered to match the readiness of the students. In this way, the coach simply follows the plan.

Game Sense (ASC, 1999; den Duyn, 1997) is another example of a GCA to coaching sport. Charlesworth (1994) first introduced the term Game Sense in his account of Designer Games – which is defined as games that "provide an environment in which tactical, technical, psychological, competitive and physical skills can be nurtured optimally" (Charlesworth, 1994, p. 30). Designer Games were developed to replicate match conditions in an attempt to encourage participation, focus on skills and fitness requirements in contextual competitive conditions and stimulate enjoyment. Within this instructional model, the role of the coach was that of a facilitator developing "situations where players have to think out the solutions for themselves (i.e., problem solving)" (Charlesworth, 1994, p. 31). Pill (2011) indicates that while Charlesworth's contribution in the advancement of coaching sport in Australia is evident, it was Thorpe's visit to Australia in 1996 that marked the significant moment in the development of Game Sense as a coaching approach in Australia (Pill, 2011). In 1996 Rod Thorpe from Loughborough University, conducted a series of TGfU workshops around the country. It was during this time that Game Sense was developed through cooperation between Rod Thorpe and the Australian Sports Commission (ASC). Game Sense is an Australian derivative of TGfU and is described as the application of games as a learning tool that permits tactical and strategic learning with skill development (den Duyn, 1997; Kirk & MacPhail, 2000; Pill, 2011; Light 2013). In 1997, the ASC developed educational resources consisting of a manual, video and set of activity cards that served to explain and demonstrate a range of modified games for teachers and coaches (ASC, 1999; den Duyn, 1997). These resources were available for a time on the ASC website. Game Sense encourages players to develop their own skills and understanding while being actively involved in the game. It places all learning within modified games to emphasise understanding, tactical awareness, decision making and the development of contextualised skill. The employment of questioning to stimulate thinking rather than telling players what to do presents as a key instructional aspect (Light, 2013). It has been suggested that Game Sense includes:

> Any coaching approaches that are game-based and employ questioning to stimulate thinking rather than telling players what to do … unlike TGfU there is no Game Sense model and it is more open to flexible interpretation. (Light, 2004, p. 117)

Comparable approaches have additionally been developed that are not immediate derivatives of TGfU but do share analogous pedagogy (Light, 2014). These include: the Tactical-Decision Learning Model (TDLM) (Grehaigne, Wallian & Godbout, 2005) from France and Play Practice (Launder, 2001) from Australia. Play Practice is another game-centred approach that recognises the important role of games in developing psychomotor skills. According to Piltz (2003) Play Practice, which evolved parallel to TGfU, provides a framework for coaches to guide the process of teaching "in and through games by defining the processes of shaping, focusing and enhancing the play" (p. 2). Shaping comprises the manipulation of variables such as playing space, numbers, rules, equipment, the nature of the objective, the scoring as well as the conditions to generate a particular learning situation. The concept of focusing ensures that priority is provided to specific components of skilled play. Finally, enhancing the play employs challenging strategies designed to engage the

interest in resolute play. Additional aspects of Play Practice entail the clarification of specific elements of game play such as technique, skill and decision making as well as the provision of a framework for the planning of learning experiences. It was also during this time that the creators of the Tactical Games Model (TGM) were assisting academics in Singapore to create a version of the TGM called the Games Concept Approach (GCA). This model was developed and endorsed by the Singapore Ministry of Education in 1999 as part of its Thinking Schools, Learning Nations Policy (Rossi, T., Fry, J.M., MacNeill, M., & Tan, C.W.C, 2007).

An additional instructional model that was influenced by TGfU is Sport Education. This model, like TGfU, emphasises tactical awareness and capacity over isolated skill development, thus the two approaches have much in common. According to Siedentop (2002), the primary objectives of Sport Education is to offer "authentic, educationally rich sport experiences for girls and boys in the context of school Physical Education" (p. 409). This pedagogical model encourages learners to partake in "seasons that are often two or three times longer than typical Physical Education units" (Siedentop, 2002, p. 409). From the outset students join teams and this association permits the learners to "plan, practice, and compete together, as well as benefit from all the social development opportunities that accompany membership in a persisting group" (Siedentop, 2002, p. 409). A *schedule of competition* is prepared prior to the commencement of the program that permits students "to practice and play within a predictable schedule of fair competition" (Siedentop, 2002, p. 409). At the conclusion of the season, a culminating event is implemented in order to assess the progress of students and to acknowledge success. For the purposes of "motivation, feedback, assessment, and the building of standards and traditions, records are maintained" (Siedentop, 2002, p. 409). According to Siedentop (2002) "the entire season is festive with continuous efforts made to celebrate success" (p. 409). Although Sport Education significantly contributes to the psychomotor domain by focusing on skilful performance, it also possesses a pervasive cognitive component in the form of developing tactical awareness and decision making (Butler & Griffin, 2005). Sport Education differs from how sport is typically conducted in children's and youth sport outside of school settings. All students are equally involved and receive the same opportunities to participate. Modifications, such as small-sided games are employed to the various sports to cater for the individual skill levels and tactical competencies of the students. Integral to the Sport Education experience is that students also learn to "referee, keep score, and keep performance statistics. Across several seasons, they will all get to be coaches, managers, team publicity directors, team trainers and other such roles" (Siedentop, 2002, p. 411). The theoretical underpinnings of Sport Education comprise the concept of play theory, which emphasises "the cultural perspective rather than the psychological or instructional perspective" (Siedentop, 2002, p. 414). As Siedentop (2002) notes, "the pedagogical features of Sport Education were developed more from my views of quality sport experiences than from instructional theory or the literature on effective pedagogical practices" (p. 414). In Australia, Sport Education is more commonly known as SEPEP, the Sport Education in Physical Education Program. The SEPEP manual was published by the Australian Sports Commission (Alexander, Taggart, Medland & Thorpe, 1995) and implemented through the National Aussie Sport Unit in schools (Pill, 2014).

The evolution of contemporary instructional practices including, Sport Education (Siedentop, 1994), Play Practice (Launder, 2001), TGfU (Bunker &

Thorpe, 1982) and its associated developments in Game Sense (Australian Sports Commission, 1999; den Duyn, 1997), Tactical Games Model (Griffin et al., 1997), Games Concept Approach (Wright, Fry, McNeill, Tan, Tan & Schemp (2001) and other cognitive approaches such as Tactical-Decision Learning Model (Grehaigne et al., 2005) collectively promote learners playing the game (modified and/or mini) as the principal organisational element of a session. According to Piltz (2006), all these instructional practices share common and complimentary teaching principles that entail:

> The importance of providing enjoyable, developmentally appropriate games and challenges that maximise participation and provide fair and inclusive involvement. Furthermore the coach or teacher is encouraged to foster positive relationships, plan relevant games based experiences, engage the learner, use a spectrum of methods, ask meaningful questions and provide feedback in order to develop competent, confident game players. (p. 2)

Breed & Spittle (2011) refer to these types of instructional practices as game-based approaches to teaching and coaching games that:

> Advocate playing the game (modified or adapted for the players' abilities) as the central organisational feature of a lesson. The modified games create constraints that emphasise certain game features in order to develop understanding as students solve the problems they are presented with. (p. 7)

2.7.3 Technique-Centred Approaches (TCAs) and Game-Centred Approaches (GCAs): The research

Much of the debate in relation to GCAs to coaching and teaching has fixated on a comparison with a *traditional* or TCAs (Oslin & Mitchell, 2006). While few would argue that such a simplified and decisive dichotomy exists between the two approaches, it is suggested that there are "fundamental differences between the conceptions of coaching and learning that underpin these two instructional models" (Light, 2004, p. 116).

TCAs are founded on the analysis of skills and techniques that are fundamental to playing games. The technical aspects of the particular sport are sufficiently developed before being employed in game-play (Light, 2003). Breed and Spittle (2011) suggest that TCAs "encourages teachers and coaches to focus on *how* to do a skill, before they teach *why*" (p. 8). In opposition, GCAs promote the development of technique within games or game-like activities (Light, 2003). Advocates of GCAs maintain that game-play comprises a number of essential qualities that contribute to the superiority of this practice. These include:

> (a) Children are motivated by games, (b) tactical similarities between games increase potential for children to transfer decision making skills from one game to another game, (c) games promote development of decision-makers, which assumes the use of problem-solving approach. (Oslin & Mitchell, 2006, p. 630)

The majority of discussions and research findings with reference to TCAs and GCAs have simplified the issue to the notion of sequencing – "Do you coach the isolated skill before tactics or tactics-before skill?" (Farrow, 2010, p. 14). When considered from this viewpoint, narratives and empirical evidence can be located in support of both approaches (Farrow, 2010). It is suggested, however, that the execution of motor skills contributes only one component of game-play and is largely dependent on the context in which the skills are performed (Breed & Spittle, (2011). Therefore, developing motor skills in isolation "fails to account for the contextual nature of games in which players constantly interpret and adapt to a dynamic physical environment" (Light, 2003, p. 116). Cushion, Jones and Armour (2003) maintain that TCAs are unable to develop the competencies of independent and critical thinking skills in sports performance. These points are closely related to assertions in the literature in connection to GCAs and development in the cognitive domain. Claims that GCAs, such as Game Sense, have the capacity to improve a player's decision making and problem-solving abilities are evident in the literature. For instance, Light (2003) has suggested that Game Sense offers "a useful means of improving the cognitive dimension of play without detracting from skill development" (Light, 2003, p. 117). Similarly, Metzler (2011) has submitted that GCAs can "develop tactical awareness and decision making abilities when those become the primary objectives of instruction" (p. 362).

It has been proposed, however, that a diverse emphasis on a particular approach may produce different outcomes (McPherson, 1991). An overemphasis on developing motor skills might produce tennis players who are capable of rallying the ball in the absence of applying any form of game strategy. Equally, an excessive emphasis on developing strategies during game-play may result in players knowing what to do during game-play but who lack the motor skills to effectively perform the shot (McPherson, 1991). Therefore, "the debate is ultimately not an either-or question … both types of instruction are important. However, the timing of the introduction of skill and strategy instruction may have an impact on performance" (McPherson, 1991, p. 27). Similarly, effective coaching requires the acknowledgement that both motor skills and knowledge of the game provide a foundation for sound performance during game-play (Turner, Allison & Pissanos, 2001). Nonetheless, some research has claimed that GCAs provide an alternative avenue to developing the cognitive features required for game-play without diminishing skill acquisition (McPherson, 1999; Turner & Martinek, 1999).

The focus of early research on GCA s was primarily concerned with a comparative analysis of technical and tactical approaches to teaching games (Oslin & Mitchell, 2006). These studies predominantly included: middle school students instructed by Physical Education teachers who were trained to use TGfU (Alison and Thorpe, 1997; Lawton, 1989; Turner and Martinek, 1992; 1999) or a TGM approach (Griffin, Oslin & Mitchell, 1995; Mitchell, Oslin & Griffin, 1995). These studies have commonly employed quasi-experimental designs whereby the knowledge of learners has been examined using knowledge tests and game-play has been assessed using protocols focusing on the control, decision making, and skill execution elements of performance. Participants in these research endeavours have frequently been appraised by component skill tests (Turner & Martinek, 1995). Considering the variability in research design, contexts, content delivery and validation procedures between the reviewed studies, Oslin and Mitchell (2006) determined that GCAs tend to

promote improvement in a number of areas. These included: improved skill execution within game-play (Turner & Martinek, 1999), improved decision making skills (Alison & Thorpe, 1997; Gabriele & Maxwell, 1995; Griffin et al., 1995; Mitchell et al., 1995) in addition to improved response selection and response execution (Turner & Martinek, 1999) and game involvement (Mitchell et al., 1995).

Although research has been conducted into the adeptness of GCAs compared with the *traditional* or TCAs, evidence of the authority of one concerning the development of motor skill acquisition are equivocal (Oslin & Mitchell, 2006). Similar inferences were determined in a review of GCAs to teaching and coaching literature since 2006 (Harvey & Jarrett, 2013). In this review, a number of comparative studies revealed no significant differences between technique-centred and game-centred treatment groups in the development of on-the-ball skill performance (Gray & Sproule, 2011; Gray, Sproule, & Morgan, 2009; Memmert & Konig, 2007; Tallir, Lenoir, Valcke & Musch, 2007). However, studies performed by Gray and Sproule (2011), Lee and Ward (2009) and Harvey, Cushion, Wegis and Massa-Gonzalez (2010) revealed that implementing GCAs improves players' off-the-ball movement.[2]

With regard to learning in the affective domain (i.e., emotion, fun, enjoyment), Oslin and Mitchell (2006) found that GCAs were considered to be more enjoyable, and learners reported elevated levels of motivation when participating in Physical Education lessons (Griffin et al., 1995). Similarly, research conducted by Thomas (1997, as cited in Pearson, Webb & McKeen, 2005), Light (2003) and Light and Georgakis (2005) repeatedly discovered that TGfU produced increased enjoyment and empowerment, greater engagement and improved physical activity levels in learners. Since 2006, there has been a noticeable increase in the volume of research that explores learning in the affective domain (Harvey & Jarrett, 2013). These initiatives have provided support to the claims that GCA s "can be more fun than doing drills and that students can be motivated when taught with these approaches" (Harvey & Jarrett, 2013, p. 14).

In summary, there appears to be a lack of support for the superiority of GCAs over TCAs for performance measures in a number of games. Literature has suggested numerous reasons for the inconclusive findings on the effectiveness of such a popular pedagogical approach to the instruction of games. Studies have differed depending on the game selected for analysis, the age of the participants, the length and nature of the intervention, the variables chosen for investigation, and how these variables were measured (Oslin & Mitchell, 2006).

[2] Off-the-ball movement refers to a player's movements when they are not in direct contact with or playing the ball.

2.7.4 Employing Game-Centred Approaches (GCAs)

Despite research indicating the benefits of employing GCAs, a number of challenges exist for coaches wishing to implement this approach effectively. The capacity to use GCAs demands significant pedagogical aptitude (Light & Georgakis, 2005). According to Forrest, Webb and Pearson (2006) those who employ the game-centred practices require:

> A broad perspective and deep understanding of games, an ability to develop and ask appropriate questions at the appropriate learning moment, the ability to determine and select appropriate game forms to develop game understanding and the selection of modified games that truly parallel the actual game. (p. 34)

In the absence of these skills teaching may be misinterpreted as merely game-play. Simply playing the game might be considered an enjoyable activity in itself, however, it is argued by some that this outcome engenders doubt in relation to the pedagogical value of the practice (Forrest et al., 2006). Furthermore, Piltz (2006) acknowledges that coaching and teaching are decidedly complex and the implementation of game-centred pedagogical principles in practice is a challenging prospect. Game-centred instructional practices are not necessarily a solution for the many challenges confronting the teaching and coaching of games and sport. In order to implement these instructional practices successfully, coaches require superior instructional skills and a profound understanding of the activities involved. Launder (2001) indicates that Play Practice:

> Can place far greater demands on instructors than traditional methods of games instruction. To accurately observe and analyse play, and then to select, modify, condition or even create a progressive series of play practices for students, requires a very clear understanding of the fundamental nature of the activity as well as good instructional skills. (p. 52)

Additional challenges associated with GCAs relate to the aesthetics of teaching and coaching sessions. GCAs can often appear chaotic when compared to the ordered formation of drills that commonly epitomise TCAs. According to Light (2013):

> Most people's idea of a good training session or games class is one that looks well organised and in which the coach/teacher directs proceedings with authority. The problem with this is that nice neat-looking drills are far removed from the chaos or real matches and this is one reason why they don't work. (Light, 2013, p. 56)

Furthermore, Launder (2001) claims that "a sport educator needs confidence and patience to accept this apparent chaos as normal for beginners learning to play complex games and to work patiently toward improvement" (p. 52). Although GCAs have been presented as preferred alternatives to TCAs, none have an empirically founded theoretical framework. Most of these approaches have:

> Evolved through a process of reflective tinkering in which ideas have been generated, trialled, discarded, accepted or improved on. In both cases the process has been driven by a need to find better ways of inducing young people to make sport an integral part of their lives. (Launder, 2001, p. 16)

Yet, it is suggested that isolated skill drills are characterised by practising, the "same skill over and over with little adaption required" (Breed & Spittle, 2011, p. 56). It is argued that this training format fails to replicate the conditions of the actual game. According to the specificity of practice hypothesis, the most effective practice conditions resemble closely the target skill and target context (Schmidt & Wrisberg, 2008). In this way, skills are taught in conjunction "with decision making and anticipation of what is happening in the game" Breed & Spittle, 2011, p. 9). This form of training increases decision making via recognising patterns of play and movement cues during game play (Breed, 2010).

2.7.5 Direct instruction

TCAs have commonly been associated with the teacher or coach dominating the decisions regarding the *how*, *why* and *what* of student learning. This form of teacher or coach behaviour has been labelled direct instruction. The terms direct instruction and technique-centred are often employed synonymously in the literature. TCAs are commonly associated with prominent levels of direct or explicit instruction and feedback (Williams & Hodges, 2005). Positive and corrective forms of feedback are preferred in direct instruction. Positive feedback "serves the dual purpose of reinforcing correct learning trials and giving the learner motivation to maintain task engagement" (Metzler, 2011, p. 178). Corrective feedback is provided when the player makes an error. In this case, the coach indicates to the player that an error has occurred, and then informs the player how to correct the mistake (Metzler, 2011). The role of the teacher or coach is to usually explain, demonstrate, organise and conduct the lesson in addition to providing feedback. This form of teacher or coach behaviour has been labelled direct instruction. Direct instruction implies a "highly structured, teacher-centered and controlled instructional environment" (Byra, 2006, p. 452). According to Metzler, (2011), "there was a distinct "method" of teaching Physical Education that was dominant from around 1890 well into 1970 … the direct method, characterised by the "teacher saying" and the "student doing" (p. 173). Quay (2009) believes that this type of instruction positions the learner as "a "blank slate", a "vessel to fill", or a "duck to stuff"" (p. 136). Rink (2013) contends that: "highly active teaching, focused learning, and student accountability are inherent in the idea of direct instruction" (p. 152). Educators who implement direct instruction commonly perform the following:

- Break down skills into manageable, success-oriented parts.
- Clearly describe and demonstrate exactly what the learner is supposed to do.
- Design structured tasks for students to practice what is to be learned.
- Hold students accountable for the tasks they present through active teaching and specific feedback.
- Evaluate students and their own teaching on what the student has learned. (Rink, 2013, p. 152)

Other terms that have been used to describe comparable pedagogical principles include: command, formal explicit, teacher-centred and prescriptive (Metzler, 2011; Rink, 2013). According to Breed and Spittle (2011) explicit learning "takes place when skills are learnt through direct instruction on how to perform a task. Explicit learning is often associated with traditional teaching and coaching approaches where verbal instruction on specific technical skills is used" (p. 19).

The implementation of direct instruction present beneficial outcomes in a number of ways (Bailey & Macfadyen, 2007). Direct instruction is associated with the explicit transmission of information from coach to player and has drawn significant research support as a process for the effective development of motor skills (Gustart & Sprigings, 1989; Werner & Rink, 1989; French, Rink, Rikard, Lynn & Werner, 1991; Housner, 1990; Silverman, 1991). Rink (2013), suggests that direct instruction is judged the most effective way to teach when "content has a hierarchical structure and is primarily basic-skill oriented and when efficiency of learning is a concern" (p. 153). Direct instruction can also be employed to organise a "whole-class warm-up, to act as a motivational tool and set the tone for a lesson" (Bailey & Macfadyen, 2007, p. 40). It can also assist in keeping "the lesson tight so the teacher can concentrate on his strengths, and not be exposed by a lack of experience" (Bailey & Macfadyen, 2007, p. 41). Furthermore, it is suggested that direct instruction, is effective in "initiating pupils into purposeful activity, giving them an initial structured framework of 'security' from which the lesson can gain impetus" (Bailey & Macfadyen, 2007, p. 41). Many students rely on the coach or teacher for guidance, and in many cases their presence can offer the physical and mental encouragement that students require when they are expected to attempt a skill perceived as dangerous (e.g., certain gymnastic activities). Moreover, it might be considered unwise for students to develop bad habits by practising the incorrect way, especially where safety is an issue. It is considered by some that direct instruction maximises a coach's ability to maintain a safe environment, as they possess a greater degree of control of what occurs during the session (Bailey & Macfadyen, 2007). Direct instruction is considered by some as the most efficient way to deliver a large amount of information in a limited amount of time and it may assist teachers and coaches to "effectively control large classes, whose unwieldy size can be discomforting" (Bailey & Macfadyen, 2007, p. 41). Rink (2013) has commented that many students are proficient at copying what they observe. In this way, direct instruction could be considered a valid way of developing physical performance where players replicate skills, based on the teaching points determined by the coach.

Certain reservations in connection to the employment of direct instruction and its value to performance and learning, however, have been raised. Some research has suggested that direct instruction is "unidimensional as it assumes that the only important educational goal is to increase measurable student achievement [motor skill achievement] and that all students learn the same way and thus should be taught in the same way" (Peterson, 1979, p. 66). More recently, Morgan (2008) has submitted that direct instruction primarily focuses on developing the physical domain to the exclusion of the cognitive and affective learning domains. Byra (2006) suggests that learning in Physical Education is multidimensional in that it requires learning associated with the psychomotor, cognitive, and affective domains. It has also been suggested that direct instruction fosters skills that are tenuous and lack durability to psychological stress in comparison with indirect instruction (Abrams & Reber, 1988; Masters, 1992). Some have also claimed that direct

instruction may impede cognitive development in that that it marginalises the necessity of involving students in the learning process (Hellison & Templin, 1991; Masters, 2008). It is further maintained that limitations associated with direct instruction are evident when the learning outcomes "are aimed at the creation of new ideas and movements, pupil analysis of performance, and personal and social development" (Macfadyen, 2007, p. 43). In some instances, this form of instruction affords students limited opportunity to plan and evaluate performances (Macfadyen, 2007). Generally, critics of direct instruction argue that it is "restricting rather than liberating, and can impair the ability to retain and transfer information" (Macfadyen, 2007, p. 41).

2.7.6 Indirect instruction

As GCAs claim to accentuate the development of decision making skills and advocate the learner participating in tactical problem-solving, the decisions regarding the *how*, *why* and *what* of student learning are shared with the teacher or coach. Indirect is the term that is most commonly associated with this behaviour. The terms indirect and game-centred are frequently used interchangeably in the literature. Compared with TCAs, where the coach has control over the decision making during activities, GCAs "advocate the use of problem-solving to position students in the role of decision-maker" (Oslin & Mitchell, 2009, p. 633). According to Cuban (1990) the acquisition of knowledge in indirect instruction is "discovered by the learner, who is "rich clay in the hands of an artist" or a flourishing garden in need of a masterful cultivator" (pp. 3-4).

As direct instruction may not always be appropriate in all teaching settings, the employment of indirect instruction provides an alternative (Bailey & Macfadyen, 2007). Other terms such as: student-centred, implicit, inquiry, discovery and guided discovery have been used to describe similar pedagogical concepts. Breed and Spittle (2011) indicate that implicit learning occurs when:

> Skills are learnt through undertaking practice tasks, but without direct instruction on how to complete those tasks. Implicit learning approaches generally involve coaches or teachers facilitating or guiding players to explore options through techniques such as questioning. (p. 19)

Indirect instruction normally involves one or more of the following notions:

- Content is presented more holistically. Instead of breaking down what is to be learned into many subskills, chunks of content more meaningful to the learner are used.
- The student's role in the process of learning is usually expanded so that student thinking, feeling, or interaction skills are built into learning experiences designed by the teacher.
- The individual nature of student abilities, interests, and needs receives more consideration. (Rink, 2013, p. 152)

When the objective of the lesson is to activate student learning in the cognitive (decision making) and affective (enjoyment and motivation) domains, indirect

instruction has been considered the preferred practice. A major assumption of indirect instruction is that it offers more opportunity for learners to make decisions and be more involved in their own learning. It is also claimed that students will be engaged actively and creatively in a way that will lead to a more effective movement response that is adaptable and transferable to the sporting context (Rink, 2013). Indirect instruction regards the coach as a facilitator with control of the learning process being shared between the learner and the teacher or coach. Students are encouraged to problem-solve and explore solutions to various movement challenges.

Some research has asserted that students "only really understand if they are cognitively involved in learning a skill" (Anderson, 1999, p. 43). Similarly, Keighley (1993) has indicated that, "physical activity does not guarantee mental activity and it is mental activity which produces learning" (p. 32). While it is acknowledged, however, that some direct forms of instruction do impose cognitive demands on students, it is not usually the primary focus of the learning outcome (Bailey & Macfadyen, 2007). Capel, Kelly and Whitehead (1997), submit that teachers and coaches should "adopt teaching strategies that actively involve pupils in their own learning" (p. 108). Anderson (1999) has advocated that students should be provided with "the mental tools to systematically manage the thought processes associated with skill acquisition" (p. 45). According to Bailey and Macfadyen (2007), this suggests at "a much wider brief then knowledge reproduction" (p. 43).

It is claimed that indirect instruction positions an emphasis on the cognitive domain, motivates student involvement and stimulates students' imaginations in the learning process (Bailey & Macfadyen, 2007). Indirect instruction also tends to promote the employment of questions that are concerned with logic and judgement. Bailey and Macfadyen further suggest that the execution of the motor skill is improved through exploration that affords a "richness and wholeness to the learning experience" (p. 44). Indirect instruction empowers students and provides a sense of ownership in the lesson by providing students with a more profound responsibility for learning. According to Rink (2013), however, simply participating in an experience that has the possibility of making a decisive contribution to the affective and cognitive learning domains does not guarantee that these outcomes will be realised. Learning experiences must be explicitly designed and established to achieve specific goals. Research has shown, however, that students are increasingly motivated by tasks that are meaningful, interesting and enjoyable. More importantly, however, students are motivated by success (Oslin & Mitchell, 2006; Harvey & Jarrett, 2014).

Detractors of indirect instruction maintain that too much time is expended on thinking and discussing an activity than performing it (Bailey & Macfadyen, 2007). It is also claimed that if indirect forms of instruction are not planned and controlled, lessons can "easily drift, causing time to be wasted, and if work set is too broad, and virtually any pupil response will answer the question, standards of work can be low since students are insufficiently challenged" (Williams, 1993, p. 65). It is also asserted that students must possess the requisite level of maturity to understand their own limitations in the event of unsuccessful attempts and outcomes. (Bailey & Macfadyen, 2007).

2.7.7 Direct or indirect instruction?

Rink (1999) suggests that the issue between employing direct and indirect instruction when teaching or coaching and the theories of learning they are associated with relate to:

> The nature of cognitive processing essential for learning; the appropriate size of the 'chunk' of content presented to the learner; the amount of information the learner needs on that chunk of content; and the learning environment that best facilitates this process. (p. 153)

It is these issues that have had a propensity to be the focus of discussion on the best way to instruct. All forms of instruction acknowledge the requirement for significant levels of involvement with the content by the learner. The exact level of cognitive processing required to learn, and whether learning actually requires cognitive processing to be at a conscious level, is less agreeable.

Constructivism, which is a learning theory based on the view that we 'shape meaning', supports a high level of cognitive processing known as higher order thinking (Anderson, Reder & Simon, 1996). Alternatively, behaviourism is a learning theory that is less concerned with the level of cognitive processing and more interested in the learner's response. The leading focus for proponents of this theory is prompting an appropriate response from the learner and then reinforcing this response. The process employed to generate this response is not considered decisive. While both theoretical orientations to learning do not attend to the issue of conscious processing, this very notion is entrenched in the pedagogy of constructivism and behaviourism.

The synonyms for direct (explicit) and indirect (implicit) instruction are terms employed in psychology literature to signify *conscious* and *unconscious* processing respectively (Rink, 1999). The notion that the learner does not necessarily have to consciously process what they are doing in order to generate an appropriate response resides in literature relating to dynamical systems and motor learning. The *system* will constantly select an appropriate response based on the constraints (Newell, 1986). The notion that learners can obtain knowledge about how to perform a motor skill without the capacity to verbalise that knowledge has been explored by Magill (2007). Exactly how much knowledge learners require about motor skill responses has been of interest to motor behaviour theorists. Constructivism advocates that a larger and more meaningful *chunk* of content be offered to learners in comparison to behaviourism that promotes the breaking down of content into less than *wholes* (Anderson et al., 1996; Kirk and MacDonald, 1998). Within this learning theory, the learner is encouraged to "find their own way through tasks to promote higher levels of cognitive processing, rather than being given explicit detailed on how the task is to be accomplished" (Rink, 1999, p. 154). Alternatively, creating small progressive increments of content aimed at producing success focused learning is the pedagogy that reflects of behaviourism.

Perhaps the perspective here is that effective coaches employ both direct and indirect teaching styles – frequently within the same session (Rink, 2013). Direct and indirect teaching styles are notions that represent two ends of a continuum that

primarily determine who makes the decisions with regard to learning during coaching sessions (the player or the coach). According to Rink (2013) effective coaches "do not make a decision to operate at one end of the continuum or another based on beliefs about which method is better" (p. 154). Rink also suggests that diverse outcomes are expected to occur with each orientation.

The claims regarding the virtues of direct and indirect instruction must be considered in light of various impacting variables. These variables may include: the objectives of the coach, age of the player, skill level or stage of learning of the player, the size of the group being coached, motivation of the player and the complexity of the skill being learned (Bailey & MacFadyen, 2007). Similarly, Metzler (2011) has indicated that the decision to employ direct or indirect instruction is contingent on a number of factors. These factors incorporate: the coaching context and environment, learning outcomes in addition to players' developmental stage. In the case of intended learning outcomes, for example, two coaches may exhibit different learning outcomes for a particular coaching session. One of the coaches may wish to emphasise development in the players' decision making abilities, while another coach may want to focus on developing the players' techniques. Based on these outcomes, the employment of direct instruction may be appropriate for the coach attempting to develop technique through repetition and drills. In the other example, the coach who wishes to develop the players' decision making abilities via the use of questioning and permitting the player to explore various options may wish to implement indirect instruction (Metzler, 2011).

2.8 Theories of learning

The principles associated with GCAs and TCAs in addition to direct and indirect instruction are founded in learning theory. It has been suggested that the choice of instructional practices should be based on learning theory (Rink, 2001). Without a clear understanding of how learning occurs, coaches cannot expect to achieve their intended learning outcomes. Behavioural, information processing, cognitive strategy, and social learning models of learning have exacted most influence on instructional approaches in Physical Education, sport and motor skill acquisition (Rink, 1999). The conception of dynamical systems has been proposed, most recently, not as a model describing learning, but a model illuminating the factors impacting on the choice of a motor response (Magill, 2007; Newell, 1986).

Models of learning that support the concepts associated with behaviourism have largely shaped the governing view of learning for most of the twentieth century (Light, 2013). In spite of being mostly supplanted by constructivism in education programs, it "continues to have a strong influence in Physical Education" (Light, 2013, p. 27). Behaviourism highlights the significance of the external environment in determining behaviour. Coaches are guided to positively reinforce correct behaviour and progressively form behaviour to distinctly define correct performance outcomes. Incremental oriented models of learning stem from behavioural psychology (Bandura, 1969). The information processing model of learning focuses on the internal cognitive processes of the learner (Starkes & Allard, 1993). It is concerned with the way students select, apply, store, and understand information. A players' learning is like a "computer operation: students take information in, process it, and then practice" (Rukavina & Foxworth, 2009, p. 18).

Cognitive models have emphasised the importance of a holistic orientation to learning. Cognitive theorists have been interested in the strategies that students use to solve challenges, create, and learn (Anderson et al., 1996; Grehaigne & Godbout, 1995). Constructivism and conceptions of situated learning (Lave & Wenger, 1991) are contemporary theoretical orientations to teaching that are aligned with cognitive models of learning (Kirk & MacDonald, 1998). These models view the learner as an active participant in the learning process "who interacts with both a meaningful task and the learning environment to literally organize experiences and construct personal meaning" (Rink, 1999, p. 152). Constructivism emphasises "the nature of the content presented to the learner, the environment, and the role of the learner" (Rink, 1999, p. 152). As indicated earlier, presenting larger *chunks* of information and endeavouring to engage the learner in a high degree of processing are factors representative of pedagogy that is guided by behaviourism.

Social learning orientations highlight the significance of learning with others in a social setting (Vygotsky, 1978). Social learning theorists maintain that groups of learners create knowledge via interaction and collaboration. It is claimed that the creation or construction of knowledge differs from the acquisition of knowledge. Acquiring knowledge makes the presumption that knowledge exists and is there to be acquired by the learner in a cumulative manner. Social learning theorists believe that "what is constructed in a social interaction process is far different not only in terms of process but in terms of substance" (Rink, 1999, p. 152).

Experiential learning theory builds on social learning orientations as well as the conceptions linked to constructivism. This theory situates experience at the core of the learning process. Learning is about meaningful experiences that lead to a change in an individual's knowledge and behaviour. Extending upon earlier work by John Dewey and Kurt Levin, American David Kolb (1984) believes "learning is the process whereby knowledge is created through the transformation of experience (p. 38).

While not considered by some a learning theory, the dynamical systems theory (sometimes referred to as ecological, dynamic pattern, or action systems theories) (Breed & Spittle, 2011) has gathered interest in motor behaviour learning as an avenue to explaining how an "individual responds motorically to their environment" (Rink, 1999, p. 153). Dynamical systems propose that motor coordination patterns are "not the result of prescriptions for action but rather the interaction of organismic (physical strength), environmental (equipment size) and task constraints (what the student believes are the considerations of the task)" (Rink, 1999, p. 153). According to Rink (1999), "a motor response is not a selection but rather the result of constraining the system in particular ways" (p. 153). The role of the coach in the instructional practice of dynamical systems is one of manipulating the constraints to enable desired motor responses. These constraints are considered the boundaries that have an influence on the capabilities of movement (Clark, 1995; Newell, 1986) and consist of various aspects in the environment that may impact on learning (Araujo, Davids, Bennett, Button & Chapman, 2004; Coker, 2010). Physical environmental constraints, for instance, include: gravity, temperature, and wind. Social environmental constraints incorporate: spectators, peers or coaches watching and cultural norms (Breed & Spittle, 2011). Tasks constraints refer to the objective of an activity (hitting the tennis ball in a certain area), rules (number of serves

permitted) and equipment (court size, racquet size, compression level of the ball, and net height).

A constraints-led approach (sometimes called constraints-based approach) is another term that has commonly been employed to describe this orientation to learning (Renshaw, Chow, Davids & Hammond, 2010). This approach describes how constraints (physical, environmental and task) shape the acquisition of motor skills and knowledge of game-play (Araujo et al., 2004; Davids, Button, & Bennett, 2008; Renshaw et al., 2010). The player seeks a movement option to achieve a movement strategy to resolve the constraint(s) that are enforced (Davids, Araujo & Shuttleworth, 2005; Davids et al., 2008; Newell, 1991). According to Breed and Spittle (2011) the "movement solution will vary according to the constraints in the situation" (p. 16). With an emphasis on discovery learning, the constraints-led approach views the player as a problem solver (Coker, 2010). As the constraints change (i.e., physical, environmental and task) so to do the solutions for various movements (Davids, 2010).

Rink (2001) indicates that individual instructional practices are supported by learning theory with each theory describing learning from a different perspective. Magill (2007) posits that learning can take place through both implicit and explicit means. The ecological or dynamical perspective and the information-processing perspective are two theories that support motor-skill learning (Coker, 2010). The information-processing perspective focuses on individual functional constraints, for instance, how an individual processes either intrinsic or augmented information during motor skill acquisition and is most commonly used to provide insight into learning under direct instruction. With direct instruction, students receive information, process it, and then practice the skill. The teacher's main role is to provide content. The goal of the students is to receive the information from the teacher and then reproduce the motor pattern that the teacher suggested to assist them in becoming more skilful (Coker, 210). The information-processing perspective does not focus on the task and physical and sociocultural environment.

Direct instruction and technique-centred instructional practices are generally supported by behavioural and information processing explanations of learning. On the other hand, indirect instruction orientations and GCAs find their roots in learning theories related to cognitive strategies, constructivism and social learning. Dynamical systems also promote the use of indirect instruction.

2.9 Is there a *best* way to coach sport?

Literature has suggested that "there is no single theory of learning that would explain learning or lack of it in all situations, and therefore, there can be no single approach to instruction" (Rink, 2001, p. 163). Each theory of learning supports a particular approach to instruction, and therefore, each has "but a piece of a very complex phenomenon we call learning" (Rink, 2001, p. 123). An advantage of referring to learning theories is the ability to test the assumptions of the particular theory and determine what it means for players during coaching sessions. According to Rink (2001):

> You don't want to know simply that something works – you want to know why it works and how it works in different conditions. Knowing why it works and how it works allows you to develop pedagogy that is consistent with that why. (p. 123)

Moreover, understanding the theoretical conceptions that underpin teaching styles may alter the question that coaches commonly ask from "Which is best?" and "What do I believe?" to "What is happening here, and for what purposes, under what conditions, and what way should I use this instructional methodology?" (Rink, 2001, p. 123). There might not be a pre-eminent way to coach, however, there might be an optimal avenue to coach certain content to particular players (Rink, 2001). Like many recommendations with regard to choosing teaching styles to employ during coaching sessions, the critical issues converge on "for whom and under what conditions a particular pedagogy is appropriate" (Rink, 2001, p. 123). Having knowledge of a range of teaching styles permits the coach to serve these ideas. Challenges exist, however, in acquiring knowledge, expertise and experience to accurately implement teaching styles in an appropriate manner.

To impact on the learning experiences of players effectively, coaches are required to customise their instruction to the "specific learning readiness and interests of their students, by integrating concepts and implementing teaching strategies that are responsive to the students' diverse needs" (Whipp et al.,2012, p. 1). In connection to Physical Education, Graham (1995) suggested that while instruction would be simpler if all the students possessed matching interests, capabilities, and experiences, a *one program fits all* perspective fails to acknowledge the notion of differentiation. The concept of differentiation fosters the promotion of instructional content and behaviour specifically designed to cater to the individual needs and requirements of students (Graham, 1985; Tomlinson, 1985, 1999). Literature has suggested that the predominant objective of this educational concept is to present individual students with opportunities for optimal development (Gower, 2010; Hume, 2007; Kerry, 2004). According to Whipp and colleagues, "differentiated instruction is proactive. That is, if different students each have unique needs and skills, delivering a tailored and varied approach for the students is essential for effective teaching and quality learning" (p. 2).

Teachers and coaches have been encouraged to select teaching styles that harmonise with a number of considerations and the intent of their instruction. For instance, there may be occasions when coaches want players to achieve consistency with the execution of their motor responses. In these instances the coach might be more concerned with repetition, developing the capacity to produce a motor response, and individual learning than they are with more complex or socially constructed learning. In this case, the employment of more direct and prescriptive instructional guidelines may be most appropriate. Equally, there might be times when coaches wish to enhance the independent decision making ability of players, and include students in the processes involved in creating novel or flexible responses. In this situation, the implementation of a more *hands-off* approach typified by indirect instruction may be most suitable.

It has been reported that a large proportion of the research concerning instruction has been framed, not to determine theory nor to understand learning, but

to verify a connection between the instructional behaviour of coaches and what a player learns (Rink, 1999). A significant amount of this process-product research on teaching and coaching that occurred in the 1970s has formed the research base for direct instruction in addition to the research base pertaining to the instructional characteristics of coaches and teachers (Rink, 1999). As a result, much of the research completed within a process-product paradigm showed direct instruction to be valuable in creating learning with select content. Many of these early research initiatives advocating direct instruction focused on elementary maths and reading which is simple to "reduce to a small progressions and a step by step breakdown in content and explicit learning" (Rink, 1999, p. 164).

As the teaching of motor skills "lends itself well to the step by step explicit teaching, there is more than ample support for the teaching of motor skills using direct instruction" (Rink, 1999, p. 164). In spite of this, there is equal support for the view that reducing the coaching and learning of sport to performing motor skills may have a detrimental effect on "the manner in which students are able to use those motor responses in meaningful activity" (Rink, 1999, p. 164). The employment of instructional guidelines that serve to provide players with a capacity to execute motor skills in addition to apply these motor skills appropriately in contextual and meaningful settings encompasses a large portion of a coaches' challenge. A challenge, according to Rink (1999), "that is likely to involve the need for a variety of instructional processes" (p. 164).

2.10 Teaching styles and tennis coaching

Research to date that has explored the influence of instructional practices in the development of tennis-specific skills has largely been limited to examining performer's decision making and accuracy of response. For instance, Farrow and Abernathy (2002) assessed explicit and implicit instructional practices in the training of anticipatory skill for the return-of-serve of intermediate tennis players. The study revealed that the implicit group considerably enhanced their on-court response accuracy following the training intervention. No improvement was recorded for the participants in the explicit group. In another study conducted by Williams, Ward, Knowles, and Smeeton (2002), however, it was demonstrated that both explicit (prescriptive) and guided discovery processes were equally effective in enriching decision time and response accuracy. Smeeton, Williams, Hodges and Ward (2005) found similar results when comparing the influence of discovery, guided discovery and explicit (prescriptive) approaches on young, intermediate tennis players' anticipatory skill. Further results, however, showed that tennis players who were explicitly instructed displayed notably reduced response time when subjected to stress-provoking conditions compared to players in the discovery and guided discovery groups. This is consistent with research that has suggested that implicitly acquired motor skills are more resilient when trained in stressful situations (Masters, 1992, 2008; Hardy, Mullen & Jones, 1996).

The instructional practices of Australian tennis coaches have traditionally been characterised by technique-centred practices and direct instruction. Anecdotal claims in the literature have suggested that tennis practitioners prefer to highlight the development of technical skills associated with tennis prior to introducing the tactical

elements of the game (Reid, Crespo, Lay & Berry, 2006). These authors have additionally submitted that tennis coaches favour direct instruction whereby the coach dominates the decisions regarding the *how*, *why* and *what* of student learning. As a result of the tactical pedagogical discourse originating from Physical Education, many sport governing bodies have incorporated a more game-centred focus to coaching and coach education (Holt, Strean & Bengoecha, 2002).

The Australian Tennis Coaches Conference was one of many workshops that the co-creator of TGfU, Rod Thorpe, presented at in 1996. During this conference Thorpe outlined Game Sense and the associated learning assumptions and reported benefits. This pedagogical approach places all learning within modified games to emphasise understanding, tactical awareness, decision making and the development of contextualised skill. The employment of questioning to stimulate thinking rather than telling players what to do presents as a key instructional aspect (Light, 2004).

The influence of Game Sense prompted tennis coach education providers in Australia to promote and emphasise GCAs that embrace increased player involvement in the learning process in their formal accreditation coaching course learner guides (Crespo & Reid, 2009; Tennis Australia, 2010a, 2010b). The content of these learner guides regarding instructional practices are detailed in the following section.

2.11 The content of coach education accreditation manuals: International Tennis Federation (ITF)

The coach education learner guides developed for the JD and CP coach accreditation courses were largely based on the ITF coaching manual (Crespo & Reid, 2009). The ITF manual was developed as one of the resources for the education of coaches working with beginner and intermediate tennis players. The intention of the authors was to "include the necessary information that coaches need to know and be able to effectively implement in order to develop the adequate competences that will help them coach these players" (Crespo & Reid, 2009, p. 5). The resource was written by Dr. Miguel Crespo and Dr. Machar Reid with assistance and advice from ITF Coaches Commission members, the ITF Development Officers and the ITF Development Department staff. In developing this coach education resource the ITF encouraged other National sporting associations and organisations to "adapt the information presented to the needs of their coaches and players by expanding or summarizing its contents" (Crespo & Reid, 2009, p. 5). Subsequently, content from the ITF manual (Crespo & Reid, 2009 was duplicated in the Australian coach accreditation learner guides for the JD (Tennis Australia, 2010a) and CP coaches (Tennis Australia, 2010b). The outline of coaching processes now presented is referenced from the ITF coaching manual (Reid & Crespo, 2009).

The descriptions and interpretations of the terms used in both the ITF manual and the TA learner guides to describe the various instructional practices are those presented in these publications and reflect the interpretation of the authors. It is evident that some of these terms differ in definition, interpretation and usage from other literary sources. For instance, the ITF coaching manual (Reid & Crespo, 2009) uses the term, games for understanding approach to represent Bunker and Thorpe's (1984) Teaching Games for Understanding Approach (TGfU). This example provides one illustration of the variety of terms that have been adapted and used

interchangeably in the ITF manual and TA learner guides.

A total of four coaching approaches are identified in the ITF manual (Reid & Crespo, 2009). These entail: the teaching games for understanding approach (TGfU) or the Game-Based Approach (GBA); the action method; ecological and holistic approaches; and, dynamic systems approach. References to teaching styles are also presented as avenues for coaching practices. The terms employed in the ITF manual include: prescriptive, coach-centred, discovery and player-centred styles.

2.11.1 The Teaching Games for Understanding (TGfU) or the Game-Based Approach (GBA)

The ITF manual (Reid & Crespo, 2009) interprets the TGfU and GBA as a play/goal-oriented approach. In this method of learning, the player learns through playing the game and/or by match-simulated situations in training. The goal is to teach technique within the context of playing. According to the manual, the coach should isolate technique only when necessary and for as short as time possible. Technique is acquired as part of a whole development process and there will be times when the coach adjusts technique without the player being aware of it. To be successful, these approaches demand that coaches have a sound understanding of the game's technical as well as tactical characteristics. It has been suggested that tennis, more than any other game, illustrates the challenges of teaching games with a technique based approach. Despite three to four years of hard work, many beginners do not achieve a technical level that enables the *game* to be played with any sort of tactical appreciation. The technique that beginners may develop when carefully *fed* the ball, disappears as they *push* and *prod* the ball back in the game. Indeed, as compared to more traditional coaching approaches, the TGfU and GBA endeavour to emphasise the uniqueness of tennis by acknowledging that a decision making process precedes the technique employed. According to Crespo and Reid (2009) players that do not understand game tactics and struggle to select appropriate responses during game play.

2.11.2 The action method

This particular term is described in the ITF coaching manual as an "alternative to traditional tennis coaching practices, which commonly encourage beginners to copy the best players' movements" (Crespo & Reid, 2009, p. 56). The fundamental concepts associated with this practice include:

- Coaches possessing a sound understanding of how actions develop in tennis before assuming how to best teach them. That is, tennis actions have an internal logic, are invariably a function of intent or a particular motive, and are rarely performed in isolation. It follows that players should determine what they want to do before asking themselves how to do it.
- The process being proposed to involve the perceiving cues, moving, and then memorizing or adapting these experiences. Initially, the attention of beginners is focused on strategical/tactical considerations, which likely involve the perception of cues.
- Players being introduced to tennis through cooperative tactical games that

see them accumulating a greater number of game experiences and opportunities for repetition (i.e., long rallies).

- Frequently combine global (during which actions are practiced globally) and analytic (during which specific tactical or technical characteristics are learned or practiced teaching practices.
- The sequential or alternative use of command teaching, co-operative teaching (coach and players communicate and try to resolve problems together) and open or autonomous teaching (players independently create their own experiences).
- Fun exercises or short games should be organized frequently. Similarly, it is necessary to plan periods without instructions during which players can express themselves freely. (Reid & Crespo, 2009, p. 183)

In providing a conclusion for these coaching approaches, the ITF (2009) manual states:

> Discovery approaches are not about ignoring technique; they simply place its teaching within the context of a game. In using these approaches and beyond providing an enjoyable and challenging stimulus to players, the main goals of coaches become to teach players the game using a tactical approach and to introduce suitable technique to enhance performance when appropriate. Coaches increasingly understand that players want to play and that technique is only relevant within the context of helping individual players play better tennis. (Crespo & Reid, 2009, p. 183)

2.11.3 The ecological and holistic approaches

The ecological approach to sports coaching highlights the necessity of interacting systems that define a particular environment. Players are understood to "be both shaped and the shapers of this environment, where learning is seen as a reciprocal relationship between players and their environment, the environment provides resources and opportunities for players, while players gain information from and act in the environment" (Crespo & Reid, 2009, p. 183). Ecological approaches share congruent features to holistic approaches in a way that they both indicate that is it is "relatively more important to look at entire systems than to partition them and evaluate their component parts" (Crespo & Reid, 2009, p. 183). Holistic coaching considers the importance of developing players as a whole by using individual, comprehensive, multifaceted and personal programs. Coaches are again seen as facilitators of players' performances. Crespo & Reid (2009) submit that "modern tennis training emphasises the value of integration vs. isolation" (p. 183). Integrated or total training refers to a global vision of tennis player development that sees the traditional distinction between technique, tactics, conditioning, and psychology as being more artificial than it is real. When developing the technical aspect of a player's tennis strokes, there is a simultaneous development of some decision making, physical fitness and/or mental capacity. Crespo and Reid also suggest that "this interrelation is common to most highly directed, specific on-court work (i.e., regardless of primary goal)" (p. 183). Ecological task analysis is designed to provide strategies for individualising instruction, providing players with greater choice, to

enhance decision making, to increase coach observation, and to foster discovery. In keeping with “these types of models, it is agreed that there is no one best way to execute a particular motor skill; rather, movement from and outcomes are determined by goals, context, and individual constraints that continually change” (Reid & Crespo, 2009, p. 184).

2.11.4 The dynamic systems approach

The ITF coaching manual describes dynamic systems as an approach to understanding the behaviour of complex systems. According to Crespo and Reid (2009):

> Complex systems including the human are not fully explained by an understanding of their component parts. They consist of a large number of mutually interacting parts, whose two most relevant features are nonlinearity and universality. (p. 184)

Nonlinear systems represent behaviour that is simply not the “sum of its parts or their own multiples” (Crespo & Reid, 2009, p. 184). Consistent with this coaching approach, tennis is defined as a game where the players try to achieve their own goals and/or minimise the chances of opponents doing likewise. Tennis performance is the result of this interaction as compared to the simple display of skills and abilities of the two parties.

2.11.5 Teaching styles

The ITF coaching manual (Crespo & Reid, 2009) also makes reference to teaching styles in outlining supplementary options for tennis coaches to employ during their coaching sessions. In this manual, teaching styles are defined as “a set of teaching strategies, instructional formats or general teaching patterns used by a coach” (Crespo & Reid, 2009, p. 177). More specifically, the ITF manual distinguishes between two coaching approaches including: “prescriptive or coach centered styles and discovery or player centered styles” (Crespo & Reid, 2009, p. 178). Prescriptive coaching styles:

> Belong to the stream of direct or explicit teaching, which place an emphasis on players learning the strokes of the game, often through repeating their component parts (i.e., repetitively rehearsing the technical characteristics of the skill), to accomplishing the objective of playing the game. (Crespo & Reid, 2009, p. 179)

Coaches, explain, demonstrate, organise and conduct the practice, all while eliciting feedback and correcting the player’s errors. The authors of the ITF manual (2009) insist that “these approaches consider coaches to possess all-encompassing knowledge, which needs to passed on directly (and often repeatedly) to the players” (Crespo & Reid, 2009, p. 179). While they state that the advantages of using these approaches are that they promote safety, discipline, efficient use of time and available resources, together with some technical conformity, the students are

afforded minimal opportunities to develop social, cognitive and interpersonal abilities.

The alternative to “prescriptive or coach centered styles” (Crespo & Reid, 2009, p. 180), are “discovery or player centered teaching styles” (Crespo & Reid, 2009, p. 180). These forms of instruction view coaches as assuming a “supportive role through the presentation of a situation (problem) and the potential introduction of cues or tools that players may use to facilitate resolution” (Crespo & Reid, 2009, p. 180). The notion presented here is that players are more likely to learn and then apply skills that have been successfully discovered rather than prescribed. Moreover, the social and personal benefits such as, independence and self-confidence, that can be maximised from “these approaches are commonly lauded, while their increased cognitive demands (as compared to prescriptive approaches) are often associated with the development of game sense” (Crespo & Reid, 2009, p. 180). This form of instruction attempts to empower players via a process of becoming “self-aware, connecting and learning, taking action, and contributing to their own learning” (Crespo & Reid, 2009, p. 180).

2.12 The content of coach education accreditation learner guides: Tennis Australia

As outlined previously the coach education learner guides employed in the formal coach accreditation courses offered by Tennis Australia (TA) (Tennis Australia, 2010a, 2010b) are largely based on the material and content from the ITF coaching manual (Crespo & Reid, 2009). Numerous individuals at TA contributed to the development of these learner guides. Despite this, there exist a number of additional terms, definitions and interpretations that have been included and adapted for the coaching courses conducted in Australia. The TA learner guides distinguish between three different coaching approaches. These entail: modern coaching approach or Game-Based Approach (GBA); traditional coaching approach; and, the holistic coaching approach. The guides also identify two teaching methods that are available for coaches to consider when implementing lessons. These include: command teaching method and discovery teaching method. In addition to these instructional practices, the TA learner guides also list two coaching styles, namely direct coaching style and discovery coaching style. Lastly, the guide outlines a constraints-based coaching approach or philosophy.

2.12.1 The traditional approach

According to the TA learner guides (Tennis Australia, 2010a, 2010b), this approach emphasises the technical breaking down of the individual skills (strokes) and movements in order to accomplish the objective of playing the game. The players are first taught how to hit the ball before playing the game.

2.12.2 The modern coaching approach

The TA learner guides for JD (Tennis Australia, 2010a) and CP (Tennis Australia, 2010b) tennis coaches describe the modern coaching approach as a “play/goal-oriented approach. In this method of learning, the player learns through playing the game and/or by match-simulated situations in training” (Tennis Australia,

2010, p. 49). The goal in this instructional practice is to teach technique within the context of playing whenever possible. It is viewed as crucial that the coach possesses a sound understanding of the technical fundamentals of stroke production to ensure that the player is executing the strokes correctly, with minimal breakdown/isolation work on technique, according to these fundamentals. The coach is encouraged to "isolate technique only when necessary and or a short as time as possible. Technique is acquired as part of a whole development process and there will be times when the coach adjusts technique without the player being aware of it" (Tennis Australia, 2010, p. 49). It is considered that this approach to coaching (GBA) is:

> Generally considered a preferred way of teaching young players. An emphasis should be placed on match play and simulated match training. It is recommended that isolated work on technique be kept to a minimum and when performed, be done so with the intent of incorporating it into simulated match training as soon as possible. (Tennis Australia, 2010, p. 49)

2.12.3 The holistic framework

According to the TA learner guides (Tennis Australia, 2010a, 2010b), the holistic framework was designed to encourage coaches to incorporate and integrate the features of the traditional coaching approach (teach technique first followed by tactics) and the modern coaching approach (teach tactics first followed by technique). In this way, the coach is directed not to distinguish an either/or conception, but rather to develop technique and tactics simultaneously during their coaching sessions. Within the holistic coaching framework there is an equal importance on the central areas of the sport and a coach should be readily assessing their ability to develop:

- Technical: develop the stroke fundamentals.
- Tactical: create tactical understanding of the game of tennis.
- Physical: create high level of physical activity for all participants.
- Psychological: create a positive and safe learning environment.
- Social: create an environment which encourages peer interaction. (Tennis Australia, 2010, p. 52)

In spite of employing a different term to the one described in the ITF coaching manual for developing beginner and intermediate players (teaching style), the TA learner guides outline additional recommendations for coaches to consider when instructing students. Although initially using the term coaching style, the TA learner guides also use the terms, direct coaching method and discovery coaching method when referring to coaching styles.

2.12.4 The direct coaching style

Consistent with the TA learner guides (Tennis Australia, 2010a, 2010b) the coach has a predominant role in explaining, demonstrating, organising and conducting the practice and provision of feedback and correcting the players in this process. The coach has the knowledge and the players have to react to the coaches proposals. The advantages of this "coaching method are that it ensures technical

conformity, safety, discipline and efficient use of time and available resources" (Tennis Australia, 2010a, 2010b, p. 54). The disadvantages include the lack of social, cognitive and personal development of the players. This process is defined as "clearly a traditional approach" (Tennis Australia, 2010a, 2010b, p. 54).

2.12.5 The discovery coaching style

The TA learner guides (Tennis Australia, 2010a, 2010b) explain that in the discovery coaching method:

> The player is the one who has the prominent role when using this approach. The coach has a supporting role in presenting a situation (problem) and introducing the cues or tools players may use to solve the situation or problem. (p. 55)

In this particular instructional practice the coach has the knowledge but the players have a "very active role" (Tennis Australia, 2010a, 2010b, p. 55).

2.12.6 The constraints-based coaching philosophy

The final coaching approach that is presented in the TA learner guides is the constraints-based coaching philosophy and appears to be a derivative of the constraints-led approach (sometimes referred to as the constraints-based approach) (Renshaw, Chow, Davids & Hammond, 2010). In this document a constraints-based coaching philosophy "ensures that when teaching skills the contextual nature of the skill is not lost" (Tennis Australia, 2010a, 2010b, p. 57). In this approach, the players predominantly learn skills through guided discovery with the coach manipulating the constraints of the task in such a way that both learning and performance improvements occur.

The information provided in TA's learner guides illustrate a vast array of instructional practices available for tennis coaches to employ during coaching sessions. It also reveals the presence of numerous terms that are used to describe these practices in addition to slight differences in how they are defined and interpreted. It is also evident that a game-centred approach coupled with involving the player in the learning process (i.e., indirect instruction) is the recommended instructional practices for tennis coaches.

2.13 Is there a *best way* to coach tennis?

So what is the *best* teaching style for developing tennis players? This question has prompted considerable debate among tennis coaching practitioners. Learning tennis is a measured procedure that involves realising the most appropriate movement patterns related to game situations. The challenges that tennis players encounter are comprehensive. They are required to learn which environmental cues are significant and which are redundant in order to selectively concentrate on the most pertinent information (Abernathy, 1987). Players need to choose tactics that will provide them with the optimal opportunity to win a point in addition to accurately coordinate movement patterns that will effectively accomplish these

selected tactics (Hopper & Kruisselbrink, 2002).

Many educational theorists believe that there is not one predominant teaching style (Rukavina & Foxworth, 2009). It is generally believed that coaches should select a teaching style that is based on the objectives that they wish to accomplish, the developmental characteristics and individual requirements of the learner, as well as the subject matter (Rukavina & Foxworth, 2009). The requirement for a teacher or coach to employ a range of teaching styles is embedded in the knowledge that, "(a) student population is diverse, (b) Physical Education involves objectives from the psychomotor, cognitive, and social learning domains, and (c) subject matter and context at times dictate the employment of a specific approach to instruction" (Byra, 2006, p. 447). Similarly, it is recommended that for effective learning to occur in sport, players should be exposed to planned activities that foster development in four central domains. These include: the physical (core techniques), social (interacting with others), cognitive (strategies, tactics and decision making) and affective (fun and enjoyment) (Kay, 2003).

Students acquire knowledge in a variety of ways, originate from various cultural backgrounds, and arrive in sport and Physical Education with diverse movement experiences and abilities. Provided with these factors, it has been suggested that using only one teaching style is limiting (Rukavina & Foxworth, 2009). Therefore, the importance of mastering a variety of teaching styles and possessing an eclectic range to implement would appear necessary.

The requirement for a tennis coach to employ a range of teaching styles is perhaps embedded in a number of considerations. To begin with, coaches must be prepared to cater for the diversity of learning needs, preferences and the developmental readiness of each student. Coaches must also exhibit a knowledge and understanding of teaching styles and how and when to employ them. In addition, tennis, like other sports, involves learning aims and objectives from the psychomotor, cognitive and affective domains. Furthermore, lesson content and the context (such as age and ability) in which subject matter is practised may warrant a particular teaching style. As diverse learning conditions and experiences are often created by employing different teaching styles, the necessity for coaches to understand and purposefully implement a variety of teaching styles to achieve learning outcomes would seem paramount.

Literature has suggested that teachers have a tendency to overestimate the frequency with which they report to using teaching styles, (Cothran et al., 2005; Mosston & Ashworth, 2008; SueSee, 2012). Good and Brophy (1997) observed:

> We have discussed behaviours that Physical Education teachers engage in without full awareness and noted that even when teachers are aware of their behaviour they may not realise its effects. We believe that teachers' lack of awareness about their behaviour or its effects lessens their effectiveness. (p. 35)

As mentioned previously, sports coaches may not always have the capacity to articulate their instructional practices (Launder, 2001). Many are guided by the teaching styles they were instructed with as players and may not recognise the potential limitations associated with their behaviour as coaches (Launder, 2001). In

an earlier section of this thesis, it was also suggested that the concepts, in connection with the various instructional practices available for tennis coaches to employ during their coaching sessions, have been confounded by the presence of various terms and coaching language. Many of the commonly used terms lack consistency or uniformity and are usually viewed as interchangeable. Some of these terms include: command style, traditional approach, game-based approach, game-centred approach, situational method, self-discovery style, student-centred approach, teacher-centred approach and discovery. Often their respective definitions are without conceptual agreement and exist within the individual perception of the tennis coach. This has arguably led to confusion and the absence of a definitive set of concepts and principles reflective of the tennis coaching process and effective practice within it. The lack of information regarding the practices and insights of Australian tennis coaches is arguably due to the theoretical and practical difficulty of comparing multiple teaching styles. Many of these conceptions are not linked to a common theoretical framework. The importance of coaches basing their practice on a conceptual model has been well documented in the literature (Lyle, 2002; Mosston & Ashworth, 2008). A conceptual model provides a general design and logical approach to teaching and learning. It offers clarity around the purpose and arrangement of activities that promote increased student interest, cooperation, and managerial effectiveness and more legitimate assessments of learning (Metzler, 2011; Mosston & Ashworth, 2008). In relation to the benefits of using a common conceptual model Lyle (2002) asserted:

> It is a necessary part of the development of a profession to have a (conceptual) model with which to demystify practice, to provide a common vocabulary, to form a basis for research and enquiry, to create a template for education and from which ideological approaches and individual value frameworks can fashion their contextual significance. There are many empirical questions that cannot be adequately framed as a consequence of the absence of such a [conceptual] model. (p. 22)

Although Lyle (2002) places a strong emphasis on an agreed and intelligible arrangement of ideologies with which to evaluate coaching he argues that they should not be seen as resulting in a limited perspective on coaching. Personal differences are not negated by a shared model, and significant variety exists in relation to the employment of strategies, styles, frameworks and approaches. Central to a conceptual model is the avenue to “describe, debate, compare and disseminate such differences” (Lyle, 2002, p. 22). It has been suggested that every field of scholarship requires a conceptual framework that provides accurate and consistent definitions and parameters (Goldberger, 1992). In the absence of consistency in terminology, “reliable communication, accurate implementation, and assessment of ideas are difficult if not impossible” (Mosston & Ashworth, 2008, p. 3). Furthermore, the inconsistent use and understanding of terminology creates confusion and leads to the misinterpretation of events that ultimately limits educational practice (Mosston & Ashworth, 2008). In the absence of a “broad professional system and/or a reliable theoretical foundation” (Mosston & Ashworth, 2008, p. 3) teachers are at risk of approaching their instructional practices from an idiosyncratic perspective. As this viewpoint consists of personal interpretations and biases, it may limit the educational practices of teachers (Mosston & Ashworth, 2008). These personal interpretations may also lead to a lack of conceptual consensus, consistency of definitions or

uniformity in relation to various pedagogical approaches.

A multitude of conceptual frameworks and pedagogical and instructional models have been produced for Physical Education and sporting environments that have assisted in describing and organising the teaching process. For instance, Metzler (2011) identified seven different models of skill instruction with "each model designed to promote certain types of student learning outcomes. No one model does it all" (p. 160). The models, which draw on existing or modified ones, identified by Metzler include: 1) Direct Instruction, 2) Co-operative Learning, 3) Inquiry Teaching, 4) Tactical Games, 5) Peer Teaching, 6) Sport Education, and 7) Personalised Systems. More recently, Metzler has proposed a curriculum model that describes a comprehensive school physical activity program entitled HOPE (Health Optimising Physical Education) (Metzler, McKenzie, van der Mars, Barrett-Williams & Ellis, 2013). The primary objective of the HOPE curriculum model is to assist students to "acquire knowledge and skills for lifelong participation in physical activity for optimal health benefits" (Metzler et al., 2013).

According to Metzler (2011) Joyce and Weil (1996) offered the first definition of an instructional model:

> Models for teaching are models for creating environments: they provide rough specifications which can be used to design and actualise learning environments. Models are composed of interdependent parts. Content, skills, instructional roles, social relationships, types of activities, physical facilities, and their use all add up to an environmental system whose parts interact with each other to constrain the behaviour of all participants, teachers as well as students. Different combinations of these elements create different environments eliciting different educational outcomes. (p. 25)

Pill (2014) however, suggests that the "inherent problem with a models-based notion of sport teaching is that it sets up competing constructions of PE … metaphorically, teachers are left to decide which model option to choose" (p. 55). Having to decide between models limits "flexibility and adaptability to the competencies and situated needs of students" (Pill, 2014, p. 55). Pill argues that rather than focusing on learning, the emphasis shifts to the teacher employing the model correctly. Furthermore, the various models proposed by Metzler (2011) "can make it appear that teaching games and sport is as simple as adopting the blueprint of the model" (Pill, 2014, p. 55).

The equal importance placed on developing decision making skills, in addition to motor skills and technique in Physical Education and sport has been widely recognised. In the UK, the National Curriculum Physical Education (NCPE), the National Association for Sport and Physical Education (NASP) in the US and the Queensland Physical Education Senior Syllabus (QSPES) all integrate outcomes in the three major learning domains. To achieve the anticipated learning aims and objectives in all three domains, which comprise the development of decision making as well as technical motor skills, teachers are required to implement a range of teaching styles during lessons. The emergence of greater student decision making and interactions between teacher and students as well as among students arguably transpired with the introduction of Mosston's *Spectrum of Teaching Styles* (in this

study referred to as *The Spectrum*) in 1966 (Mosston, 1966).

2.14 Mosston and Ashworth's *Spectrum of Teaching Styles*

The Spectrum (Mosston & Ashworth, 2008) is a universal and unifying theoretical teaching framework and described as:

> A comprehensive array of alternative teaching approaches, or as we call them teaching styles, from which to select. No teaching style is inherently better or worse than another. Rather each, because of the unique learning conditions it fosters, is either more or less appropriate given the purposes, the context in which it is presented, and the learners involved. (Goldberger, Ashworth & Byra, 2012, p. 268)

Although applicable to any subject matter area, *The Spectrum* was developed originally for use in teaching Physical Education (Goldberger et al., 2012). Any theory attempts to explain a phenomenon based on a set of principles. The phenomenon is teaching, and the organising principle is that teaching can be defined in terms of decision making" (Mosston & Ashworth, 2008, p. 10). A framework is defined as "a structure composed of parts fitted and joined together" (Mosston & Ashworth, 2008, p. 8). The term universal applies to something that is "applicable everywhere or in all cases" (Mosston & Ashworth, 2008, p. 8), and unifying is defined as "to make or become a single unit, as to unify conflicting theories" (Mosston & Ashworth, 2008, p. 8). Initially developed in the United States by the late Dr. Muska Mosston and after Mosston's death in 1994 was further refined by Prof. Ashworth, interest in *The Spectrum* (Mosston & Ashworth, 2008) has spread around the globe for almost half a century. *The Spectrum* (Mosston & Ashworth, 2008) provides teachers, learners, parents, school administrators, curriculum developers, researchers, and others interested in teaching and learning with a common framework of terminology and language. Rather than prescribing specific instructional practices, it was emphasised that "the beauty of the spectrum lay in its ability to awaken teachers to their potential for reaching more students than is possible with a less comprehensive approach to teaching" (Mosston, 1966, p. 6). Described at the time as "the most significant advance in the theory of Physical Education pedagogy in recent history" (Nixon & Locke, 1973, p. 1227), *The Spectrum* (Mosston & Ashworth, 2008) is not viewed as a collection of teaching techniques or approaches. It is a "framework of options in the relationships between teacher and students" (Mosston, 1992, p. 56).

The first edition of *Teaching Physical Education* (Mosston, 1966) distinguished eight teaching styles (there are now 11) and provided examples of how each style might be employed during Physical Education instruction. *Teaching Physical Education* (1966, 1981, 1986, 1994, 2002, 2008) is now in its fifth edition. The latest version of *The Spectrum* (Mosston & Ashworth, 2008) consists of 11 different teaching styles which are represented by the corresponding letters: Command Style-A, Practice Style-B, Reciprocal Style-C, Self-Check Style- D, Inclusion Style-E, Guided Discovery Style-F, Convergent Discovery Style-G, Divergent Discovery Style-H, Learner-Designed Individual Program Style-I, Learner Initiated Style-J, and Self-Teaching Style-K (Mosston & Ashworth, 2008) (**Figure 2.2**).

Figure 2.2: The 11 teaching styles on *The Spectrum* (Mosston & Ashworth, 2008).

The structure of *The Spectrum* (Mosston & Ashworth, 2008) is underpinned by the central premise that "teaching is governed by a single unifying process: decision making" (Mosston & Ashworth, 2008, p. 8). Every deliberate act of teaching is a result of a previous decision. For example:

> How we organize students; how we organize the subject matter; how we manage time, space, and equipment; how we interact with students; how we choose our verbal behaviour; how we construct the social-affective climate; and how we create and conduct all cognitive connections with the learners. (Mosston & Ashworth, 2008, p. 8)

Mosston organised these many possible decisions into three main sets that comprise the *Anatomy of any Style.* These sets are identified as: 1) *pre-impact set*, 2) *impact set*, and 3) *post-impact set*. The *pre-impact set* involves making decisions in relation to the planning of the teacher-learner interaction. The *impact set* relates to implementation of the decisions that occur during the teacher-learner face-to-face interaction. The *post-impact set* refers to assessment decisions that can occur at any point during the face-to-face interaction by either the teacher or the learner (Mosston & Ashworth, 2008) (**Figure 2.3**).

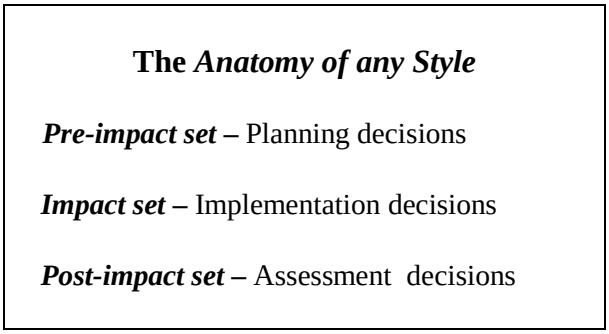

Figure 2.3: The *Anatomy of any Style* (Mosston & Ashworth, 2008).

It is possible for the teacher and the learner to formulate decisions in any of the decision sets that are defined in the *Anatomy of any Style*. When the majority of decisions in a decision set are being made by one decision maker (i.e., the learner), the decision making capacity of the learner is at *maximum* while the other person in the interaction (i.e., the teacher) is considered at *minimum* (Mosston & Ashworth, 2008, p. 9). By identifying who (i.e., the teacher or learner) makes which decisions, actual teaching styles emerge. For instance, if the teacher formulates all the decisions and the learner observes the teacher's determinations, the Command Style-A is created. In the Command Style-A, the teacher offers explicit instructions, including pace and rhythm for a given activity or endeavour. The learner conforms by executing the directives accurately to achieve an exact performance. This decision configuration produces opportunities to participate in a particular set of learning objectives. Subsequently, the organisation of decisions in each of the landmark teaching styles influences students in distinctive ways by designing situations for varied experiences related to human qualities "along the cognitive, social, physical, emotional, and moral Developmental Channels" (Mosston & Ashworth, 2008, p. 11). Each teaching experience affords the learner to share in and develop specific human qualities along one or many of the *Developmental Channels* (**Figure 2.4**). While one channel may, at times, be more prominent than another, all *Developmental Channels* function simultaneously. Each *Developmental Channel* embodies human characteristics. For instance, attributes located along the social *Developmental Channel* include: cooperation, communication skills, sharing and being courteous. In comparison, examples of human attributes along the cognitive *Developmental Channel* entail: comparing, sorting, categorising, interpreting and imagining (Mosston & Ashworth, 2008).

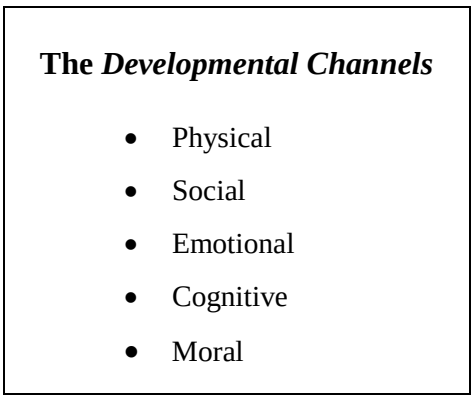

Figure 2.4: The *Developmental Channels* (Mosston & Ashworth, 2008).

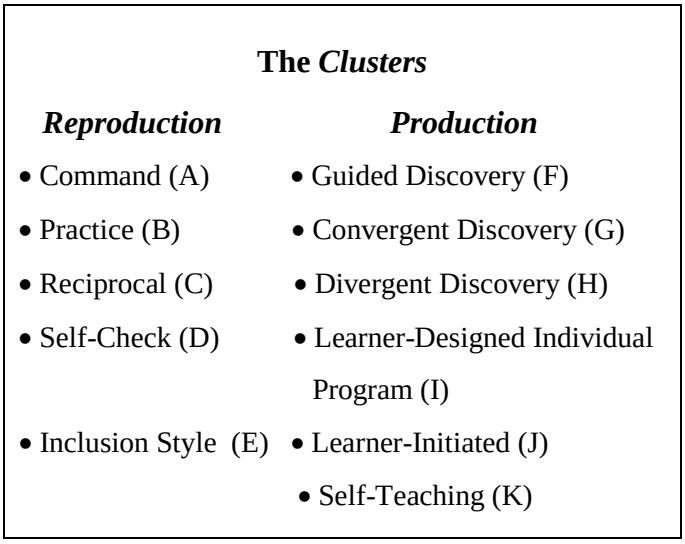

Figure 2.5: The *reproduction* and *production Clusters* on *The Spectrum* (Mosston & Ashworth, 2008).

Within the structure of *The Spectrum* (Mosston & Ashworth, 2008), two basic thinking capacities are reflected. These are: "the capacity for *reproduction* and the capacity for *production"* (Mosston & Ashworth, 2008, p. 9) (**Figure 2.5**). All individuals have, in varying degrees, the capacity to reproduce known knowledge, replicate models, recall information, and practice skills. Additionally, all individuals have the capacity to produce a range of new ideas. The first five landmark teaching styles (Command Style-A, Practice Style-B, Reciprocal Style-C, Self-Check Style-D, and Inclusion Style- E) form a *cluster* that represents teaching options that foster *reproduction* of existing (known, past) information and knowledge. The information to be learned can also be new to the learner but the content is fixed, specific, a model or procedure. The remaining landmark teaching styles (Guided Discovery Style-F, Convergent Discovery Style-G, Divergent Discovery Style-H, Learner-Designed Individual Program Style-I, Learner-Initiated Style-J, and Self-Teaching Style-K) form a *cluster* that represents options that invite *production* (discovery) of new knowledge. This knowledge is new to the learner, it may be new to the teacher, or at times, new to society (Mosston & Ashworth, 2008).

The defining characteristics of each of the five landmark teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) will be firstly presented. This will be followed by a description of the six landmark teaching styles located in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008).

2.14.1 The five landmark teaching styles of the *reproduction cluster*

Command Style-A

Achieving precision performance and reproducing a predicated response, practice or performance on cue following a set pace and rhythm are the defining characteristics of the Command Style-A. The teacher implements the maximum number of decisions while the learner makes the minimum number of decisions. All the decisions including, subject matter, location, posture, starting time, pace and

rhythm, stopping time, duration, and feedback are formulated by the teacher. The role of the learner in the Command Style-A is to reproduce a precision performance that imitates the cues and pace and rhythm that has been created for practising the content. The objective of this experience is for the learner to reproduce and perform the content in an exact and synchronised manner in a short amount of time so that the specific Command Style-A learning objectives can be accomplished. The Command Style-A is the first style from the *reproduction* cluster of teaching styles (Mosston & Ashworth, 2008).

Practice Style-B

The defining features of this style are individual and private practice of a memory/reproduction task with private feedback from the teacher. The role of the teacher in this style is to make all subject matter and logistical decisions in addition to providing private feedback to the learners. The learner's role is to individually and privately practice a task while deliberately making decisions that relate to nine elements associated with: where the task is be performed (location), order of tasks, starting time, pace and rhythm, stopping time, interval, initiating questions for clarification, attire and appearance, and posture. The developmental process of independence begins with the shifting of the nine decisions in Practice Style-B. These decisions include:

1. Location.
2. Order of tasks.
3. Starting time per task.
4. Pace and rhythm.
5. Stopping time per task.
6. Interval.
7. Initiating questions for clarification.
8. Attire and appearance.
9. Posture. (Mosston and Ashworth, 2008, p. 95)

Reciprocal Style-C

The delineating characteristics of the Reciprocal Style-C comprise the development of social interactions that employ the reciprocation of roles that emphasise the giving and receiving of immediate feedback that is directed by specific teacher prepared criteria (Mosston & Ashworth, 2008). The primary function of the teacher in the Reciprocal Style-C is to make all the decisions relating to content, criteria, and logistics as well as providing feedback to the observer. The role of the learner is to work in a partnership. In this partnership "one learner is the doer who performs the task, making the nine decisions of the Practice style, while the other learner is the observer who offers immediate and on-going feedback to the doer, using a criteria sheet designed by the teacher" (Mosston & Ashworth, 2008, p. 116). At the conclusion of the initial practice, the *doer* and the *observer* change roles. The Reciprocal Style-C permits the learner to continue along *The Spectrum* continuum (Mosston & Ashworth, 2008). The learner is now composing decisions regarding the ability of other learners to perform a skill when compared to a teacher engendered criteria sheet.

Self-Check Style-D

The defining features of the Self-Check-D style are “individual practice of a memory/reproduction task and engagement in self-assessment that is guided by specific teacher prepared criteria” (Mosston & Ashworth, 2008, p. 141). The role of the teacher in this teaching style is to compose all subject matter, criteria, and logistical decisions. The role of the learners is to “work independently and to check their own performances against the criteria prepared by the teacher” (Mosston & Ashworth, 2008, p. 141).

Inclusion Style-E

The purpose of Inclusion Style-E is for learners to participate in a task and learn to select an appropriate level of difficulty at which they can perform the task and to examine their performance. Entry level decisions and, if necessary, adjustment decisions and self-assessment decisions (guided by specific teacher prepared criteria) are shifted to learners. The role of the teacher in the Inclusion Style-E is to “make all subject matter decisions, including the possible levels in the task, and the logistical decisions” (Mosston & Ashworth, 2008, p. 156). The role of the learners is “to survey the available levels in the task, select an entry point, practice the task, if necessary make an adjustment in the task level, and check performance against the criteria” (Mosston & Ashworth, 2008, p. 156).

2.14.2 The six landmark teaching styles of the *production cluster*

The next six landmark teaching styles that will be discussed (Guided Discovery Style-F, Convergent Discovery Style-G, Divergent Discovery Style-H, Learner-Designed Individual Program Style-I, Learner-Initiated Style-J, and Self-Teaching Style-K) cross the *Discovery Threshold* and form a *cluster* that represents options that invite *production* (discovery) of new knowledge. The essentially artificial line of demarcation between the *reproduction* and *production clusters* is called the *Discovery Threshold*. The *Discovery Threshold* identifies the cognitive boundaries between each *cluster* (Mosston & Ashworth, 2008) (**Figure 2.6**).

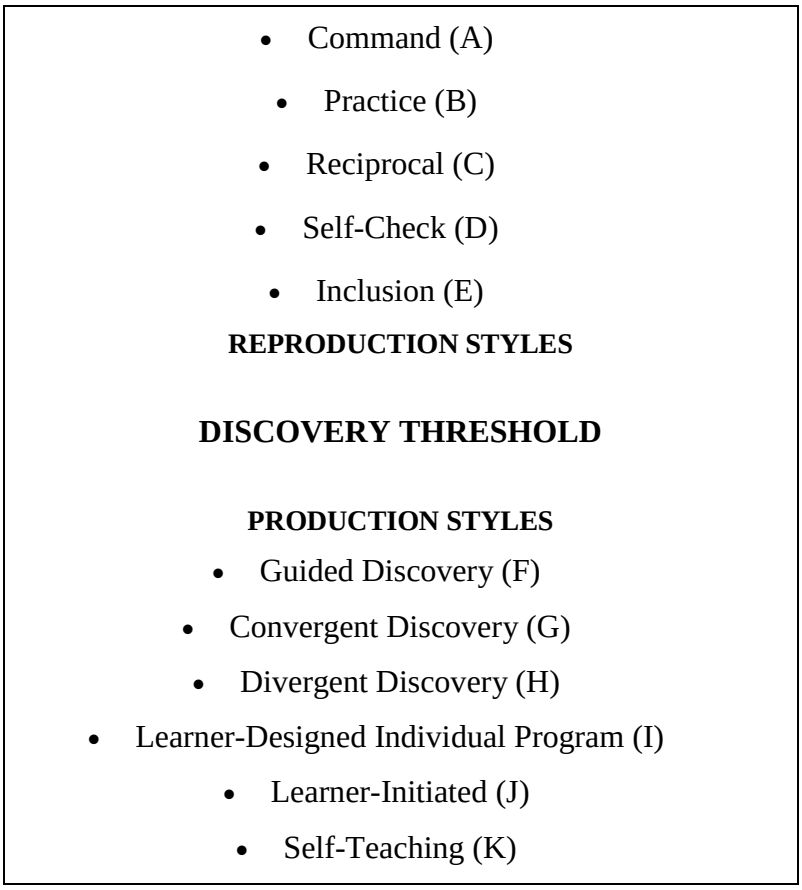

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Figure 2.6: The *Discovery Threshold* on *The Spectrum* (Mosston & Ashworth, 2008).

Guided Discovery Style-F

The first teaching style in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) that engages the learner in discovery is called Guided Discovery Style-F. According to Mosston and Ashworth (2008), the defining elements of the Guided Discovery Style-F is the "logical and sequential design of a series of questions that lead a person to discover a predetermined concept, principle relationship or rule that was not previously known" (p. 212). The essence of this style is a particular teacher-learner relationship in which the teacher's sequence of questions brings about a corresponding set of responses by the learner. This teaching style requires the teacher "to make all subject matter decisions, including the target concept to be discovered and the sequential design of the questions that lead to the target answer. The role of the learner is to discover the answers" (Mosston & Ashworth, 2008, p. 212). This infers that the learner makes decisions in relation to segments of the content. The process is sequential and invites the learner to make meaningful cognitive connections that lead to the discovery of new content, a concept, principle, relationship or idea (Mosston & Ashworth, 2008). If the learners already know the target concept, the objectives of this behaviour are nullified and the question and answer experience returns to a design variation of the Practice Style-B. Guided Discovery-F is considered the least understood style on *The Spectrum.* (Mosston & Ashworth, 2008). This may be due to the presence of similar terms being employed by other pedagogical approaches. For instance, Teaching Games for Understanding (TGfU) and its Australian derivative, Game Sense, employ the term

'guided discovery' when describing the role of the teacher. Subsequently, coaches and teachers may view Guided Discovery Style-F as comparable. In order to accurately employ Guided Discovery Style-F a deeper understanding is required.

Convergent Discovery Style-G

The defining characteristic of the Convergent Discovery Style-G is to produce the anticipated answer to a question not experienced before. A stimulus (in the form of a question, situation, problem to solve) is provided that invites re-organising of known information to produce new or novel cognitive links and patterns that rely on logic, and perhaps trial and error, to produce the anticipated target answer. If the learner has been exposed to the question-answer previously, then the teaching style and its objectives are no longer Convergent Discovery-G but Practice Style-B. The role of the teacher in this teaching style is to make all subject matter decisions, including the target concept to be discovered, and to design the single question delivered to the learner. The role of the learner is to engage in reasoning, questioning, and logic to sequentially make connections about the content to discover the answer. In the previous style (Guided Discovery Style-F), the teacher prepares the question and decides on the sequence in which they are asked. In the Convergent Discovery Style-G "the learner produces and arranges the logical sequence that ultimately leads to discovery of the anticipated response" (Mosston & Ashworth, 2008, p. 238).

Divergent Discovery Style-H

The defining quality of the Divergent Discovery Style-H is to "discover divergent (multiple) responses to a single question/situation, within a specific cognitive operation" (Mosston & Ashworth, 2008, p. 247). The role of the teacher in this style is to make decisions about the subject matter topic and the specific question(s) and logistics to be delivered to the learner. The role of the learner is to discover multiple solutions to a specific question. The Divergent Discovery Style-H is unique as "for the first time the learners are engaged in discovering and producing options within the subject matter" (Mosston & Ashworth, 2008, p. 248). In the previous styles, the teacher has determined the decisions regarding the particular tasks in the subject matter. Within certain parameters, the learners in Divergent Discovery Style-H "make the decisions about the specific production/configuration of the chosen subject matter. This behavior involves learners in the production of subject matter" (Mosston & Ashworth, 2008, p. 248). This style "invites learners to go beyond the known and to expand their boundaries of the subject matter" (Mosston & Ashworth, 2008, p. 248).

Learner Designed Individual Program Style-I

The Learner Designed Individual Program Style-I represents an additional step beyond the *Discovery Threshold*. In Guided Discovery Style-F, the specific response at each stage of the process was discovered by the learner. Their responses depended on the careful sequence of questions provided by the teacher. The Convergent Discovery Style-G required greater independence on the part of the

learner in the process of discovering the one correct answer. The dependence on the teacher decreased as the learner did not require a separate stimulus from the teacher at each step. In Divergent Discovery-H, the learner was even more independent in producing ideas. In Learner Designed Individual Program Style-I, the learner's independence becomes even more pronounced. The defining characteristic of this teaching style is the independence of each learner to investigate a broad problem, situation or issue and produce a workable, detailed program that resolves the specific content focus that each learner identified. In the Learner-Designed Individual Program Style-I, the role of the teacher is to make general subject matter logistical decisions for the learners. The role of the learner is to make decisions about how to investigate the general subject matter topic to produce questions that lead to a specific focus within the general topic, to produce questions that result in identifying the process and procedures, to discover the solutions/movements, and to designate the performance criteria.

Learner Initiated Style-J

The defining characteristic of the Learner-Initiated style is the learner's initiation, not the teacher's initiation, of the learning experience. An individual learner initiates a request to engage in this style and to design a full learning experience making all decisions, including the specific topic to investigate, planning and implementation decisions, and evaluation criteria. The student's role is to keep the teacher informed about the decisions made in the learning experience. In the Learner-Initiated style, the role of the learner is to independently initiate this behaviour and make all decisions in the *pre-impact*, including: which teaching-learning behaviours will be used in the *impact*, and create the criteria decisions for the *post-impact* (Mosston & Ashworth, 2008). Provided the teacher is qualified in the subject matter, the teacher's role is now to accept the learner's readiness to make maximum decisions in the learning experience, to be supportive, and to participate according to the learner's requests.

Self-Teaching Style-K

The defining characteristic of the Self-Teaching Style-K is individual tenacity and the desire to construct one's own learning experiences. This teaching-learning style does not exist in the school or classrooms. This style is governed by the individual's decision making expectations and desires. In the Self-Teaching Style-K, the individual participates in the roles of both teacher and learner and makes all decisions in the pre-impact, impact, and post-impact sets. When this behaviour is realised, the objectives that the individual has created in subject matter in addition to behaviour are achieved. This behaviour does not have an exact prescribed set of objectives. Rather, the individual selects the objectives.

2.15 The general structure of *The Spectrum*

One of the key aspects relating to the use of various teaching styles is matching the appropriate style to the intended learning outcome(s) of the lesson. Each teaching style has strengths and weaknesses that can render it more or less beneficial to pupil learning. As Mosston (1992) summarised:

> the fundamental issue in teaching is not which style is better or best, but rather which style is appropriate for reaching the objectives of a given episode. Every style has a place in the multiple realities of teaching and learning. (p. 28)

Furthermore, the capacity for *production* and *reproduction* should be viewed as complementary rather than mutually exclusive. For instance, after a learner has discovered how to apply spin to a forehand groundstroke in tennis (Convergent Discovery-G) a sufficient volume of repetition will be required to master the skill (Practice Style-B). A diagrammatical overview of the general structure of *The Spectrum* (Mosston & Ashworth, 2008) is provided in **Figure 2.7**.

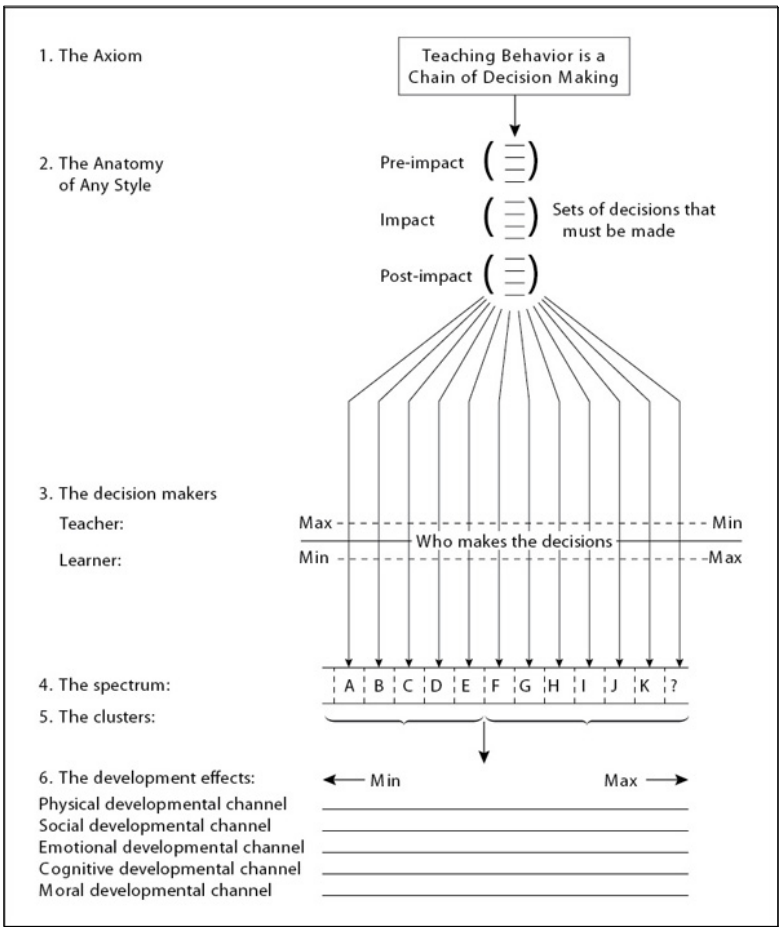

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Figure 2.7: The general structure of *The Spectrum* (Mosston & Ashworth, 2008).

2.16 Shifting decisions to create new teaching and learning episodes

2.16.1 Command Style-A to Practice Style-B

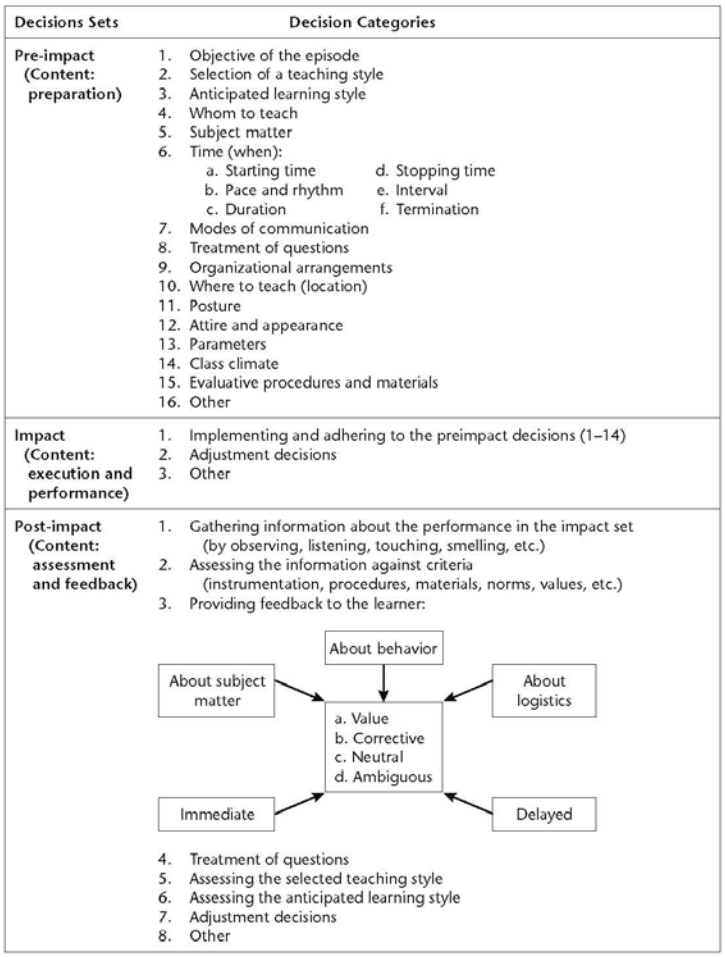
As previously mentioned, at one end of *The Spectrum* (Mosston & Ashworth, 2008) is Command Style-A which is defined by the teacher or coach making all the decisions and the learner responding in a synchronised and precise manner. Located at the other end of *The Spectrum* (Mosston & Ashworth, 2008) is a teaching style in which the learner makes all the decisions and the teacher or coach "serves as more of a resource" (Goldberger et al., 2012, p. 270). This teaching style is labelled Self-Teaching Style-K. A detailed outline of the specific decision sets and associated decision categories can be found in **Figure 2.8**. A practical example of this teaching style might be a tennis student who decides to participate in a self-developed practice routine based on knowledge acquired in a formal tennis coaching session. For instance, practising the tennis serve against a wall at the local park. According to Goldberger and others:

> These two end styles (where teacher makes all decisions [A] and learner makes all decisions [K] are definitive and universal. Between these bookend styles, Mosston thoughtfully and deliberately shifted the sets of decisions between teacher and learner to form different teaching styles. (p. 271)

A different and new teaching style is distinguished when a profoundly different teacher-learner relationship emerged. Practice Style-B was "revealed to Mosston when a particular set of decisions was shifted to the learner" (Goldberger et al., 2012, p. 271). This specific construction of decisions that shifts to the learner does not alter the episode's objective. The learner continues in their endeavour to copy the routine as provided by the teacher or coach. It does, however, "provide each learner with some personalized "wiggle room" or options about how this is accomplished (e.g., making the decision about pace/rhythm, starting time, posture)" (Goldberger et al., 2012, p. 271). The example provided in the following paragraph contrasts a Command Style-A teaching episode with a Practice Style-B teaching episode.

For the purpose of the example, an assumption is made that the grip for a tennis serve has been instructed by the coach in a step-by-step instructional manner using the Command Style-A teaching style. The precise position of the player's dominant hand holding the racquet is beginning to consolidate in the learner's motor memory. In an effort to buttress the skill the coach may stipulate this introductory Command Style-A episode with an additional Command Style-A teaching episode where the learner grips and re-grips the racquet five times, step-by-step, precisely following the coach's pace and rhythm to grip the racquet. This secondary Command Style-A teaching episode might then be followed by a Practice Style-B teaching episode whereby the player is requested to grip the racquet correctly a further ten times individually. In this teaching episode, the player moves to an area on their own and completes the ten practice trials at their own rhythm and pace. As a reminder for the player, the criteria for proper performance, or teaching cues, might be provided on a criteria sheet or task card that describes the key elements of the skill in addition to an illustration of the desired skill. This teaching episode may commence with the coach providing a review of the criteria, as well as a demonstration of the task, and

assuring the player that they will be delivering personal feedback. The specific decisions that were shifted from Command Style-A to Practice Style-B in the above examples encompass the following. Firstly, the learner made a 'location' decision when deciding where they would practice the given task. Secondly, the learner also made a set of 'time' decisions that included: 'starting' and 'stopping' time (i.e., when to start the task and when to conclude the task), 'pace' (i.e., how quickly or slowly they would complete the task), and 'time between each repetition' of the task (i.e., the player determined how long it would take to commence another repetition of the task). In summary, the task was provided by the coach, as was the criteria that described how the task was to be practised. The learner in this case, however, made a number of decisions with regard to location (i.e., where the task would be completed), and timing (i.e., when the task would commence, when the task would conclude and how long it took to commence another repetition of the task).



Decisions Sets	Decision Categories
Pre-impact (Content: preparation)	1. Objective of the episode 2. Selection of a teaching style 3. Anticipated learning style 4. Whom to teach 5. Subject matter 6. Time (when): a. Starting time d. Stopping time b. Pace and rhythm e. Interval c. Duration f. Termination 7. Modes of communication 8. Treatment of questions 9. Organizational arrangements 10. Where to teach (location) 11. Posture 12. Attire and appearance 13. Parameters 14. Class climate 15. Evaluative procedures and materials 16. Other
Impact (Content: execution and performance)	1. Implementing and adhering to the preimpact decisions (1–14) 2. Adjustment decisions 3. Other
Post-impact (Content: assessment and feedback)	1. Gathering information about the performance in the impact set (by observing, listening, touching, smelling, etc.) 2. Assessing the information against criteria (instrumentation, procedures, materials, norms, values, etc.) 3. Providing feedback to the learner: About behavior About subject matter About logistics a. Value b. Corrective c. Neutral d. Ambiguous Immediate Delayed 4. Treatment of questions 5. Assessing the selected teaching style 6. Assessing the anticipated learning style 7. Adjustment decisions 8. Other

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Figure 2.8: The decisions of the *Anatomy of any Style* (Mosston & Ashworth, 2008).

2.16.2 Practice Style-B to Reciprocal Style-C

The next teaching style located on *The Spectrum* (Mosston & Ashworth, 2008) is Reciprocal Style-C. An example will be now provided to illustrate the shifting of decisions between Practice Style-B and Reciprocal Style-C. In the shifting of decisions between Practice Style-B and Reciprocal Style-C, the "decision transfer occurs in the post-impact set of decisions" (Mosston & Ashworth, 2008, p. 271). In this case, a learner assesses another learner's performance (i.e., a partner). This is achieved through performance criteria that are provided by the coach. In this example we will use the learning of the tennis service swing. The performance criteria or task card that illustrates and describes the task is given to a partner. The partner then observes the performance of the other player and offers assessment based on the criteria that was provided by the coach on the task card. After one learner has completed the task they then alternate roles. Reciprocal Style-C is not limited to providing an avenue for offering feedback, as it also presents opportunities for "social development as the partners systematically "help" each other within a constructive relationship to learn the task at hand. Giving and accepting feedback are important social skills that can be learned and practiced" (Mosston & Ashworth, 2008, p. 271). While there might exist numerous references to behaviour that implies Reciprocal Style-C, the vast majority represent Practice Style-B with a partner relationship (Mosston & Ashworth, 2008). Many of these teaching episodes do not comprise teacher or coach criteria to guide observation, feedback or communication skills in a reciprocal relationship (Mosston & Ashworth, 2008). In Reciprocal Style-C "new dimensions evolve that go beyond the mere performance of the physical tasks, such as social interaction, giving, receiving, trying out ideas, correcting, and succeeding" (Mosston & Ashworth, 2008, p. 136).

2.17 O-T-L-O (Objectives, Teaching behaviour, Learning behaviour, and Outcomes)

The interface that exists between the teacher or coach and the learner always reflects a specific teaching behaviour, learning behaviour as well as particular sets of objectives that are achieved (Mosston & Ashworth, 2008). Each teaching style episode comprises its own "objectives, teaching and learning behaviour, and outcomes" (Goldberger et al., 2012). The term used to describe this entity is the O-T-L-O (Objectives, Teaching behaviour, Learning behaviour, and Outcomes) (Mosston & Ashworth, 2008). This relationship is shown in **Figure 2.9.** The Objectives (O-) represent the intent of the episode pertaining to content. The Teaching-Learning behaviour (T-L) outlines the interaction between the teacher and learner during the mastery of the content. The Outcome (O) relates to the extent the objectives were accomplished. These components are referred to as a "pedagogical unit" (Mosston & Ashworth, 2008, p. 15).

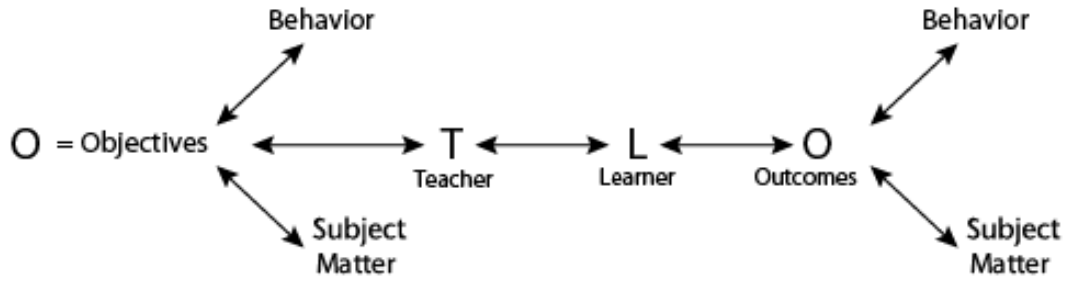

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Figure 2.9: The Pedagogical Unit: O-T-L-O (Mosston & Ashworth, 2008).

As discussed earlier, the teaching styles on each end of *The Spectrum* (Mosston & Ashworth, 2008) continuum are absolute. Mosston "identified the other teaching styles along this decision making continuum by gradually shifting decisions between teacher and learner until new styles emerged" (Mosston & Ashworth, 2008, p. 273). This occurred when a different coach or teacher-learner relationship and set of learning parameters arose. As previously mentioned, Mosston identified a "cluster of nine teacher decisions in the command style that, if shifted from teacher to learner, made enough of a change in learning conditions to be considered a different teaching style" (Mosston & Ashworth, 2008, p. 273). Goldberger and colleagues have suggested that some of the teaching styles that Mosston identified are not original, with many "being identified elsewhere in similar iterations" (p. 273). For instance, Command Style-A share similar pedagogical principles to those of direct instruction (Mallett, 2005; Metzler, 2011) and Interactive Teaching (Rink, 2010). Similarly, Reciprocal Style-C and Divergent Discovery-H, when implemented in small groups, correspond with Cooperative Learning (Dyson, 2002). When an arrangement of decision making does not replicate one of Mosston's 11 landmark teaching styles, these non-landmark teaching styles are referred to "as being under the canopy of the nearest landmark style" (Mosston & Ashworth, 2008, p. 274). Other terms that have been used synonymously to describe this conception include: canopy design(s), canopy style variations, canopy episodes, canopy experiences, canopy teaching and non-landmark teaching styles and variations/versions that may exist near, within or between any landmark teaching style (Ashworth, 2010; Mosston & Ashworth, 2008; Goldberger et al., 2012). For the purpose of clarity and consistency the term canopy design(s) (Mosston & Ashworth, 2008) will be used.

2.18 Canopy designs

An important factor that impacts the quality of teacher education in addition to research in the field of pedagogy is the capacity to identify and reliably differentiate one teaching style from another (Ashworth, 2010). As diverse learning experiences are shaped by instigating different teaching styles, it is vital that the information and skills required to differentiate various teaching styles be constant and dependable (Ashworth, 2010). *The Spectrum* (Mosston & Ashworth, 2008) is a continuum of teaching and learning possibilities. According to Ashworth (2010):

> This decision making continuum identifies LANDMARK TEACHING STYLES-each landmark style has a specific decision structure for the teacher and the learners; thus, each teaching style creates a corresponding (predicted, expected) set of learning objectives/outcomes. (p. 1)

Each of the landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008) function as indictors that represent considerably different teaching and learning experiences. Located between the teaching styles are many, if not an infinite number, of teaching and learning experiences called canopy designs (Ashworth, 2010) (**Figure 2.10**).

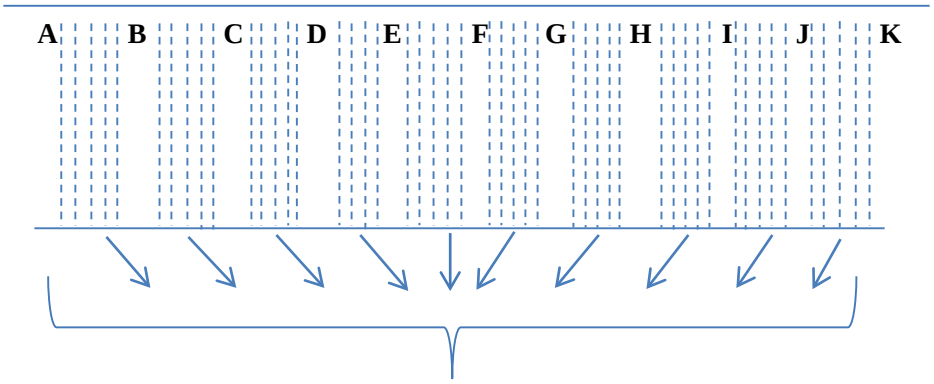

Figure 2.10: The infinite number of canopy designs between the 11 teaching styles.

Canopy designs are also delineated by a set of decisions that correspond with specific learning objectives. However, canopy designs do not promote significantly diverse decisions or learning objectives from the landmark teaching styles that they exist between (Ashworth, 2010). More accurately, canopy designs highlight in differing proportions a segment or combination of "the decisions, the learning objectives, and the developmental focus of the two landmark styles they are in between" (Ashworth, 2010, p. 2).

The notion of canopy designs was first referenced in the third edition of *Teaching Physical Education* (Mosston & Ashworth, 1986). The chapter in this edition titled, *Landmark Styles and the Canopy*, was brief and primarily served to "introduce the difference between landmark (all decisions shifted as described by the theory) and canopy (only a portion of the theory decisions shifted" (S. Ashworth, personal communication, July 2, 2012). The examples provided in the third edition included a canopy design between landmark teaching styles A and B that entailed attending a lecture and maintaining one's posture. As none of these examples solely represented a landmark teaching style, they were considered examples of a canopy design of either Command Style-A and Practice Style-B. Reference is additionally made to "educational terms that are ambiguous and do not represent a specific set of decisions and therefore could be designed in several teaching styles, for example, socialization, direct/indirect, individualizing instruction and teaching for thinking" (S. Ashworth, personal communication, July 2, 2012). The fifth (first online edition) of *Teaching Physical Education* (Mosston & Ashworth, 2008), provides further developments to the notion of canopy designs.

Canopy designs exist between and within all landmark teaching styles and are not considered less relevant or essential than the landmark teaching styles (Ashworth, 2010, 2004). For instance, canopy designs are employed to progressively direct learners to experience new decisions and learning encounters of the landmark teaching styles they reside between. Ashworth (2010) explains that when devising lessons or coaching sessions it is:

> Necessary to implement canopy episodes with a variety of developmental emphasis to attract and invite students with their diverse interests, to ensure internalization of the objectives and developmental focus, and to reinforce the application of different learning outcomes to a wide knowledge-base. (p. 2)

Adopting a multitude of decision making skills and objectives, including both landmark teaching styles and canopy designs, demands measured and frequent practice. Experience in various learning situations is the "foundational rationale for implementing alternative teaching and learning styles (approaches, methods, strategies etc.)" (Ashworth, 2010, p. 2). Landmark and canopy design teaching asserts that all teaching and learning encounters can be positioned along *The Spectrum* (Mosston & Ashworth, 2008) continuum. This location is not indiscriminate but rather governed by classifying the set of decisions and corresponding learning objectives that each experience innately encourages (Ashworth, 2010). The 11 landmark teaching styles located on *The Spectrum* (Mosston & Ashworth, 2008) define the:

> DEMARCATION from one EXCLUSIVE SET of teaching-learning experiences/approach to another significantly different EXCLUSIVE SET of teaching-learning experiences/approach. All non-landmark teaching events are canopy experiences that are located between landmark styles. (Ashworth, 2010, p. 2)

As teaching necessitates the purposeful organisation of experiences that realise precise learning outcomes, the ability to differentiate experiences that encompass landmark teaching styles and canopy designs is critical (S. Ashworth, personal communication, September 30, 2010). The importance of clarity in relation to "whether or not an episode is landmark or under the canopy of a style has to do with accountability" (Goldberger et al., 2012, p. 274). Common with quasi-scientific research, "clarity and precision are critical in understanding the Spectrum and its implications" (Goldberger et al., 2012, p. 274). Ashworth (2010) advocates that when "discussing, implementing, assessing or conducting research it is imperative that a correct distinction be made as to the identification of the observed teaching events-landmark or canopy" (p. 3). As canopy designs highlight and share approximate, but not precise, learning objectives, decision structures and the developmental focus of the landmark teaching style(s) that they are located near or between, they cannot be assessed or labelled as the exact same behaviour (S. Ashworth, personal communication, September 30, 2010). The labels assigned to canopy designs are determined according to the landmark style(s) they most support, the decision(s) that distinguish them from the landmark teaching style. The labels also highlight the central developmental focus that differs from the

landmark teaching style(s) (Ashworth, 2010). For instance, **Â+socialisation**[3] can be read as canopy design of Command Style-A plus socialisation. This labelling means that this particular teaching episode adheres to the decision structure of the landmark teaching style, Command Style-A (reproducing an anticipated response or performance on cue) while adding socialisation to the precision practice of the task (Ashworth, 2010). Canopy designs can be designed in all landmark teaching styles. Another example of a canopy design is **Ê-level choice**. This canopy is interpreted as canopy design of Inclusion Style-E minus level choice. The labelling means that the teaching episode adheres to the decision structure of the landmark teaching style Inclusion Style-E (learners with varying degrees of skill select a level of difficulty at which they can perform and practice individually) while removing the option of selecting the level of difficulty to be practised. In this case, the teacher selects the level of challenge for individual students to perform and practice. The examples provided serve to highlight only a diminutive portion of the infinite range of canopy designs that are possible.

Some canopy designs are labelled with a plus (+) and others with a minus (-). If the set of decisions move the experience towards the next landmark teaching style on the continuum it is assigned a plus (+). If, however, the set of decisions move the experience away from the landmark teaching style's set of decisions it is assigned a minus (-). In the first example provided above, the addition of socialisation moves the experience toward the next landmark teaching style, therefore a plus (+) is included in the label. In the second example, however, omitting the option of choice is a divergence from the landmark teaching style Inclusion Style-E's set of decisions, therefore a minus is incorporated in the label.

Canopy designs may additionally encompass the essence of two landmark teaching styles. For instance, canopy design **ÊB-level choice**. This labelling is interpreted as a canopy design of the Inclusion Style-E minus level choice and Practice Style-B. This canopy design suggests that despite the task being developed for inclusion (presenting numerous levels of challenge for each task from which the students choose), the teacher appoints the learners to the task level they are to individually practice (Practice Style-B) (Ashworth, 2010). By indicating the difference from the landmark teaching styles, it is possible to study the learning (behaviour and/or academic) influence of any and all teaching processes with greater accuracy (S. Ashworth, personal communication, September 9, 2011).

2.19 Refinements to *The Spectrum*

The first edition of *Teaching Physical Education* (Mosston,1966) introduced the pedagogical theory of *The Spectrum* (Mosston & Ashworth, 2008) that consisted of eight teaching styles (there are now 11) and provided examples of how each style might be employed during Physical Education. Mosston also provided a schema of *The Spectrum* (now significantly revised) (Mosston & Ashworth, 2008) that attempted to provide a diagrammatical overview (**Figure 2.11**). The diverging lines were designed to signify that "education should proceed from a dependent learner

[3] The symbol located above the letter is like an umbrella – a canopy over a larger area. The pole is the landmark teaching style and the distance from the pole to the edge of the canopy (umbrella) represents a range of options that are associated with, that represent, that carry, in varying degrees, the decision structure of the landmark teaching style. (S. Ashworth, personal communication, August 17, 2014)

toward the target of an independent learner (Goldberger et al., 2012).

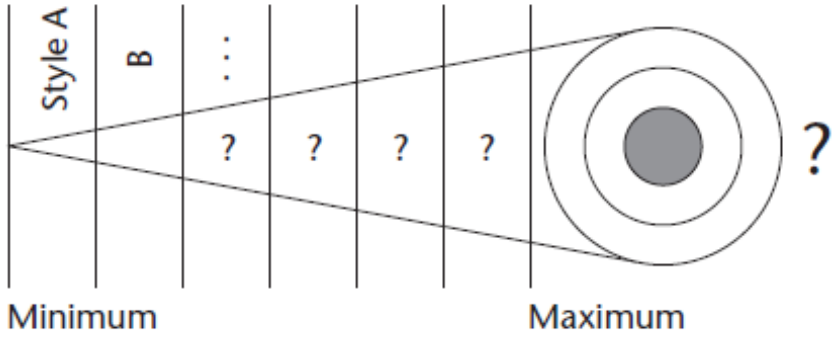

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Figure 2.11: The original diagram representation of *The Spectrum* (Mosston & Ashworth, 2008).

Mosston's seminal work is now in its fifth edition (Mosston, 1966; Mosston, 1981; Mosston & Ashworth, 1986; Mosston & Ashworth, 1994; Mosston & Ashworth, 2008 first online edition) and while the premise of *The Spectrum* (Mosston & Ashworth, 2008) has remained constant and the notion of "shifting decisions between teacher and learner to form different teaching styles has remained unchanged" (Goldberger et al., p. 2012), a number of refinements have been made. These refinements have developed, matured and materialised. Mosston, and later Mosston's long-time colleague and partner Prof. Sara Ashworth, as well as others, employed and examined *The Spectrum.* (Mosston & Ashworth, 2008). Some of these refinements will be now be presented and discussed.

One of the most significant refinements is perhaps the reformation of *The Spectrum* (Mosston & Ashworth, 2008) schema (**Figure 2.12**).

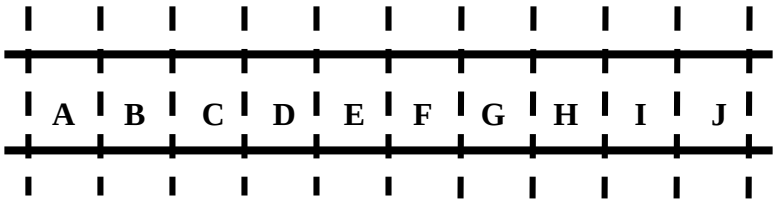

Figure 2.12: The current diagram representation of *The Spectrum* (Mosston & Ashworth, 2008).

Mosston illustrated this revised schema in the second edition of *Teaching Physical Education* (Mosston, 1981). The original cone-shaped diagram (**Figure 2.11**) embodied Mosston's attempts at the time to "move the profession from its predominant teaching style (the Command Style) to discovery teaching-learning experiences" (Mosston & Ashworth, 2008, p. 20). Mosston acknowledged that this cone-shaped diagram, however, was incompatible with the non-versus premise of *The Spectrum* (Mosston & Ashworth, 2008) that suggests "all behaviours contribute to educational objectives, and that no one behaviour is more important than any other" (Mosston & Ashworth, 2008, p. 20). Due to the two diverging lines that formed a cone-shape across the schema, it created the impression that the teaching styles on the left side of the continuum were smaller, and by association, of lesser

value than the teaching styles located to the right (**Figure 2.11**). Mosston viewed all teaching styles as complimentary to one another and in the Preface of the second edition of *Teaching Physical Education* (Mosston, 1981) he wrote: "the conceptual basis of the Spectrum rests on the NON-VERSUS notion. That is, each style has its place in reaching a specific set of objectives; hence, no style, by itself, is better or best" (Mosston, 1981, p. viii). To align Mosston's notions more closely to *The Spectrum* (Mosston & Ashworth, 2008) schema, the revised diagram **(Figure 2.12)** presents each individual teaching style with equitable dimensions. According to Ashworth (2008): "The Spectrum is now a continuum with equal spaces and dotted lines representing the incremental, yet cumulative, shift of decisions and the design variations that exist between landmark styles" (Mosston & Ashworth, 2008, p. 20).

Another important development from Mosston's first edition of *Teaching Physical Education* in 1966 to the definitive fifth edition (first online edition) in 2008 was "the precision with which decisions are analysed to distinguish one behaviour from another" (Mosston & Ashworth, 2008, p. 20). It was this precision in analysing decisions that resulted in the addition of new teaching-learning behaviours. As previously mentioned Mosston (1966), initially proposed eight teaching styles including: Command, Task, Reciprocal, Small Group, Individual Program, Guided Discovery and Problem Solving. At different stages, some of these teaching styles would be eliminated and some would be added, renamed and revised. For instance, Small Group Style was eliminated from the original list of teaching styles outlined in Mosston's book (1966). Mosston (1966) suggested that this teaching style was "very similar to that for the use of a partner, with the exception of additional roles for more than one observer and a recorder" (p. 95). Aside from this, the other decisions with regard to the style are identical to Reciprocal Style-C. Other teaching styles were renamed. The Individual Program would later be identified as Self-Check Style-D, while the Task Style was changed to Practice Style-B as "all styles have a task" (Mosston & Ashworth, 2008, p. 96). Other styles would experience significant revisions, such as was the case with the Problem Solving Style. The subsequent revision of this teaching style resulted in the design of two teaching styles that included: Convergent Discovery Style-G and Divergent Discovery Style-H. The Spectrum is now a dynamic system and continues to be refined and further developed by Prof. Sara Ashworth.

As outlined earlier, the latest version of *Teaching Physical Education* (Mosston & Ashworth, 2008) (fifth and first online edition) now identifies 11 teaching styles which are referred to as landmark teaching styles. Further refinements to *The Spectrum* (Mosston & Ashworth, 2008) were realised, however, to cater for configurations of decision making that could not be analysed as one of the 11 landmark teaching styles. As previously outlined, these particular decision making structures were labelled as non-landmark styles that exist "under the canopy of the nearest landmark style" (Goldberger et al., 2012, p. 274). In Mosston's (1981) revised schema the vertical lines located between each teaching style were supplanted with fragmented lines. This initiative sort to "illustrate that decisions flow between styles and the separation is permeable and that styles are not discrete" (Goldberger et al., 2012, p.274). As mentioned previously, the idea of canopy designs was first referenced in the third edition of *Teaching Physical Education* (Mosston & Ashworth, 1986). The latest edition of *Teaching Physical Education* (Mosston & Ashworth, 2008), provides further details and developments of canopy designs. The current edition of *Teaching Physical Education* (Mosston & Ashworth,

2008) incorporates many more theoretical and practical refinements from the fourth edition (Mosston & Ashworth, 1994). For instance, due to the importance and relevance to all teaching-learning styles, supplementary chapters on feedback, cognition, and designing subject matter were included. These additional chapters form only part of the vast amount of literature surrounding the conceptions of feedback, cognition and designing subject matter. The information presented in these extra chapters, however, was considered sufficient and appropriate for this study.

2.20 Research on *The Spectrum*

The following discussion of research on *The Spectrum* (Mosston & Ashworth, 2008) is provided to present a comprehensive overview rather than an exhaustive description of all research initiatives. The basis of these research studies relate to the version of *The Spectrum* (Mosston & Ashworth, 2008) at the time. This overview will commence with a summary of early research conducted on *The Spectrum* (Mosston & Ashworth, 2008) until 1980. The review will then provide a summary of research from the *reproduction cluster* followed by the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) since 1980. A significant proportion of early research conducted on *The Spectrum* (Mosston & Ashworth, 2008) focused on investigating Mosston's (1966) proposal "that the greater the decision making afforded the learner, the greater the advantage for change in learner growth on the physical, social, emotional, and intellectual dimension" (Byra, 2000, p. 231). In an effort to conclude what effective teaching is, researchers employed a "process-product research paradigm to investigate relationships between teacher behaviour and learner achievement or the efficacy of different methods" (Chatoupis, 2010, p. 83). Initial research on *The Spectrum* was originally founded on that process-product view which tested "the hypothetical relationships between particular teaching styles and certain learning outcomes" (Chatoupis, 2010, p. 83). Initial attempts to assess those relationships occurred in the 1970s, with a total of six doctoral theses (Boschee, 1972; Chamberlain, 1979; Dougherty, 1970; Jacoby, 1975; Gerney, 1979; Virgilio, 1979), two unpublished manuscripts (Bryant, 1974; McCleary, 1976) in addition to one research project conducted in 1976 by Mariani. Each one of these research endeavours maintained the tradition of contrasting the value of distinct teaching styles with an outlook to investigate the claims asserted by Mosston.

In a review of research on *The Spectrum* (Mosston & Ashworth, 2008) by Chatoupis (2010) from the 1970s and onwards, the principle features of these initial research endeavours consisted of:

- Research that involved the implementation of two or more *teaching styles* from the *reproduction cluster* (Self-Check Style- was not researched).
- Measurement of fitness/motor skill development related to various sports (gymnastics, alley soccer, softball, hockey, archery, tennis), social/self-concept development and attitude.
- Data analysis. The pretest-posttest group design predominantly involving elementary school children in fifth and sixth grades. (p. 83)

The duration of these studies ranged from three to six weeks with one study 14 weeks (Dougherty, 1970). A summary of these early research initiatives are provided

in **Table 2.1**.

Table 2.1: A summary of early research conducted on *The Spectrum.*

Author & Date	Variables tested
Mariani (1970)	A comparison of the effectiveness of the Command method and the task method of teaching the forehand and the backhand tennis strokes.
Dougherty (1970)	A comparison of the effects of Command, Task, and Individual Program Styles of teaching in the development of physical fitness and motor skills
Boschee (1972)	A comparison of the effects of Command, Task and Individual Program styles of teaching on four developmental channels
Bryant (1974)	Comparison of the Practice and Reciprocal styles of teaching
Jacoby (1975)	A comparison of the effects of Command, Reciprocal, and Individual Program styles of teaching on the development of selected sport skills
McCleary (1976)	A comparison of the Task and Problem Solving styles in teaching kindergarten and first grade students
Chamberlain (1979)	The effects of Mosston's Practice style and Individual Program-Teacher Design on motor skill acquisition and self-concept of fifth grade learners
Virgilio (1979)	The effects of direct and Reciprocal teaching strategies on the cognitive, affective, and psychomotor behaviour of fifth grade pupils in beginning archery
Gerney (1979)	The effects of Mosston's Practice style and Reciprocal style on psychomotor skill acquisition and social development of fifth grade students

The results of these early studies revealed no significant differences between the Command Style, Task, and Individual Program Styles of teaching on learner fitness and motor skill performance. In the study by Boschee (1972), involving the same three teaching styles, it was revealed that no significant differences existed between the teaching styles on learner physical, social, emotional, and intellectual development. In the study by Gerney (1979), who explored the Reciprocal and Practice (task) teaching styles, it was also shown that no significant difference was evident between the two styles relating to skill acquisition and hockey skills (Byra, 2000). When findings revealed a significant difference, these were decidedly mixed (Byra, 2000). This was evident in the study by Mariani (1970), who found that male college students receiving instruction in the Task Style (the Task Style was later changed to Practice Style-B) recorded higher scores when presented with a post-test compared to learners who received more traditional instruction via the Command teaching style. However, the results also indicated that no differences were found between the groups for the background groundstroke. According to Byra (2000), "the premise on which the studies were conducted during the early era is no longer supported by Mosston (1981) and Mosston and Ashworth (2008)" (p. 321). According to Mosston (1981):

> The conceptual basis of the Spectrum rests on the "non-versus" notion. That is, each style has its place in reaching a specific set of objectives; hence, no style, by itself, is better or best … Each style is equally important. (p. viii)

With regard to these early research studies Chatoupis (2010) asserted that all the studies "suffered from methodological and statistical flaws" (p. 83). Byra (2000) submitted that these shortcomings possibly contributed to the many "methodological problems that plagued the early Spectrum research" (Byra, 2000, p. 321). He summarised these as:

> (a) Inadequate definition of experimental treatment, (b) inadequate control over treatment applications, (c) adoption of abbreviated treatment periods, often too short to promote any change in student learning, (d) the use of college students as study participants rather than elementary and secondary students, and (e) research conducted by graduate students rather than experienced university researchers. (p. 321)

Despite these inadequacies, early research on *The Spectrum* (Mosston & Ashworth, 2008) also contributed to guiding current researchers to "more accurately and thoroughly understand the theoretical premises underlying the teaching styles" (Chatoupis, 2010, p. 85), as well as "conduct more valid research questions about *The Spectrum* and appropriate research methods" (Chatoupis, 2010, p. 85).

Research on *The Spectrum* (Mosston & Ashworth, 2008) that has been conducted since 1980 shares common features with earlier research initiatives with regard to teaching styles used or student outcomes measured. In spite of these similarities, the more recent era of research studies, "address more diverse and varied questions concerning multiple human dimensions and domains of learner development than in the 1970s" (Chatoupis, 2010, p. 85). Moreover, teaching styles are investigated with learners of diverse ages and capabilities. In addition to these advancements, researchers have "begun to cross the discovery threshold and investigate teaching styles from the Production cluster" (Chatoupis, 2010, p. 85). An outline of published research conducted on the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) since 1980 is provided in **Table 2.2**.

Table 2.2: A summary of the research conducted on the *reproduction cluster* of *The Spectrum* since 1980.

Author and Date	Variables tested
Gerney (1980)	The effects of Mosston's Practice Style-B and Reciprocal Style-C on psychomotor skill acquisition and social development.
Goldberger, Gerney & Chamberlain (1982)	The effects of three styles of teaching on the psychomotor performance of fifth grade children.
Goldberger & Gerney (1986)	The effects of direct teaching styles on motor skill acquisition of fifth grade children.
Goldberger & Gerney (1990)	Effects of learner use of practice time on skill acquisition of fifth grade children.
Beckett (1991)	The effects of two teaching styles on college students' achievement of selected Physical Education outcomes.
Boyce (1992)	The effects of three styles of teaching on university student's motor performance.
Byra & Marks (1993)	The effect of two pairing techniques on specific feedback and comfort levels of learners in Reciprocal Style-C.
Goudas, Biddle, Fox & Underwood (1995)	Motivational effects of Inclusion Style-E of teaching in track and field for 13 year old girls.
Ernst & Byra (1998)	Investigating how student learning (physical, cognitive, and social) is best facilitated in the Reciprocal Style-C of teaching with High School students.
Byra & Jenkins (1998)	The thoughts and behaviour of learners in the Inclusion Style-E of teaching.
Chatoupis & Emmanuel (2003)	The effects of two disparate instructional approaches (Practice Style-B and Inclusion Style-E) on self-perceptions in elementary P.E.

AlMulla-Abdullah (2003)	The effectiveness of Reciprocal Style-C on the level of shooting skills in team handball.
Alhayek (2004)	The effects of using two basketball teaching styles (Practice Style-B and Reciprocal Style-C) on Physical Education students' skills and attitudes.
Sunay, Gunduz, & Dolsair (2004)	The effects of different methods (Command Style-A and Guided Discovery Style-F) in teaching basic volleyball techniques to Physical Education candidates.
Abd Al-Salam & Al-Naddaf (2004)	The effects of three styles of teaching (Command Style-A, Practice Style-B, and Self-Check Style-D) styles on the performance level and practice trials of long serve and short serve n badminton.
Chatoupis (2005)	Effects of Practice Style-B and Inclusion Style-E on perceived athletic competence of Greek primary school children.
Derri & Pachta (2007)	Motor skills and concepts acquisition and retention: a comparison between two styles of teaching (Command Style-A and Guided Discovery Style-F).
Al Naddaf & Al-Kuraymeen (2007)	The effect of using three types of feedback on learning the overhead service in volleyball by using Inclusion Style-E.
Patmanoglou, Digelidis, Mantis, Papapetrou & Mavidis (2007)	The impact of Command Style-A and Self-Check Style-D on goal orientations, perceived motivational climate, and perceived athletic ability in the elementary.
Patmanoglou, Mantis, Digelidis, Tsigillis, Papapetrou (2008)	The Command Style-A and Self-Check Style-D for more effective teaching of tennis at the elementary school.
Chatoupis (2008)	The effects of two teaching styles (Practice Style-B and Inclusion Style-E) on physical fitness of fifth graders.
Proios & Proios (2008)	The effects of teaching styles (Practice Style-B and Reciprocal Style-C) of gymnastics and basketball exercises on children's moral development within Physical Education.
Yoncalik (2009)	The effects of three teaching styles (Command Style-A, Practice Style-B and Reciprocal Style-C) on elementary sixth grade student's achievement in Physical Education lessons.
Zeng, Leung, Liu & Bian (2009)	Learning outcomes taught by three teaching styles (Practice Style-B, Reciprocal Style-C and Inclusion Style-E) in College volleyball classes.
Iserbyt, Elen & Behets (2010)	Instructional guidance in Reciprocal peer tutoring with task cards.

One of the first researchers to perform a study designed to address some of the limitations associated with early research on *The Spectrum* (Mosston & Ashworth, 2008) was Griffey (1983). This study investigated student skill learning of the forearm pass and serve in volleyball using the Command Style-A and Task teaching styles (the Task Style was later changed to Practice Style-B). Compared to previous research endeavours, Griffey (1983), "systematically verified the application of treatments and considered students' initial ability level" (Byra, 2000, p. 323). During the first half of 1980, Goldberger, Gerney, and Chamberlain (1982, 1986) completed two studies that focused on Practice Style-B, Reciprocal Style-C, and Inclusion Style-E. The principle objective of this initiative was "not to determine which style was better, but rather to see if different formats produced different levels of learning" (Byra, 2000, p. 324). In these studies treatment conditions were more adequately defined when compared with research conducted throughout the 1970s. The findings from these studies demonstrated that the students who received instruction using the Practice Style-B revealed the greatest rates of change. Almost 25 years later, Zeng, Leung, Liu, & Bian (2009), examined learning outcomes of Practice Style-B, Reciprocal Style-C and Inclusion Style-E in collegiate fundamental volleyball skill classes. The participants in this study were 72 college students who were enrolled in fundamental volleyball skill classes. It was concluded that for the male learners, Practice Style-B was the most effective, followed by Reciprocal Style-C and Inclusion Style-E.

Results from other research found similar results (Goldberger & Gerney, 1986; Beckett, 1991; Boyce, 1992; Jenkins & Byra, 1997). These studies illustrated that Practice Style-B was found to be highly successful in generating skill acquisition in college-aged students when juggling (Beckett, 1991) and rifle shooting (Boyce, 1992). Employing this teaching style was also found to foster skill changes in fourth and fifth grade students when performing a striking action with a long-handled implement (racquet) (Jenkins & Byra, 1997). Practice Style-B was also considered most effective when compared to Command Style-A and Self-Check Style-D on University students' achievement of the long-high and short-low serves in badminton (Abd Al-Salam, 2004). Collectively, these studies indicate that Practice Style-B is highly effective in "promoting motor skill changes in school aged and college aged students" (Byra, 2000, p. 324). Practice Style-B was also examined with regard to the "effect of two different organisational formats as presented within the instructional framework of the Practice style of teaching" (Byra, 2000, p. 324.). The first format consisted of students from the fifth grade rotating from one activity station to another in a distinctive order after a set time limit. In this format, the students rotated on the command of the teacher (teacher-rotate). In the second format, the students determined the time and order of the rotations (learner-rotate). The results indicated that both formats were effective in developing student learning. The learner-rotate format proved to be more effectual with students of low-ability.

Self-Check Style-D was not the subject of any published research until the study by Abd Al-Salam (2004). This study compared the effects of three teaching styles (Command Style-A, Practice Style-B, and Self-Check Style-D) on University students' achievement of the long-high and short-low serves in badminton. Since this research project, Self-Check Style-D has been examined in three other published studies (Patmanoglou, Digelidis, Mantis, Papaetrou, Mavidis, 2007; Patmanoglou, Mantis, Digelis, Tsigilis, Papapetrou, 2008; Kolovelonis, Goudas, Gerodimos, 2011). In the study by Patmanoglou and others, the impact of Self-Check Style-D and

Command Style-A in goal orientations, perceived motivational climate, and perceived athletic ability were examined. The findings of this study indicated that Self-Check Style-D produced higher scores in all three categories when compared to instruction under the conditions of Command Style-A. In evaluating Self-Check Style-D and Command Style-A for the more effective teaching format of tennis instruction for 307 fifth and sixth grade students, this study revealed that Self-Check Style-D provided "more and better solutions in the context of a tennis teaching program" (Patmanoglou et al., 2008, p. 26). The most recent study to explore Self-Check Style-D teaching style was conducted by Kolovelonis, Goudas and Gerodimos (2011). This study examined the effects of Self-Check Style-D and Reciprocal Style-C on pupils' performance in primary Physical Education. Participants were 64 fifth and sixth grade students. The results demonstrated that the three experimental groups outperformed the control group in chest pass accuracy and form, but no differences among the experimental groups were found. This showed that the reciprocal and the self-check styles are effective in improving students' performance.

Reciprocal Style-C has been the subject of other research endeavours and was first examined by Goldberger, Gerney and Chamberlain (1986). The findings of this study indicated that as well as demonstrating improved performance, the learners "provided more feedback, expressed more empathy, offered more praise and encouragement to each other, and requested more feedback from each other when compared to the control group" (Goldberger, 1992, p. 43). In their study, Byra and Marks (1993), explored the impact different pairings of students had on elementary-age students during lessons conducted with Reciprocal Style-C. This study indicated that the students provided a greater amount of feedback to their partners who were their friends and "felt more comfortable receiving feedback from friends than non-acquaintances" (Byra, 2000, p. 325). Reciprocal Style-C was also explored in a study by Ernst and Byra (1998). In this study the juggling skills of 60 junior high school learners were assessed. All the students improved their juggling skills, as well as reporting to that "giving feedback to and receiving feedback from a partner was a positive experience" (Byra, 2000, p. 325).

Further studies have investigated the effectiveness of Reciprocal Style-C in the learning of a variety of skills. For instance, AlMulla-Abdullah (2003), examined the effectiveness of this teaching style on the level of shooting skills acquisition in team handball. This study found positive benefits of instructing this skill under the conditions of Reciprocal Style-C. Similarly, Iserbyt, Efen, and Behets (2010), exhibited the benefits associated with Reciprocal Style-C instruction. They found that when students were taught Basic Life Support Services (BLSS) with a defined doer-observer relationship (Reciprocal Style-C), they retained and recalled all BLS skills more efficiently than the control group. This group received no guidance about organising their learning conditions. In yet another study, conducted by Yoncalik (2009), it was concluded that Reciprocal Style-C generated results in teaching psychomotor skills as effective as those of Command Style-A.

In a study by Cox (1986) student behaviour was assessed within the instructional formats of Command Style-A, Practice Style-B and Reciprocal Style-C. The findings revealed that all styles resulted in the same amount of skill movement attempts. Students instructed with Reciprocal Style-C demonstrated very few anti-social behaviours compared with Command Style-A and Practice Style-B that

recorded significant levels of disruptive and belligerent behaviour. In another study performed by Proios and Proios (2008) which compared the effects of Practice Style-B and Reciprocal Style-C instruction of gymnastics and basketball exercises on children's moral development, it was discovered that no statistically significant differences in moral judgements were found.

In studies by Goldberger, Gerney, and Chamberlain (1982, 1986), Beckett (1991), Goudas, Biddle, Fox, and Underwood (1995), Byra and Jenkins (1998) and Jenkins and Byra (1997), decision making and learner performance were examined during the employment of Inclusion Style-E. Findings indicated that despite Inclusion Style-E being effective in generating improvement relating to skill performance, Practice Style-B produced the greatest gains (Goldberger, Gerney & Chamberlain, 1982; Goldberger & Gerney, 1986). However, in another study, by Beckett (1991), Inclusion Style-E was found to be as effective as Practice Style-B "for learner skill performance, and as suitable for learners of average and exceptional aptitude for learning motor skills" (Byra, 2000, p. 327). On the other hand, the motivational influences of Inclusion Style-E that were relevant in track and field, were investigated by Goudas and others (1995). Results from this study, involving 13 year old girls receiving track and field instruction in Practice Style-B and Inclusion Style-E, revealed that the students expressed a preference for Inclusion Style-E instruction. The girls reported to having greater control over the activities they performed as well as the degree of effort they desired to display. These particular findings represent the premise of Inclusion Style-E that entails, "individualizing instruction to permit greater student success is the underlying premise of the Inclusion style of teaching" (Byra, 2000, p. 327).

Byra and Jenkins (1998) investigated the decision making of learners under the instruction of Inclusion Style-E. In this study, fifth grade students made decisions about the level of task difficulty with regard to striking skills with a bat. It was discovered that the students did choose different levels of task difficulty when given the opportunity, and also made decisions concerning the difficulty of the task in accordance with their views on "success, challenge, and curiosity" (Byra, 2000, p. 328). In relation to the explored gains in student knowledge when instructed with Inclusion Style-E, Beckett (1991) discovered that college students who were taught juggling skills using this teaching style scored considerably higher on a written knowledge assessment compared to students who were instructed with Practice Style-B. Similarly, Jenkins and Byra (1997) discovered that when instructed under the conditions of Practice Style-B and Inclusion Style-E, elementary-aged learners obtained significant improvement with regard to the number skill elements recorded from pretest to post-test. The learners in Inclusion Style-E, however, recorded a higher number of skill elements during post-test compared with the learners who were instructed with Practice Style-B. These results lend support to Mosston and Ashworth's (2008) claim that "learners should understand and recall elements of task performance better when taught in a style that requires the learners to assess their own skill performance" (Byra, 2000, p. 328).

The effects of Mosston and Ashworth's Practice Style-B and Inclusion Style-E on the perceived athletic ability of fifth grade students was conducted in two separate studies by Chatoupis & Emmanuel (2003) and Chatoupis (2005). In the first study no significant differences were recorded between the two teaching styles with respect to perceived athletic ability. However, the findings from the study in 2005 by

Chatoupis on the perceived athletic competence of 111 fifth grade students showed that the students instructed in Inclusion Style-E style demonstrated significantly higher perceived competence than students taught using Practice Style-B. Chatoupis (2008) continued his investigations in connection with Practice Style-B and Inclusion Style-E with an examination of the effects of these teaching styles on power of lower limbs, muscular endurance of abdominals, and the agility of 120 students. Outcomes indicated that instruction using Practice Style-B was more effective for the standing long jump and sit-up test, yet instruction representing Inclusion Style-E outperformed Practice Style-B in agility (shuttle run test).

Three published studies since 1980 have investigated the differences between teaching styles in the *reproduction* and *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) (Sunay, Gunduz, & Dolsair, 2004; Derri & Pachta, 2007; Alhayek, 2008). In the first study, (Sunay, Gunduz, & Dolsair, 2004) thirty Physical Education students were taught basic volleyball techniques over a 14 week period. The findings from this study showed that Command Style-A had an effective role in teaching technique, while Guided Discovery Style-F had a limited influence. In the study by Derri and Pachta (2007) 59 six to seven year old learners were taught manipulative skills and concepts using Command Style-A or Guided Discovery Style-F. Findings revealed that the students in the Command Style-A treatment achieved significantly lower scores in retention measures when compared to their acquisition scores. Comparing Reciprocal Style-C and Guided Discovery Style-F teaching styles, Alhayek (2008), in his study of 20 undergraduate Physical Education basketball students, found that the Reciprocal Style-C group scored higher in communication, social and psychological skills. Students in the Guided Discovery Style-F group received higher scores in the categories related to physical and sports skills and thinking skills.

The summary below illustrates what researchers have generally discovered about research conducted on *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) from 1980 to 2012:

- Practice Style-B has been studied most frequently, followed by Reciprocal Style-C and Inclusion Style-E.
- Command Style-A, Practice Style-B, Reciprocal Style-C, and Inclusion Style-E are effective in promoting motor skill acquisition in school-age and college-age students.
- Low ability fifth grade students perform better with Practice Style-B when given the opportunity to allocate practice time differentially, and spend more time practising tasks yet mastered.
- More feedback is given to the performer in Reciprocal Style-C than in Command Style-A, Practice Style-B, or Inclusion Style-E.
- In Reciprocal Style-C of teaching elementary-age learners give the greatest amount of feedback to a partner who is selected on the basis of being an acquaintance.

- In the Reciprocal Style-C of teaching, pairing by ability level (same or mixed) seems to have little effect on the amount of feedback a partner provides.

- Elementary and junior high learners are most comfortable giving and receiving feedback (Reciprocal Style-C) from partners who are friends.

- Elementary-age students emit fewer antisocial behaviours in a Physical Education setting where equipment and facilities are limited when instruction is provided with Reciprocal Style-C compared to Command Style-A and Practice Style-B.
- Research findings related to skill acquisition are mixed for exceptional learners (high and low) when instructed with Inclusion Style-E.
- When given the opportunity to engage in activity at an appropriate level (Inclusion Style-E) fifth graders consistently selected different levels of task difficulty.
- Fifth graders reported success and challenge most frequently as reasons for making a task less or more difficult in Inclusion Style-E.
- Greater knowledge gains were reported by college-age and elementary-age learners in the Inclusion Style-E of teaching compared to Practice Style-B.
- Adolescent girls reported a preference to Inclusion Style-E (over Practice Style-B) for reasons associated with intrinsic motivation (greater autonomy and effort, and less anxiety)
- Self-Check Style-D is effective in increasing the motivational climate, goal orientations and perceived athletic ability of elementary students. (Byra, 2000, pp. 328-329)

Since the 1980s minimal research initiatives have been performed on the *production cluster* (Styles F-K) of *The Spectrum* (Mosston & Ashworth, 2008) (Byra, 2000). The teaching styles located in this *cluster* are "dependent upon the learner producing new knowledge to self or teacher" (Byra, 2000, p. 233). A literature review revealed a total of eight research initiatives that have been conducted on the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) (Byra, 2000). A summary of published research that has been employed on the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) since 1980 is described in **Table 2.3**.

Table 2.3: A summary of the research conducted on the *production cluster* of *The Spectrum* since 1980.

Salter & Graham (1985)	The effect of three disparate instructional approaches (Command Style-A, Guided Discovery Style-F and No style).
Cleland & Gallahue (1993)	Examining how different factors might contribute to a child's production of divergent movement using the Divergent Discovery Style-H.
Cleland (1994)	Examining the effect of content and specific teaching styles (Divergent Discovery Style-H, Practice Style-B, Command Style-A) on learner ability to produce divergent movement
Cleland & Pearse (1995)	Physical education specialists use of Divergent Style-H and Convergent Style-G to promote critical thinking
Cleland, Donnelly, Helion, & Fry (1999)	How teachers could promote critical thinking in children in the Physical Education setting using Guided Discovery Style-F, Convergent Discovery Style-G and Divergent Discovery Style-H.
Sunay, Gunduz, & Dolsair (2004)	The effects of different methods (Command Style-A and Guided Discovery Style-F) in teaching basic volleyball techniques to Physical Education candidates.
Derri & Pachta (2007)	Motor skills and concepts acquisition and retention: a comparison between two styles of teaching (Command Style-A and Guided Discovery Style-F).
Alhayek (2008)	The effect on using two Physical Education teaching styles (Reciprocal Style-C and Guided Discovery Style-F) on Physical Education students' life skills achievement.

Salter and Graham (1985) generated the first published research project that included a teaching style from the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008). This study investigated the effect of three disparate instructional approaches on skill learning, cognitive learning, skill attempts, and rating of self-efficacy. Instruction was presented under the conditions of Guided Discovery Style-F, Command Style-A and no-instruction style guidelines to 244 elementary-aged students. This study revealed that "under the guided discovery and command instructional conditions, where information was offered, learners demonstrated a higher level of cognitive understanding" (Byra, 2000, p. 240). In a second study, Cleland and Gallahue (1993) examined the divergent movement of learners aged between four and eight years to determine "baseline information about children's divergent movement patterns, and to examine different factors that might contribute to a child's production of divergent movement" (Byra, 2000, p. 237). It was demonstrated that "experience and age were found to be factors that contributed to a child's ability to produce divergent movement" (Byra, 2000, p. 237). Cleland (1994) was also involved in a third study concerning teaching styles located in the

production cluster of *The Spectrum* (Mosston & Ashworth, 2008). In this study, the author arbitrarily allocated 50 students from the second and third grade to three instructional groups, including: (a) Divergent Discovery Style-H (content based on skill themes and movement concepts, (b) Command Style-A and Practice Style-B (content based on low organised games), and (c) control group with no instruction. The aim of the research project was to investigate "the effect of content and specific teaching styles on learner ability to produce divergent movement" (Byra, 2000, p. 239). It was shown that the learners instructed under the conditions of Divergent Discovery Style-H engendered substantially more divergent movement patterns in comparison with students who were instructed with Command Style-A, Practice Style-B and the control group (no instruction).

In a study conducted one year later regarding fifth grade students' critical thinking skills in Physical Education over a one year period, Cleland and Pearse (1995) found that Divergent Discovery Style-H and Convergent Discovery Style-G could be employed to foster critical thinking among students of this age group. In 1999, Cleland and colleagues investigated how teachers could promote critical thinking in children in the Physical Education setting using Guided Discovery Style-F, Convergent Discovery Style-G and Divergent Discovery Style-H (Cleland, Donnelly, Helion & Fry, 1999). Following a rigorous intervention program that provided instruction on how to implement the teaching styles (Guided Discovery Style-F, Convergent Discovery Style-G and Divergent Discovery Style-H), three lessons of each teacher's instruction were video-recorded. It was revealed that all four of the teachers were successful in adopting the three teaching styles located in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) during their lessons to promote critical thinking. In a study by Derri and Pachta (2007) 59 six to seven year old learners were taught manipulative skills and concepts using Command Style-A or Guided Discovery Style-F. The outcomes illustrated that the students instructed under the conditions of Command Style-A realised substantially inferior scores in retention measures when compared to their acquisition scores in the categories related to Physical Education and sports skills.

The summary below illustrates research conducted on the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) from 1980 to 2012.

- When instructed within the Divergent Production style, children can modify, adapt, or combine fundamental movement patterns to produce divergent movement.
- Experience and age are factors that contribute to a child's ability to produce divergent movement while engaged in the Divergent Production teaching style.
- Children who receive instruction in the Divergent Production style are more capable of generating divergent movement patterns than children who receive instruction in a combination of the Command and Practice styles.
- Children's ability to produce divergent movement in a Physical Education setting is dependent on the teacher's ability to effectively use the Divergent Production and Convergent Discovery teaching styles.
- Opportunity for elementary-age learners to attempt skill trials in the Guided Discovery and Command styles is similar.

- The Guided Discovery style is as effective in fostering student skill and cognitive learning in an elementary population as the Command Style. (Byra, 2000, pp. 331-332)

While research has indicated the increasing importance of teachers' and coaches' understanding and mastery of various teaching styles, only a limited number of studies have explored the employment of teaching styles using *The Spectrum* (Mosston & Ashworth, 2008). All of these studies have focused on of Physical Education teachers (Hasty, 1997; Curtner-Smith, Todorovich, McCaughtry and Lacon (2001; Kulinna & Cothran, 2003; Cothran, Kulinna & Ward, 2000; Cothran, Kulinna, Banville, Choi, Amade-Escot, MacPhail, Macdonald, Richard, Sarmento, & Kirk, 2005; Jaakkola & Watt, 2011; SueSee, 2012).

In the study conducted by Curtner-Smith, Hasty and Kerr (2001) 16 Physical Education teachers were observed to see whether the introduction of National Curriculum Physical Education (NCPE) led to an expansion of the teaching styles they employed. This study revealed that the percentages of time in which teachers employed each of the teaching styles before and after the introduction of NCPE were not significantly different. It was also found that teachers spent most of the time using direct styles of teaching. In a similar study, Curtner-Smith and colleagues employed observations to describe the teaching styles employed by a sample of 18 Physical Education teachers working in a depressed urban setting under the conditions of the revised NCPE. The study also focused on comparing the teaching styles used by this urban sample of teachers with those employed by a rural sample. The results from this study indicated that the teachers spent the majority of their time using teaching styles *in the reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008).

Exploring the perceptions of Physical Education teachers with reference to teaching styles has also been pursued. In a study by Kulinna and Cothran (2003) 212 Physical Education teachers were presented with a survey instrument that included a scenario for each teaching style followed by one question relating to their experience with the style and three questions addressing their perceptions of the style. The survey questions related to the perceived benefits of implementing different teaching styles. These benefits included: for fun, learning or motivation. This study revealed that teachers had notably diverse experiences in relation to the use and perceptions of various teaching styles. The teachers' perceptions also varied according to their ability to teach numerous teaching styles. Using similar methodology, Cothran and colleagues (2005) conducted a cross-cultural investigation of the use of teaching styles among Physical Education teachers. Over 1,400 teachers from seven countries completed a survey related to their self-reported use of and beliefs about various teaching styles. This study also explored the teachers' beliefs pertaining to the potential benefits of using certain teaching styles. Results from this study suggested that teachers worldwide reported using a wide variety of teaching styles. It also discovered that direct teaching styles were more commonly employed and positively perceived than indirect teaching styles, irrespective of the country (Cothran et al., 2005).

Another study, by Jaakkola and Watt (2011), analysed the teaching styles of 294 Finnish Physical Education teachers. In this study the participants responded to

survey questions that pertained to their use and perceived benefits to students of various teaching styles. Another aim of this study was to investigate the relationships between the background characteristics of teachers and use of teaching styles. The results of this study indicated that teachers used direct teaching styles most frequently. It was also found that teachers perceived Practice Style-B and Divergent Style-H as most beneficial for students. Reciprocal Style-C and Convergent Style-G was reported as least beneficial for students.

The most recent study to date has involved researching the incongruence between the self-reported and observed teaching styles of senior Physical Education teachers in Queensland, Australia (SueSee, 2012). This study employed a survey questionnaire and observations to explore the teaching styles that 110 Senior Physical Education teachers believed they use during class in addition to observing nine teachers to assess the teaching styles they were actually employing. The results from this study revealed that teachers reported using a variety of teaching styles yet when video-recorded sessions of the nine teachers were coded a variety of styles were not observed. Another significant and highly expedient aspect of this doctoral study was the development of a tool designed for researchers and teachers to distinguish the teaching styles being employed from *The Spectrum* (Mosston & Ashworth, 2008) when teaching Physical Education. The *Instrument for collecting teachers' beliefs about their teaching styles used in Physical Education: Adaption of description inventory of landmark teaching styles: A spectrum approach* (SueSee, Ashworth, & Edwards, 2007) was also intended for "self-assessment of the teaching styles and individual uses, or those who work with Physical Education courses" (SueSee & Edwards, 2009, p. 155).

2.21 Future research on *The Spectrum*: Recommendations

In the paper by Chatoupis (2010) *Spectrum Research Reconsidered*, several crucial assertions are maintained about implementing future research on *The Spectrum* (Mosston & Ashworth, 2008). The areas relating to "methodology, fidelity between theory and action, and a rational relationship between style and outcome must be seriously considered" (Chatoupis, 2010, p. 91). In stating these general areas, Chatoupis (2010) provided specific suggestions "for conducting sound SR (Spectrum Research) and expanding the field" (Chatoupis, 2010, p. 34). Firstly, a significant limitation of early research involving *The Spectrum* (Mosston & Ashworth, 2008) was the lack of observation. According to Silverman (1985) treatment is not verified if observations are not employed. Furthermore, the implementation of observation demands the development and promotion of legitimate and dependable observational methods that conform to *The Spectrum* (Mosston & Ashworth, 2008) theory. In the absence of these elements, "SR (Spectrum research) will be idiosyncratic and unreliable" (Chatoupis, 2010, p. 91). A second consideration that has been submitted to ensure that future research involving *The Spectrum* (Mosston & Ashworth, 2008) achieves appropriate measures of validity and reliability is the necessity of reducing deficiencies that have been evident in many studies. These include:

- Non-compliance to *The Spectrum* (Mosston & Ashworth, 2008) theory (ignoring the decision patterns, comparing the landmark objectives of one style against a different style).

- Inappropriate style comparison (reproduction styles against production styles).
- Inappropriate subject matter selection (teach dribbling in basketball with the command style).
- Short duration of the fieldwork. (Chatoupis, 2010, p. 91)

In light of these recommendations, the present study made every effort to address the above considerations to maximise its validity and reliability. It must also be considered that the research was conducted using various versions of *The Spectrum*.

2.22 A critique of *The Spectrum*

Although research has recognised the contributions of *The Spectrum* (Mosston & Ashworth, 2008) to Physical Education pedagogy (Goldberger, 1992; Graber, 2001) the work of Mosston has been the subject of critique, misunderstanding and modification. While some scholars have attempted to elucidate and modify *The Spectrum* (Mosston & Ashworth, 2008) (Crum, 1995; Digelidis, 2006; Hurwitz, 1985; Krug, 1999) others have highlighted what they consider to be problems associated with it. A number of sports pedagogy writers (Hurwitz, 1985; Metzler; 1983; Sicilia-Camacho & Brown; Williams, 1996) have identified various problematic issues. According to Metzler (2005) *The Spectrum* (Mosston & Ashworth, 2008) represents a decidedly limited perspective of instruction and fails to "address the full range of theoretical, design, planning, and assessment considerations in Physical Education instruction" (Metzler, 2005, p. 187). Metzler also suggested that *The Spectrum* (Mosston & Ashworth, 2008) places an overemphasis on teacher behaviour by illustrating in detail what the teacher is expected to do when a particular teaching style is being employed. This outcome is believed to result in discounting student process behaviour which largely affects achievement and instructional success. In addition, *The Spectrum* (Mosston & Ashworth, 2008) has been criticised for a distinct lack of sequential description of student and teacher behaviours. In other words, it fails to adequately provide a description of the sequence in which teacher and student behaviour is meant to occur within any teaching style (Hurwitz, 1985). Realising the precise sequence in which these behaviours occur is crucial to planning (Hurwitz (1985). This critique was based on the 2nd edition of *Teaching Physical Education* (Mosston, 1981). Additional criticism in relation to neglecting the context of learning has also been levelled at *The Spectrum* (Mosston & Ashworth, 2008**)**. Williams (1996) claims that the learning styles of students are not considered and that more effective learning is realised when the teaching style employed is consistent with the favoured learning style of the student (Williams, 1996).

The Spectrum (Mosston & Ashworth, 2008) has also been the subject of misinterpretation. The critique by Sicilia-Camacho and Brown (2008) has been subsequently discussed in a paper by Goldberger and colleagues who found "some of their understanding to be interesting and thought a retrospective about the Spectrum, would be of interest to the Physical Education scholarly community" (p. 93). Sicilia-Camacho and Brown commented: "the original Spectrum of teaching styles was made up from a collection of eight commonly observed teaching approaches or styles" (Goldberger et al., 2012, p. 87). This, however, was not how *The Spectrum* was developed (Goldberger et al., 2012). Mosston did not collect known teaching

approaches or methods and organise these approaches into a framework (Goldberger et al., 2012). Rather, he developed the framework "from a premise, to the anatomy, and then to the landmark styles … it was revealed in a systematic process of logical uncovering" (Goldberger, 2012, p. 272). In another apparent misinterpretation, Sicilia-Camacho and Brown wrote that a paradigm shift occurred from a "versus (opposing) notion of learning and teaching to a non-versus (non-opposing) notion" (p. 85) of learning and teaching beginning with the second edition of *Teaching Physical Education* (Mosston, 1981). They noted:

> While seemingly innocuous, we contend that this shift can be seen in epistemological terms as an advance (back) towards positivism in PE despite years of dialogue from emerging interpretive standpoints. (p. 85)

Goldberger and others strongly suggest that the authors read more into Mosston's 'paradigm shift' than he intended. They suggest that the shift had more to do with a misrepresentation within his original schema (**Figure 2.10**) than with *The Spectrum* (Mosston & Ashworth, 2008) itself. In Mosston's original schema, the diverging lines "implied directionality, suggesting that teaching should go from Command to Discovery … it seemed to project a biased hierarchical view of the relationship among the styles and so it needed to be changed" (Goldberger et al., 2012, p. 273). Furthermore, on no occasion did Mosston view individual teaching styles as oppositional to each other as Sicilia-Camacho and Brown (2008) suggested in their critique. More accurately, Mosston regarded all the teaching styles as complementary to one another. He perceived the value of each style in relation to the diverse relationships it might possibly establish between the teacher, learner and the content. Ashworth has since provided a robust clarification of this misinterpretation by stating:

> Muska [Mosston] NEVER considered one style more important than another … unfortunately his first diagram represented a VERSUS point of view but his thinking and presenting of styles has always been from a non-versus perspective-that is the foundation of the Spectrum. He was fighting an entrenched Command Style system and he was trying to get teachers and coaches to accept the notion that students could produce ideas along the Spectrum and certainly in Divergent Discovery thinking (that style name was not used until later editions). Discovery and Divergent thinking were not common ideas when Muska began promoting the Spectrum … he pushed the extreme teaching styles in the beginning (called Problem Solving and Going Beyond in the first edition in 1966). Guess you could say that in the beginning Muska's emotions got in his way, he was fighting to educate a profession to accept a Spectrum of alternative teaching approaches and he wanted to show that where these Spectrum ideas could lead to, therefore, he exaggerated the extreme opposing position of Style A. Of course, that was way too extreme for the Command Style system to embrace in the beginning. (S. Ashworth, personal communication, July 2, 2012)

As a consequence of Mosston's original diagram representation depicting *The Spectrum* (Mosston & Ashworth, 2008) many authors incorrectly assumed that Mosston valued teaching styles in the production cluster of *The Spectrum* (Mosston & Ashworth, 2008) more than teaching styles in the *reproduction* cluster. According

to Ashworth (S. Ashworth, personal communication, July 2, 2012) *The Spectrum* (Mosston & Ashworth, 2008) has always been a *non-versus* theory.

Sicilia-Camacho and Brown (2008) also questioned the use of the *reproduction* and *production clusters* on *The Spectrum* (Mosston & Ashworth, 2008). Goldberger and colleagues noted that in the first edition of *Teaching Physical Education* (Mosston, 1966) the clusters had not yet been introduced. These categories were not presented until the third edition published in 1986. Furthermore, the development of the *clusters* was not to position teaching styles in opposition as Sicilia-Camacho and Brown (2008) suggest (Goldberger et al., 2012). Rather, the clusters provide more of a navigational reference point along *The Spectrum* (Mosston & Ashworth, 2008). Sicilia-Camacho and Brown also convey concern regarding the potential for teachers to lose their individuality and creativity when utilising *The Spectrum* (Mosston & Ashworth, 2008). They maintain that: "any pedagogical model that attempts to universalize and objectify will necessarily have to separate personhood from pedagogy, and thereby once again devalue and neglect the important issue of subjectivity" (p. 87). The authors describe the styles as "neutral, technical instructional devices that reflect no particular value" (p. 98). Rather than depersonalising the teacher, *The Spectrum* (Mosston & Ashworth, 2008), has the capacity to provide a comparison between a teacher's intent and behaviour during lessons (Goldberger et al., 2012) Mosston's desire to identify 'universal' pedagogical constructs "was not motivated in the least by a desire to diminish the creativity or individualization of teachers" (Goldberger et al., 2012, p. 274) but rather to provide them with an adaptable "tool through which they can express their creativity and individuality" (Goldberger et al., 2012, p. 274).

Misinterpretation and a lack of comprehensive understanding regarding the concepts and theory of *The Spectrum* (Mosston & Ashworth, 2008) are also evident among some sport pedagogists and researchers. Discussions involving *The Spectrum* (Mosston & Ashworth, 2008) often refer to earlier versions of the pedagogical model that have since been refined. For instance, in their examination of teaching styles, Jones, Hughes and Kingston (2008) refer to Mosston's (1966) original version of *The Spectrum* (Mosston & Ashworth, 2008) that comprises eight teaching styles – the latest version of the model consists of 11. Similarly, some authors have simply misinterpreted some aspects of the theory that underpins *The Spectrum* (Mosston & Ashworth, 2008). Launder (2001) illustrates this point when he stated that "Muska Mosston implied that indirect methods were educationally more valuable than direct methods" (p. 22). As stated earlier, this was not the case.

In an attempt to elucidate the theoretical underpinnings of *The Spectrum* (Mosston & Ashworth, 2008) some authors have adapted certain aspects of Mosston and Ashworth's pedagogical framework. For instance, thirty years after Mosston (1966) produced the initial version of *The Spectrum* (Mosston & Ashworth, 2008) Kirk, Nauright, Hanrahan, Macdonald and Jobling (1996) implemented significant modifications to "make it more user friendly" (Cassidy, Jones & Potrac, 2009, p. 31). The subsequent changes consisted of condensing the number of teaching styles from 11 to 5 as well as replacing the term teaching styles to teaching methods. While Kirk and colleagues (1996) failed to provide an explanation for replacing the term styles for methods, Tinning, Kirk and Evans (1993) suggested that the word styles has come to represent "a manner of self-expression peculiar to the individual" (p. 118)

and, therefore, potentially subjective. It was thought that methods conveyed more of an analytical framework, particularly when a method is described as being "like a set of beliefs about the way certain types of learning can best be achieved … as much a statement about a valued form of knowledge as about procedures for action" (Tinning et al., 1993, p. 123).

Callcott, Miller and Wilson-Gahan (2012) presented an abridged version of *The Spectrum* (Mosston & Ashworth, 2008) that consisted of six teaching styles. In regard to the continuum of teaching styles on *The Spectrum* (Mosston & Ashworth, 2008), this interpretation also referred to "teacher-centred strategies are at one end moving towards the other end of the spectrum to learner-centred strategies" (Callcott et al., 2012, p. 79). In reference to *The Spectrum* (Mosston & Ashworth, 2008), the terms, teacher-centred and student-centred:

> Have been inaccurately applied … the basic and most frequent inaccurate conclusion is that teaching styles A-E are teacher-centred or teacher on-stage and that teaching styles F-K are student-centred or learner on-stage … if teaching is competent and professional all episodes will be student-centred and all styles do focus on the learners as centre stage learners … if the learners' learning is not the focus – then whatever the teacher is doing needs to be re-examined. (S. Ashworth, personal communication, January 30, 2011)

Similarly, Coleman (2012) presented a version of *The Spectrum* (Mosston & Ashworth, 2008) in a podcast for students enrolled in a coaching module. In this online seminar, Coleman refers to ten 'coaching styles' from Command to Discovery as opposed to the 11 teaching styles from Command Style-A to Self-Teaching Style-K that constitute the latest version of *The Spectrum* (Mosston & Ashworth, 2008). Coleman also used the term 'Pre-Discovery coaching styles' to describe the first five teaching styles on *The Spectrum* (Mosston & Ashworth, 2008). Mosston and Ashworth (2008) employ the term, *reproduction cluster* when describing this *cluster* of styles.

2.23 Employing *The Spectrum* in this study

In spite of these modifications, misinterpretations and criticisms, *The Spectrum* (Mosston & Ashworth, 2008) has been embraced and implemented by educators in many countries and widely used as a framework for teaching in the domain of teaching Physical Education (Chatoupis & Emmanuel, 2003; Franks, 1992; Krug, 1999). In fact, in Sicilia-Camacho and Brown's (2008) critical pedagogical perspective, it is suggested that *The Spectrum* (Mosston & Ashworth, 2008) theory has made a significant contribution "to education and PE more generally" (p. 96). Similarly, Mosston's *Teaching Physical Education* (1966) "is considered by many to be the best instructional book ever written in our field" (Metzler, 2005, p. 185).

For almost 50 years, *The Spectrum* (Mosston & Ashworth, 2008) has endured as a renowned pedagogical conception concerning teaching, coaching and research in Physical Education worldwide. It continues to present as a practical framework for the provision of instruction in Physical Education and sport (Harrison, Blakemore, & Buck, 2007; Mohnsen, 2010; Pangrazi & Beighle, 2010; Siedentop &

Tannehill, 2000). *The Spectrum* (Mosston & Ashworth, 2008) has also been widely employed for stimulating student learning (Graham, Holt-Hale, & Parker, 2010; Metzler, 2011; Rink, 2010; Tjeerdsma Blankenship, 2008). Furthermore, *The Spectrum* (Mosston & Ashworth, 2008) has the capacity to observe:

> Any teaching-learning encounter and, with a good degree of accuracy and reliability, agree on which decisions were made by the teacher and learner, and which decisions were not made by anyone, and thus can identify the approximate position of this particular teaching-learning encounter along the decision making continuum. (Goldberger et al., 2012, p. 269)

This notion is particularly relevant in this study given the conceptualisation of different instructional practices and disparate terminology that exists in Tennis Australia's (TA) accreditation manuals. Statements such as *in my opinion* are commonly not necessary when discussing *The Spectrum* (Mosston & Ashworth, 2008). It does not cast judgement with regard to any form of teaching or coaching behaviour but rather "identifies its position along this decision making continuum within the elements of an instructional context" (Goldberger, et al., p. 269). Therefore, while it is acknowledged that *The Spectrum* (Mosston & Ashworth, 2008) does not, for example, have a formal teaching style called Game-Based Approach (GBA), or direct instruction, it does have the capacity to recognise and identify any coaching and learning behaviour. This is based on the premise of *The Spectrum* (Mosston & Ashworth, 2008) that all coaching behaviour is about decision making. This notion provides further evidence of the ability of *The Spectrum* (Mosston & Ashworth, 2008) to identify various forms of coaching behaviour irrespective of how these behaviours might be defined by tennis coaches in this study. The expertise and knowledge of Prof. Sara Ashworth in relation to *The Spectrum* (Mosston & Ashworth, 2008) was frequently provided throughout the study, in particular during the coding of the coaches' observed coaching sessions. While greater refinements and significant advancements in relation to canopy designs have been realised in this text, further research initiatives are required in the future. According to Ashworth, "the canopy is a BIG IDEA that needs to be written about and then researched" (S. Ashworth, personal communication, July 2, 2012).

In a discipline that possesses a marked lack of feasible teaching frameworks (Metzler, 1983) *The Spectrum* (Mosston & Ashworth, 2008) has been celebrated for providing "a set of teaching models, a widely accepted and understood language and a clear model for decision making" (Metzler, 1983, p. 147). It has also provided scholars with a framework to methodically research teaching and learning (Byra & Jenkins, 1998; Pieron, 1995). The following section will provide an outline of research initiatives involving *The Spectrum* (Mosston & Ashworth, 2008) in the discipline of Physical Education and sports coaching.

2.24 Employment of teaching styles: Sports coaches

Although research into the instructional behaviours of Physical Education teachers is informative, it has been suggested that coaches do not display analogous pedagogical characteristics as teachers (Hardin & Bennett, 2002; Nash & Collins, 2006). These distinctions have been attributed to differences in the application of

knowledge in practice for the various roles (Kreber, 2002) in addition to the significant disparities in training times for Physical Education teachers and coaches. Regardless of the reasons, these assertions act as timely reminders that we cannot "blithely assume the transfer of research findings from one context to another" (Harvey, Cushion, & Massa-Gonzalez, 2010, p. 364).

Research focusing on the analysis of Physical Education and sport instruction and the application of descriptive analytical instruments has gathered momentum since the 1970s (Lawson, 1990). This research was seen as "ushering sport pedagogy into an era of legitimacy, innovation and unparalleled activity" (Lyle & Cushion, 2010, p. 45) with a profusion of knowledge, information and understanding with regard to the "type and quality of practitioners' instruction" (Lyle & Cushion, 2010, p. 45). From this basis, research initiatives regarding coach behaviour developed (Lyle & Cushion, 2010). A noticeable characteristic of these investigations "was and continues to be, the examination of observable coach intervention, in particular, coaches' instruction" (Lyle & Cushion, 2010, p. 45). According to Lyle and Cushion (2010) the initial work performed by Tharp and Gallimore (1976) who performed an innovative study involving observations of the instructional behaviours of an elite basketball coach, served to instigate frequent use and continued development of observation tools for examining coaches' behaviour (Smith, Smoll & Curtis, 1979; Lucas, 1980). Subsequently, a variety of observational systems have been cultivated and applied to many sports (Tharp & Gallimore, 1976; Rushall, 1977; Smith, Smoll & Hunt, 1977; Smith et al., 1979; Lucas, 1980; Quarterman, 1980; Metzler, 1983; McKenzie & Carlson, 1984; Crossman, 1985; Lacy & Darst, 1985; Franks, Johnson & Sinclair, 1988).

The implementation of descriptive-analytic techniques and observations has been a pronounced research methodology in the last two decades in the systematic study of coach behavior. According to Gilbert and Trudel (2004) research since 1975 that have focused on various features of coach behaviour appear to suggest that direct observation of coaches is a suitable method for describing the behaviours of coaches during practice and competition sessions. Furthermore, the research conducted to date, employing various observation instruments, have produced insights that have greatly contributed to the body of knowledge in sports pedagogy (Partington & Cushion, 2011; Ford et al., 2010; Mesquita et al., 2008; Cushion & Smith, 2006). As a result, a vast range of literature exists that describes coach behaviour (Bloom, Crumpton, & Anderson, 1999; Lacy & Goldston, 1990; Seagrave & Ciancio, 1990; van der Mars, Darst, & Sariscany, 1991; Cushion & Jones, 2001; Millard, 1996; Miller, 1992, Smith & Cushion, 2006; Mesquita et al., 2008; Ford et al., 2010; Partington & Cushion, 2011). This body of research has revealed consistent results, with direct instruction being the most frequently employed behaviour in college, high school, and youth sport settings with professional elite coaches. In a study by Bloom, Crumpton and Anderson (1999) observation analysis was employed to investigate the teaching behaviours of expert basketball coaches. Results showed that tactical instruction was the most frequently occurring behaviour followed by technical instruction, praise/encouragement, and reprimands. In 2001, Cushion and Jones implemented observations to examine and compare the working behaviours of eight professional top-level English youth soccer coaches. This study revealed high levels of instruction and direction. Similarly, Mesquita and colleagues (2008) examined the coaching behaviours of youth amateur volleyball coaches from Portugal within the practice environment using observations. Consistent with other observational

research in sports settings, instruction was the most frequently observed behaviour by the coaches under study. The findings also demonstrated that the coaches showed a lower use of instructional and praise behaviours compared with that of elite professional coaches as suggested in previous research. In 2010, Ford and colleagues employed observations to examine the practice activities and instructional behaviours employed by 25 youth soccer coaches during 70 different practice sessions. The findings of this study revealed that coaches had players spend more time in activities that were deemed less relevant to soccer match performance, such as physical training, and technique and skills practice, than activities considered more relevant. These game related activities included small-sided/conditioned games and phase of play activities. It was also shown that coaches presented high levels of instruction, feedback, and management, regardless of the activity in which players participated.

In spite of presenting significant insight, it is argued that behavioural research alone does not possess the capacity to offer detail surrounding the cognitive processes that underpin coaching behaviours (Cushion & Jones, 2001; Potrac et al., 2007; Rosado & Mesquita, 2009; Ford et al., 2010). Furthermore, the behaviour of coaches have tended to be explored in isolation (Ford et al., 2010) and despite the general quantity of behavioural research, when separated into context-specific studies, the ability to derive consequential comparison from the work appears narrow. To comprehensively appreciate the holistic function of coaching, it has been suggested that research should focus on the world of individual coaches and how they operate within their individual guidelines and contexts (Potrac, Jones & Armour, 2002). As a result, it has been recommended that research initiatives:

> Address individual coaches' interpretations of their experiences and the processes by which meanings and knowledge are used to guide actions, as such investigation could contribute towards the generation of theory that is faithful to the complex realities of sports coaching. (Potrac et al., 2002, p. 184)

These research initiatives will serve to highlight the knowledge and processes coaches apply that guide their behaviour, while affording a more profound understanding of the aspects that coaches believe explain their performance (Potrac et al., 2002; Smith & Cushion, 2006). One specific feature of coaching which may benefit from such a holistic mode of inquiry is the exploration of the pedagogical processes employed by coaches within the practice environment (Potrac et al., 2006). The beliefs of teachers and coaches are considered by scholars to perform a central role in the interpretation, selection, understanding and judgment of pedagogical behaviour (Tsangaridou, 2006) and represent a vital function in defining instructional tasks and organising the information and knowledge in relation to those tasks (Pajares, 1992; Calderhead, 1996; Borko, 2004; O'Sullivan, 2005; Tsangaridou, 2006). The concept of teachers' beliefs has been widely employed in the literature, and "on many occasions, in quite problematic ways" (Tsangaridou, 2006, p. 486). According to Ennis (1994) teachers' beliefs are more demanding to classify compared with factual knowledge as:

> An individual's beliefs often must be inferred from statements or actions. They reflect a tacit understanding of personal, social, or professional truths that have been constructed over time through enculturation, education, or schooling. (p. 164)

In referring to the concept of teachers' beliefs Pajares (1992) commented:

> Defining beliefs is at best a game of player's choice. They travel in disguise and often under alias – attitudes, values, judgements, axioms, opinions, ideology, perceptions, conceptions, conceptual systems, preconceptions, dispositions, implicit theories, explicit theories, personal theories, internal mental processes, action strategies, rules of practice, practical principles, perspectives, repertoires of understanding, and social strategy, to name but a few that can be found in the literature. (p. 309)

Researchers have indicated that a pronounced emphasis needs to be directed to the thoughts and beliefs of teachers in order to codify and understand the complexity of teaching (Borko and Putnam, 1996). Furthermore, redirecting research interests from pedagogical strategies and behaviours to the beliefs that motivate and define teachers' practice have been encouraged (Richardson, 1996). Correspondingly, Kirk (1989) has advocated the need for researchers to work with teachers rather than working on them. Lawson (1990) supports this notion by recognising the benefits and constraints of the quantitative paradigm and celebrates contemporary educational research endeavours that pursue the subjective beliefs and opinions of teachers. According to Rovegno (2003): "to understand good teaching, we need to hear teachers' voices and study what good teachers thought, knew, and believed" (p. 295). Requests for the exploration of the nature and function of teachers' beliefs have propagated educational literature (O'Sullivan, 1996; 2003; Wilson and Berne, 1999; Zeichner, 1999). In order to provide relevant education programs, educators require an understanding of the role of teachers' beliefs in an attempt to shape teachers' opinions of teaching and learning O'Sullivan (2003). In addition, the beliefs of teachers "serve as filters through which their learning takes place and they are critical targets and major determinants of changes in teaching practice" (Tsangararidou, 2006, p. 486). Despite the scholarly importance of the beliefs of teachers and coaches, only a limited number of studies to date have examined this complex issue. Notwithstanding general research endeavours involving primary teachers in Physical Education and small cohorts of elite soccer coaches (Tsangaridou, 2008; Partington & Cushion, 2011; Smith & Cushion, 2006; Potrac et al., 2002) no research has yet specifically described Australian tennis coaches' insights and practices with regard to the teaching styles they employ during coaching sessions. Some scholars are also unwavering in their support of the employment of interviews. It is posited that the employment of interviews when investigating a coach's behaviour is fundamental to the comprehension of why coaches behave in certain ways. Additional, interviews were employed to investigate the attitudes, beliefs and values of an elite English soccer coach's instructional behaviour within the practice environment (Potrac et al., 2002).

Despite research in relation to the characteristics of effective teaching and coaching (Brophy & Good, 1986; Medley 1977; Medley, 1979) few scholars have considered the respective definitions and interpretations that practitioners attribute to effective instruction. As far back as the 1970s Fenstermacher (1978) suggested that the perceptions of teachers' instructional effectiveness ultimately presents a foundation for their actions, and recommended that researchers learn more about the subjective beliefs of teachers. Similarly, Fang (1996) described the beliefs that teachers and coaches possess as the "rich store of general knowledge of objects,

people, events and their relationships that teachers have which influence their planning decisions as well as their classroom actions (p. 50). It is commonly assumed that the construct of beliefs is a global notion that generates multiple interpretations (Tsangaridou, 2006). Recent empirical study in the discipline of sports coaching has also recognised the value and significance of exploring the insights that underpin practice (Smith & Cushion, 2006; Potrac et al., 2002; Partington & Cushion, 2011).

The vast majority of this research has been explored through quantitative description. While such inquiry has produced worthwhile knowledge with regard to the pedagogical practices utilised by coaching practitioners in training and competition, it has neglected to extend an insight into the social and contextual factors that underpin, and impose upon, coach behaviour (Cote, Salmela & Russell, 1995a; Cote, Salmela & Russell, 1995b; Kahan, 1999; Potrac, Brewer, Jones, Armour & Hoff, 2000). In discussing these contextual influences associated with coaching behaviour, van der Mars (1989) indicated that in order to generate a greater understanding of such behaviour, the quantitative data obtained from observation instrumentation should be analysed "in light of the situations in which they were observed" (p. 9). However, the available literature has largely ignored this conception. This limitation is of significance when it is considered in the context of contemporary discourse about coaching. This dialogue has indicated that effective coaches are those who have the capacity to adapt their instructional practices to meet the distinctive demands of the environment (Jones, Housner, Kornspan, 1997a; Jones, Housner & Kornspan, 1995; Jones, 1997b; Lyle, 1999; Potrac et al., 2000; Woodman, 1993). As a consequence, it would appear that it is not only imperative to determine the teaching styles of practitioners, but also to reflect upon the suitability of these teaching styles in developing desired outcomes. These insights may contribute to identifying and understanding effective coaching conduct (Tinning, 1988). In order to achieve these goals, it has been advocated that the observation of coaches should be ensued by reflexive interviews and/or participant observation work (Potrac & Jones, 1999; Potrac et al., 2000). It has been asserted that these methods are not limited to enabling a more comprehensive understanding of the multidimensional interactions involved in the dynamic coaching process (Lyle & Cushion, 2010; Potrac et al., 2000).The additional benefits of utilising these methods of inquiry consist of gaining an awareness of the contexts in which coaches act, and the effect these contexts consume upon their respective pedagogical behaviours (Strean, 1998).

To impact the practice and behaviour of coaches requires that they acknowledge what they do, in addition to the assumptions that support and inform their coaching (Harvey et al., 2010). Similarly, Light (2008) posits that it is crucial to have an awareness of the assumptions about learning. This is vital in elevating "coach self-awareness, a quality that the evidence suggests is lacking, but seems essential if coaches are to grasp the implications (good or bad) of their behaviour" (Lyle & Cushion, 2010, p. 51). This, however, is a challenging process further confused by the assertion that coaches often have a low self-awareness (Smith & Smoll, 2006). For that reason, research that explores the underlying assumptions and explanations of practice proposes an avenue for practitioners to contest their practice and move from a "practice 'comfort zone', and open up to self-reflection" (Partington & Cushion, 2011, p. 2). According to Cushion (2010) this will enable a more lucid connection between coach behaviour, practice, and context, in addition to the player's development and particular needs.

Despite the fact that coaches may not necessarily have the capacity to articulate their beliefs in connection with teaching, their practice customarily lies with fundamental and often unchallenged views about learning (Light, 2008). As previously mentioned, all coaching is "based upon some theory about how we learn" (Lyle & Cushion, 2010, p. 51). Epistemology can be defined as "questions about the nature of knowledge and the relationship between the inquirer and the known" (Lyle & Cushion, 2010, p. 51). Epistemological suppositions govern the notion of "whether knowledge is something which can be acquired on the one hand or something which has to be personally experienced on the other" (Burrell & Morgan, 1979, p. 2, as cited in Sparkes, 1992). Epistemologically speaking, a behaviourist belief makes the assumption that knowledge is objective, readily accessible and "filtering or internalizing objective knowledge requires a highly structured and technical pedagogical approach" (Lyle & Cushion, 2010, p. 51). The delivery of highly prescribed direct instruction is often associated with this type of learning. Recent advances in coaching research and coach education, however, have been inclined to endorse a more constructivist epistemology. In this view, knowledge is presumed to be socially constructed via interaction and collaboration and must be experienced as opposed to acquired (Cassidy et al., 2009; Cushion, 2006). According to Lyle and Cushion (2010) this approach "emphasizes the coach's facilitative behaviour not instructing per se but constructing experiences for athletes" (p. 51). This type of learning is commonly linked to indirect instruction that supports the delivery of content and information in a less prescribed manner.

To date, however, only a limited number of studies have implemented observations and interviews to investigate coaching behaviour. In 2002, Potrac and colleagues conducted a study that primarily addressed coaching practice from a sociological perspective. The research employed observations and interviews to identify the pedagogical behaviours used by one top-level English football coach. A mixed method approach was used to not only identify the pedagogical behaviours used by the participant in the practice environment, but also to generate an in-depth insight into the rationales that underpinned their use. In this study it was suggested that the subject's coaching practice was influenced by his perceived need to establish a strong social bond between himself and his players – a bond founded on the players' respect for his professional knowledge and personal manner.

Another study that employed observation and interviews to specifically investigate the instructional practices of coaches was conducted by Smith and Cushion (2006). The aim of this study was to investigate the working behaviours of six top-level professional English youth coaches. Results revealed a conscious pattern of behaviour and silent monitoring, interspersed with instruction, praise and encouragement. The interviews uncovered three themes underpinning this behaviour including: developing game understanding, support and encouragement, and coaches' role and influences. The use of silence was the largest single behaviour, the value of which was considered in the context of theories of experiential and discovery learning. The coaches' use of direct instruction was limited and employed far less frequently compared with alternative instruction strategies, such as silent monitoring.

Ford, Yates and Williams (2010) observed the practice activities and instructional behaviours employed by 25 youth soccer coaches during 70 different practices sessions. The results of the observations revealed that coaches had players spend more time in activities that were deemed less relevant to soccer match

performance (‘training form’) than activities deemed more relevant (‘playing form’). This study also revealed that coaches provided high levels of instruction, feedback, and management, regardless of the activity in which players engaged. Limited differences in practice activities and instructional behaviours were reported across skill and age groups, suggesting the absence of any noteworthy age or skill related progressions.

Most recently, Partington and Cushion (2011) explored the practice activities and coaching behaviours of 11 professional top-level youth soccer coaches using observations and interviews. The aim of this study was to investigate the coaches’ behaviours in different practice settings as well as gaining an understanding into the coaches’ insights that underpinned these behaviours. The practice setting was split into two types of activities, ‘training form’ and ‘playing form’. The findings showed the coaches implementing ‘training form’ activities more frequently than ‘playing form’ activities. Additionally, the coaches employed high levels of direct instruction. The interviews also suggested that the coaches lacked a degree of self-awareness about their behaviour.

The majority of research concerning the instructional behaviours of sports coaches has been conducted in North America and the United Kingdom with elite professional youth soccer coaches. Behaviours of non-elite coaches and more specifically tennis coaches, remains under-researched. Currently, little is known about the coaching behaviours of Junior Development (beginning coaches) and Club Professional (intermediate to advanced coaches) youth tennis coaches in Australia. It could be argued that the demands, pressures and goals of beginner and intermediate to advanced tennis coaches are quite different to those of an elite level (Cushion & Jones, 2001). Considering this, the descriptions of non-elite coaches’ behaviour during coaching sessions are required.

2.25 Conclusion

In spite of extensive explorations emanating from various empirical and theoretical perspectives, much remains unknown in relation to coaching and instructional practices, positive or negative, across an array of sports (Lyle, 2002; Mallett, 2005; Armour & Jones, 2006; Potrac et al., 2007). Much has been written about the various teaching styles available for sports coaches to employ during coaching sessions (Lyle & Cushion, 2010). Literature has also revealed significant progress in expanding our awareness of motor skill learning and the kinds of instructional practices that most effectively develop players (Farrow et al., 2008; Williams & Hodges, 2004, 2005). In addition to this, it is strongly advocated that an effective coach should “tailor their content and instruction to the specific learning readiness and interests of their students, by integrating concepts and implementing teaching strategies that are responsive to the students’ diverse needs” (Cushion, 2010, p. 52). Few published accounts, however, have reported on *how*, *why* or indeed *whether* sports coaches consider these pedagogical principles during coaching sessions. Traditionally, the educational association between coach and player has been primarily direct and prescriptive (Miller, 1992; Millard, 1996; Kahan, 1999; Cushion & Jones, 2001; Jones, 2006; Potrac et al., 2007; Ford et al., 2010; Cushion & Partington, 2011).

Despite the general quantity of behavioural research, the ability to derive consequential comparison appears narrow. Therefore, we cannot casually assert the transfer of research findings from one context to another (Cushion, 2010; Harvey et al., 2010). In addition, coaching behaviours have tended to be largely explored in isolation (Ford et al., 2010). For this reason, research that considers "what coaches do and why they do it, still offers much in developing our understanding about coaching" (Cushion, 2010, p. 44).

As diverse learning conditions and experiences are often created by employing different teaching styles, the necessity for tennis coaches to understand and purposefully implement a variety of teaching styles to achieve learning outcomes has been recommended. Additionally, tennis involves learning aims and objectives from the psychomotor (physical/motor skill), cognitive (decision making), and affective (enjoyment/motivation) domains. This might indicate the application of specific teaching styles to comprehensively develop each learning area. As no one teaching style encompasses all learning eventualities, the capability to change, combine and transition between various instructional practices during sessions would appear highly desirable. It is currently unknown what teaching styles tennis coaches are employing during coaching sessions and whether these teaching styles are associated with recommended pedagogical principles advocated by scholars.

In consideration of the numerous points mentioned, further research, regarding the employment of teaching styles, is significant and valuable. The objective of this research initiative was to explore through the employment of a survey questionnaire, observations and interviews, empirical evidence of the teaching styles that tennis coaches implement during coaching sessions and their insights that underpin these practices. The literature review demonstrates that *The Spectrum* (Mosston & Ashworth, 2008) is a relevant and appropriate theoretical framework to identify the teaching styles of tennis coaches in this study.

This research will contribute to the current body of literature pertaining to the employment of teaching styles and tennis coaching. It is anticipated that it will also provide valuable insights about coaches' views, understandings and interpretations that underpin their instructional practices during coaching sessions. The recognition of various aspects of the pedagogical behaviour of tennis coaches in Australia is especially critical in the design of coach education programs and professional development initiatives. The significance of this study has international implications and applicability especially in the context of tennis coaching and may provide relevance into sports coaching and pedagogy more broadly. To the researcher's knowledge, the study undertaken will be the first published endeavour to explore the teaching practices and insights of tennis coaches. In doing so, it is expected to provide relevant information towards realising a more thorough comprehension of the coaching behaviours and insights of tennis coaches in Australia.

The specific research questions guiding this study include:

1. What teaching styles do Junior Development (JD) and Club Professional (CP) tennis coaches in Australia believe they are using during coaching sessions throughout the year?

2. What teaching styles are Junior Development (JD) and Club Professional (CP) tennis coaches in Australia actually using during coaching sessions?

3. What are the coaches' insights of the teaching styles they employ during coaching sessions?

CHAPTER THREE: METHODOLOGY

Chapter Three provides an outline of the research design, methods, procedures and stages of data collection and analysis employed in this study. Somekh and Lewin (2005) describe methodology as both "the collection of methods or rules by which a particular piece of research is undertaken and the principles, theories and values that underpin a particular approach to research" (p. 346). Walter (2006) extends this explanation and asserts that methodology is the framework or orientation for the research prompted by the "paradigm in which our theoretical perspective is placed or developed" (p. 35). In this way, the identification and explanation of an appropriate paradigm, worldview or philosophical assumption is a crucial precursor to selecting the research design, research methods and junctures of data collection and analysis for the study (Creswell, 2012).

This chapter will detail the theoretical assumptions and perspectives that underpin the methodology, followed by an outline and rationale for the adopted research design employed in the study. A description of the methods adopted, in addition to a detailed account of the procedures, data collection and analysis are then presented.

3.1 Paradigms, world views and philosophical assumptions

It has been asserted that the "exact nature of the definition of research is influenced by the researcher's theoretical framework" (Mertens, 2005, p. 2) with theory being employed to "establish relationships between or among constructs that describe or explain a phenomenon by going beyond the local event and trying to connect it with similar events" (Mertens, 2005, p. 2). This theoretical framework, as dissimilar from a theory, is also presented as a paradigm (Mertens, 2005; Bogdan & Biklen, 1998), worldview or philosophical assumption (Creswell & Clarke, 2011) and serves to inspire the way knowledge is examined and interpreted. According to Mackenzie and Knipe (2006), "it is the choice of paradigm that sets down the intent, motivation and expectations for the research" (p. 194). Without acknowledging a paradigm in the initial stages of conducting research, there may be no foundation for ensuing choices with regard to methodology, methods, or research design (Mackenzie & Knipe, 2006). Bogdan and Biklen (1998) refer to the term 'paradigm' as "a loose collection of logically related assumptions, concepts, or propositions that orientate thinking and research" (p. 22), while Cohen and Manion (1994) define paradigm as "the philosophical intent or motivation for undertaking a study" (p. 38). MacNaughton, Rolfe and Siraj-Blatchford (2001) explain it as "a belief about the nature of knowledge, a methodology and criteria for validity" (p. 32).

Literature has indicated that research, which applies to the positivist or postpositivist paradigm be disposed to the predominant application of quantitative methods for the collection of data and analysis, while the interpretivist or constructivist paradigm more commonly functions using primarily qualitative methods (Silverman, 2000; Wiersma, 2000; Bogdan & Biklen, 2003; Mertens, 2005; Cohen & Manion, 1994). A positivist or postpositivist viewpoint, usually referred to as the scientific method or science approach, is based on a rationalistic and empiricist philosophy. This paradigm "reflects a deterministic philosophy in which causes probably determine effects or outcomes" (Creswell, 2009, p. 7). Positivists aim to

test a theory or describe an experience "through observation and measurement in order to predict and control forces that surround us" (O'Leary, 2004, p. 5). Interpretivist or constructivist approaches focus on understanding "the world of human experience" (Cohen & Manion, 1994, p. 36) and show that "reality is socially constructed" (Mertens, 2005, p. 12). The interpretivist or constructivist researcher often employs "participants' views of the situation being studied" (Creswell, 2009, p. 8). The pragmatic paradigm offers the researcher an opportunity for "multiple methods, different world views, and different assumptions, as well as different forms of data collection and analysis in the mixed methods study" (Creswell, 2009, p. 199). Similarly, the transformative paradigm permits the implementation of both qualitative and quantitative research methods, while deconstructivist and poststructuralist research "seeks to understand the dynamics of relationships between the knowledge/meaning, power and identity" (MacNaughton et al., 2001, p. 46) employing collected and analysed data from qualitative methods. Some scholars have suggested that the paradigm and research question(s), should govern the research data collection and analysis methods (qualitative/quantitative or mixed methods) (Mackenzie & Knipe, 2006). The researcher's decision to implement a particular research design, research method and data collection and analysis may be based on what is deemed most appropriate and suitable for the specific study. While a combination of data collection methods may be employed during research, it is considered customary for a researcher to form a philosophical affiliation with a particular paradigm. Mertens (2005) suggests that a "researcher's theoretical orientation has implications for every decision made in the research process, including the choice of method" (p. 3).

3.1.1 The pragmatic paradigm

According to Johnson and Onwuegbuzie (2004) pragmatism is an "attractive philosophical partner for mixed methods research" (p. 14). The pragmatic paradigm affords a set of assumptions about knowledge and inquiry that undergirds a mixed methods approach, and which differentiates the approach from purely quantitative and qualitative approaches. Literature has presented a myriad of advantages for researchers engaged in the pragmatic paradigm. Most notably, it permits researchers to be adaptable in their investigative techniques. As noted by Johnson and Onwuegbuzie (2004):

> Combining quantitative and qualitative research helps to develop a conceptual framework, to validate quantitative findings by referring to information extracted from the qualitative phase of the study, and to construct indices from qualitative data that can be used to analyse quantitative data. Further, because quantitative research is typically motivated by the researcher's concerns, whereas qualitative research is often driven by a desire to capture the participants' voice, pragmatic researchers are able to merge these two concepts within a single investigation. (p. 384)

It has also been argued that pragmatic researchers who apply mixed methods research are able to explore and understand data more comprehensively by using one method to verify the results from another method (Johnson & Onwuegbuzie, 2006). The researcher, in this study, is guided by the pragmatic and bricolage approaches which are closely linked to the employment of

mixed methods research design (Creswell, 2009). Research as bricolage reflects what Gergen and Gergen (2000) labelled a postmodern "profusion of practices" (p. 167). According to Kincheloe and Berry (2004) these practices in bricolage include:

> Multiple theories and methodologies, multiple ways to collect, describe, construct, analyse, and interpret the object of the research study, and finally multiple ways to narrate (tell the story) about the relationships, struggles, conflicts, and complex world of the study that maintains the integrity and reality of the subject. (p. 90)

The research design, research methods, and data collection and analysis components that were undertaken in this study position a greater emphasis on the research questions than either the research methods or the underlying world view guiding those research methods. Typically, mixed methods research supports pluralism and converges on *what works* in gathering research data (Hammersley, 2000). Any data that can add to an understanding of the research questions should be considered. The researcher, as bricoleur, "exists out of respect for the complexity of the lived world" (Kincheloe & Berry, 2004, p. 2) and employs research practices depending on the questions posed. The questions are dependent on the context, what is available in that context, and what the researcher is able to achieve in that particular context. While this study is guided by pragmatic theoretical assumptions, the researcher also maintains "multiple paradigms may be used in mixed methods research; and researchers must simply be explicit in their use" (Creswell & Clarke, 2011, p. 45). This dialectical outlook acknowledges that different paradigms or world views may produce contradictory notions and theoretical disputes and that these "contradictions, tensions and oppositions reflect different ways of knowing about and valuing the social world" (Creswell & Clarke, 2011, p. 45). Therefore, this perspective emphasises the implementation of multiple world views during the study.

3.2 Research design

According to Creswell (2009) "research designs are plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis" (p. 3). Mixed methods research design is seen as "a procedure for collecting, analysing, and mixing both quantitative and qualitative methods in a single study or a series of studies to understand a research problem" (Creswell & Plano Clark, 2011, p. 102). Creswell (2009) believes that research approaches have become increasingly complex in design and significantly more adaptable in relation to their solicitation of methods, with mixed methods research becoming progressively commonplace and earning greater acceptability. Moreover, Creswell "gathering both numeric information (e.g., on instruments) as well as text information (e.g., on interviews) so that final database represents both quantitative and qualitative information" (p. 20).

Mixed methods research has been considered as a "key element in the improvement of social science, including education research" (Gorard & Taylor, 2004, p. 7) with research strengthened by the use of a variety of methods. Mertens (2005) submits that mixed methods research as a methodology is known for its ability to engage in multifaceted educational and social settings when exploring an

educational or social question. Another appealing feature of mixed methods research is the alignment and affinity it shares with "the political currency accorded to 'practical inquiry' that speaks to policy and policymakers and that informs practice" (Hammersley, 2000, p. 56).

3.2.1 Explanatory sequential fixed mixed methods research design

The primary purpose of this study was to report the teaching styles that JD and CP tennis coaches in Australia believe they employ during coaching sessions throughout the year, in addition to analysing the teaching styles that coaches actually use. *The Spectrum* (Mosston & Ashworth, 2008) was the theoretical teaching framework used as a basis for identification. The research questions relating to this component of the study were:

1. What teaching styles do Junior Development (JD) and Club Professional (CP) tennis coaches in Australia believe they are using during coaching sessions throughout the year?

2. What teaching styles are Junior Development (JD) and Club Professional (CP) tennis coaches in Australia actually using during coaching sessions?

A secondary objective of the research was to explore the views, understandings and interpretations of the teaching styles that JD and CP tennis coaches' in Australia employ during coaching sessions. This part of the study also explored some of the coaches' motivations that underpin the employment of teachings styles.

Consistent with the particular mixed methods research design employed in this study, the questions pertaining to the qualitative strand of the study were refined and finalised during the quantitative phase. Consequently, the research questions for the qualitative phase of the study depended on the quantitative findings and what they revealed. The research questions associated with this stage of the study was:

3. What are the coaches' insights of the teaching styles they employ during coaching sessions?

An explanatory sequential fixed mixed methods research design was chosen to seek answers to the research questions in this study. The vast majority of literature in relation to the implementation of mixed methods research designs has highlighted sequential approaches (Creswell & Clarke, 2011). An explanatory sequential design is a mixed methods design that comprises of first collecting quantitative data followed by the gathering of qualitative data to elaborate on or extend the quantitative findings. In support of employing this research design, Creswell and Clarke (2011) contend, "quantitative data and results provide a general picture of the research problem; more analysis, specifically through qualitative data collection, is needed to refine, extend, elaborate or explain the general picture" (p. 542). In this design, the researcher situates a priority on the quantitative data collection and analysis (Creswell & Clarke, 2011). This process will be completed by presenting it first in the study and having it exemplify a foremost feature of data collection. A smaller qualitative element will be introduced in the second phase. According to Creswell and Clarke (2011) mixed methods research designs is further identified as

fixed or *emergent.* The mixed methods employed in this study are classified as *fixed* as the quantitative and qualitative methods were predetermined and planned at the commencement of the research process and the procedures were employed as originally intended.

3.2.2 Procedure for implementing the research design

The study was undertaken in three stages. During the first stage, the researcher designed and implemented the quantitative strands of the study that consisted of collecting and analysing quantitative data. Following the analysis of the quantitative data, the researcher identified specific quantitative results that served to guide the development of the qualitative strand of the study. Specifically, in this stage, the researcher developed and refined the qualitative research questions and data collection protocols to follow on from the quantitative findings. In this sense, the qualitative phase of the study was determined and contingent on the quantitative results. The third stage consisted of the researcher implementing the qualitative phase by gathering and analysing qualitative data. In the final stage of this research design, the researcher interpreted the extent and in what ways the qualitative results provide insight into the quantitative results and ultimately what was learnt in response to the purpose of the study (Creswell & Clark, 2011).

3.2.3 Rationale and purpose of the research design

The general purpose of employing this research design was to use a qualitative strand to extend the findings emanating from the initial quantitative results. According to Creswell and Clark (2011) this research design is appropriate if the researcher wants to "form groups based on quantitative results and follow up with the groups through subsequent qualitative research or to use quantitative results about participant characteristics to guide purposeful sampling for a qualitative phase" (p. 82). The rationale for employing a mixed methods research design in this study was for the quantitative data and their consequent analysis to provide a general understanding and outline of the first two research questions. The following qualitative data and their analysis refined, elaborated and further explained those statistical findings in the quantitative phase of the study by exploring the coaches' insights in more depth (Creswell, 2003; Tashakkori & Teddlie, 2010). The concepts of *elaboration* or *expansion*, *corroboration*, *development* and *complementarity* (Brannen, 2005) provides a rationale for implementing a mixed methods approach in this study and to guide the researcher in combining the findings from the different data analyses as a result of implementing a mixed methods approach. The concept of *elaboration* or *expansion* refers to how one type of data analysis elaborates or expands the understanding of another. The concept of *development* describes the use of findings from one method to help inform other methods. The concept of *complementarity* views each type of data analysis as enhancing the other. The data analyses from the different methods are contrasted to produce complementary insights that generate greater depth and breadth in the study. The term *corroboration* refers to how each method represents a different perspective used to assess a given phenomenon in an attempt to increase the validity of the outcomes (Brannen, 2005). From this analysis a composite of JD and CP tennis coaches' practices and insights of teaching styles was developed.

3.3 Participants

Tennis Australia (TA) conducts three formal accreditation tennis coaching courses that form part of the National Coaching Accreditation Scheme (NCAS). Participants for this study were recruited from two of the accreditation coaching courses. The formal accreditation coaching courses used were the JD and CP courses. These two courses were chosen as they cater for different levels of coaching knowledge and experience. Participants enrolled in the JD course are largely inexperienced coaches with limited coaching knowledge who are commencing their coaching careers. Alternatively, the participants enrolled in the CP course are expected to possess a greater degree of coaching knowledge and experience. Recruiting coaches from different formal accreditation tennis coaching courses offered a broader perspective of insights into the participants' teaching styles that are employed during coaching sessions throughout the year. All coaches enrolled in the JD and CP coaching courses in Australia between 2009 and 2011 were invited to participate in **Stage 1** (survey questionnaire), **Stage 2** (observation) and **Stage 3** (interview) of the study.

A total of 208 tennis coaches enrolled in the JD accreditation tennis coaching course (n=130) and the CP accreditation tennis coaching course (n=78) between the later part of 2009 through to the end of 2011 agreed to participate in **Stage 1** (survey questionnaire) of the study. A total of 171 respondents were male and 37 were female. The mean age for the respondents completing the JD (n=130) and CP (n=78) formal accreditation tennis coaching programs was 23 years and 31 years respectively. The mean age of the total sample (n=208) was 27 years.

Of the 208 coaches who participated in **Stage 1** of the research, a total of 56 volunteered to be involved in **Stage 2** (observation) and **Stage 3** (interview) of the study. From the 56 participants who volunteered, 37 were coaches enrolled in the JD accreditation course and 19 in the CP accreditation course. Twenty of the JD coaches were from Victoria (VIC), ten were from New South Wales (NSW), and seven were from Queensland (QLD). Fifteen of the CP coaches came from VIC, and four came from NSW. Of the 56 coaches who volunteered to participate in **Stage 2** and **Stage 3** of the study, 13 coaches were chosen. From this group, 12 coaches were selected to participate in three 30 minute observations during their accreditation coaching course. In order to obtain an assessment of teaching styles usage over an extended period of time, one additional coach was chosen to participate in 18 hours of observations over a six-day period at their place of work. Overall, 13 coaches were involved in **Stage 2** and **Stage 3** of the research. The characteristics of the group of 12 coaches selected for the three 30 minute observations were:

- Female JD coach from VIC (0-3 years coaching, 15-19 years old, mostly coaches 4-5 age group, mostly coaches beginner players).
- Female JD coach from NSW (4-10 years coaching, 30-39 years old, mostly coaches 9-11 age group, mostly coaches intermediate players).
- Male JD coach from VIC (0-3 years coaching, 20-29 years old, mostly coaches 6-8 age group, mostly coaches beginner players).
- Male JD coach from NSW (4-10 years coaching, 50+, mostly coaches 4-5 age group, mostly coaches beginner players).
- Female JD coach from QLD (0-3 years coaching, 30-39 years old, mostly

coaches 6-8 age group, mostly coaches beginner players).
- Male JD coach from QLD (0-3 years coaching, 15-19 years old, mostly coaches 9-11 age group, mostly coaches beginner players).
- Female CP coach from VIC (4-10 years of coaching, 20-29 years old, mostly coaches 9-11 age group, mostly coaches intermediate players).
- Male CP coach from VIC (11-20 years of coaching, 30-39 years old, mostly coaches 4-5 age group, mostly coaches beginner players).
- Male CP coach from VIC (20+ years coaching, 40-49 years old, mostly coaches 18+ age group, mostly coaches intermediate players).
- Female CP coach from NSW (4-10 years of coaching, 20-29 years old, mostly coaches 12-14 age group, mostly coaches intermediate players).
- Male CP coach from NSW (4-10 years of coaching, 30-39 years old, mostly coaches 15-17 age group, mostly coaches advanced players).
- Female CP coach from QLD (4-10 years of coaching, 20-29 years old, mostly coaches 9-11 age group, mostly coaches intermediate players).

The characteristics of the single coach who was chosen to participate in the extended observational period of 18 hours over a six-day period were:

- Male JD coach from VIC (0-3 years coaching, 20-29 years old, mostly coaches 6-8 age group, mostly coaches beginner players).

3.4 Justification of the sample

The rationalisation for the selected sample size of 208 participants for **Stage 1** of the study (survey questionnaire) and 13 participants for **Stage 2** (observation) and **Stage 3** (interview) of the study will be now discussed. In addressing research questions, a researcher must engage in a sampling procedure that involves "determining the location or site for the research, the participants who will provide data in the study and how they will be sampled, the number of participants needed to answer the research questions, and the recruitment procedures for participants" (Creswell & Clark, 2011, p. 172). These sampling procedures are applicable to both the quantitative (**Stage 1** – survey questionnaire) and qualitative (**Stage 2** – observations and interviews) components associated with this research. Differences in how they were adopted, particularly in relation to the sampling approach and size were evident.

For the quantitative component of this study (**Stage 1** – survey questionnaire) the researcher employed a nonprobalistic sampling procedure. Nonprobalistic sampling involves "selecting individuals who are available and can be studied" (Creswell & Clark, 2011, p. 174). In the case of the current study, the researcher invited all the coaches who enrolled in the JD and CP coach accreditation courses between 2009 and the latter part of 2011. Therefore, the sample size for the survey questionnaire was representative of all coaches in Australia that were enrolled in the JD and CP formal coach accreditation courses at the time of the study. However, it is not representative of all coaches enrolled in alternative accreditation coaching courses offered by Tennis Australia, or of the entire population of tennis coaches in Australia. According to Creswell and Clark (2011) the sample size required for a thorough quantitative study is reasonably large. In spite of this limitation, the researcher was still able to invite the entire population of tennis

coaches in Australia who enrolled in the JD and CP accreditation coaching courses between 2009 and the latter part of 2011. From this sample size (n=208) a remarkable response rate of 100% was achieved. This remarkable outcome is perhaps largely due to two factors. The assistance provided by Tennis Australia and the various CDCs ensured that the participants were afforded time during the accreditation course hours to complete the survey. Furthermore, the material canvassed in the survey questionnaire closely related to the course objectives and outcomes. As a result, the participants were perhaps eager to engage with the subject matter presented in the survey questionnaires. However, since the survey questionnaires were distributed and completed during the course, it is acknowledged that the participants may have felt obliged to participate, thereby resulting in the notable response rate.

For **Stage 2** (observations) and **Stage 3** (interviews) of the study, the researcher employed purposive or theoretical sampling. This form of sampling means that "researchers intentionally select (or recruit) participants who have experienced the central phenomenon or the key concept being explored in the study" (Creswell & Clark, 2011, p. 173). According to Creswell (2008) there are numerous purposeful sampling approaches offered. The purposeful strategy employed in this part of the study was maximal variation sampling (Creswell & Clark, 2011). This strategy stipulates how "diverse individuals are chosen who are expected to hold different perspectives on the central phenomenon" (Creswell & Clark, 2011, p. 174). The fundamental notion of this particular strategy is that if "participants purposefully chosen to be different in the first place, then their views will reflect the difference and provide a good study in which the intent is to provide a complex picture of the phenomenon" (Creswell & Clark, 2011, p. 174). The criteria related to maximising differences is dependent on the individual study (Creswell & Clark, 2011). Previous research on coaching, has used a combination of several criteria to select participants for research, including: (a) number of years of coaching experience, (b) the performance levels of the students they coach, and (c) description of recognised qualifications and skills (Cote et al., 1995a; Saury & Durand, 1998; Smith & Cushion, 2006). Similarly, prior research that has investigated Physical Education teachers' usage of teaching styles has employed additional criteria in the selection of respondents for their research (Jaakola & Watt, 2011; SueSee, 2012; Kulinna & Cothran, 2003) These entail: (a) gender, (b) teaching experience, (c) level of education, (d) school level teaching, and (e) average class size. Following on from this work, the criteria for maximising difference among the tennis coaches selected for this component of the study included the following:

- Gender.
- Age.
- State or territory in Australia where they coach.
- Coaching experience (years of coaching).
- Age groups most time spent coaching.
- Levels most time spent coaching.

According to Berg and Latin (2004) it is appropriate for researchers to "use their special knowledge or expertise about some groups to select subjects who represent the population" (p. 32). The researcher is a qualified Physical Education teacher, has a Master of Education, and has been a tennis coach for over 20 years,

with coaching experiences ranging from beginner to high performance players across age levels ranging from three years to 89 years of age. The researcher has additional experience as an educational consultant for Tennis Australia that entails developing coaching course curriculum as well as presenting and lecturing this content in Tennis Australia's accreditation coaching courses. This knowledge and experience has afforded the researcher with a capacity to select the appropriate characteristics that a variety of JD and CP tennis coaches may exhibit.

While observing and interviewing a larger number of coaches may have provided the study with more depth and breadth, the proposed sample size is considered an appropriate number to achieve the aims within the given time frame. As Berg and Latin (2004) propose, "students or researchers on restricted budgets may have to make compromises in sample size and statistical power" (p. 201). The interview component of the study relied on shared, heuristic knowledge of those involved. According to Keeves and Sowden (1997) in the interest of seeking detailed reporting of interpretive data, fewer respondents are better. Therefore, 13 participants were considered an appropriate number for this part of the study.

In an attempt to minimise the risk of attrition of the participants in this study, a variety of procedures were employed. All coaches who agreed to participate in the survey questionnaire were provided with sufficient time during their respective accreditation coaching courses to complete the survey. This eliminated issues associated with imposing on the participants' personal time. In an effort to stress the importance of the research, encourage maximum participation, and answer any questions, the researcher personally attended the coaching courses scheduled for Victoria. For courses conducted in the other states, the Coach Development Coordinators (CDC) in each state were briefed by the researcher about the study in an effort to assist in answering any questions. Additionally, all the coaches who were chosen to participate in **Stage 2** (observation) and **Stage 3** (interview) were contacted by the researcher to confirm their willingness to participate in the study and to answer any questions. The researcher also used this opportunity to organise a suitable time to conduct the interview. Prior to the arranged time of the interview an email and telephone communication was initiated by the researcher in order to confirm the venue and time.

3.5 Research methods

Crotty (1998) describes research methods as "the techniques or procedures used to gather and analyse data related to some research question or hypothesis" (p. 3). The research methods employed in this study were judiciously selected to safeguard consistency with the research design in addition to the theoretical assumptions that underpin the research project. Of utmost importance, however, in selecting the research methods for this study was the desire to attend to the research questions.

This study proposes to employ three research methods (survey questionnaires, observations and interviews), to explore and analyse the practices and insights of tennis coaches in Australia in relation to the teaching styles they use during coaching sessions. **Stage 1** of the study consisted of a survey questionnaire. The survey questionnaire reported the teaching styles that tennis coaches' believe

they used during coaching sessions throughout the year. From the survey questionnaire, 56 coaches volunteered to participate in **Stage 2** (observations) and **Stage 3** (interviews) of the study. From this group, 13 coaches were selected for the next stage. The observation stage of the study was implemented to assess the level of congruence between the teaching styles the coaches believed they used and what they actually used during coaching sessions throughout the year. **Stage 3** (interviews) explored the coaches' insights of teaching styles in addition to the motivations that inform their decisions to employ particular teaching styles during coaching sessions. It was anticipated that self-report survey questionnaires, observations and interview techniques would result in the creation of data whereby the qualitative findings further illuminated the meaning of the quantitative research techniques. In fact, it was hoped that this fusion of research methods would more precisely focus on the entirety of coaches' behaviour and insights by revealing the multidimensional and intricate level exchanges and interactions that epitomise the everyday and complex reality of the dynamic coaching process confronting JD and CP tennis coaches in Australia.

3.5.1 Stage 1: Survey questionnaire

The survey questionnaire used an adapted *description inventory of landmark teaching styles* (Hewitt, Edwards, & Ashworth, 2011) (**Appendix A**) of Ashworth's (2010) *Description inventory of landmark teaching styles: A spectrum approach* (United States) and SueSee, Ashworth, and Edwards (2007). *Instrument for collecting teachers' beliefs about their teaching styles used in Physical Education: Adaptation of description inventory of landmark teaching styles: A spectrum approach* (Brisbane, Australia). The *description inventory of landmark teaching styles* provides a *scenario description* of each of the 11 teaching styles. These *scenario descriptions* provide unequivocal descriptions that closely portray the image of each of the 11 teaching styles (Mosston & Ashworth, 2008). The adaptations employed to the *description inventory of landmark teaching styles* used in this study were implemented to more directly connect to the field of coaching. Written or verbal permission to employ the necessary changes to the descriptors was granted by Prof. Sara Ashworth, Associate Prof. Ken Edwards and Dr. Brendan SueSee. The survey questionnaire instrument developed by Hewitt, Edwards, and Ashworth (2011) is published on *The Spectrum of Teaching Styles* website (www.spectrumofteachingstyles.org/). This document is titled, *Instrument for collecting coaches' self-identified beliefs in relation to the teaching styles they use during coaching sessions throughout the year* (Hewitt et al., 2011).

The decision to employ a survey questionnaire served *four* purposes in this study. Initially, it provided descriptive data relating to the teaching styles tennis coaches believe they are using during coaching sessions throughout the year. Furthermore, it provided descriptive data relating to the coaches' teaching habits in addition to socio-demographic details of the coaches. The survey questionnaire also identified volunteers for the observations and interviews. As mentioned previously, from the 208 coaches who participated in **Stage 1** (survey questionnaire) 56 volunteered to be involved in **Stage 2** (observations) and **Stage 3** (interviews). From this group, 13 coaches were chosen. **Stage 1** of the research also provided descriptive data with which to compare the results of the survey questionnaires, observations and interviews, thereby enhancing the overall analysis and conclusions of the proposed study. The observations were a critical aspect of the study with regard to accurately

assessing the coaches' instructional practices. According to Ashworth: "without video or actual observation it is very difficult to determine the degree of accuracy of the coaches' teaching behaviours" (S. Ashworth, personal communication, March 2, 2010).

Creswell (2012) indicates that survey questionnaires are a valuable method of data collection when attempting to encapsulate a large number of responses as a sample of a population. The implementation of a survey questionnaire is further corroborated by Berg and Latin (2004) who assert that surveys are "designed to measure practices, opinions, or other such variables" (p. 199). Moreover, a distinctive feature of surveys is that, "rather than the researcher observing a particular behaviour the subject reports it" (Berg & Latin, 2004, p. 199). According to van der Mars (1989), however, the limitations of research methods such as survey questionnaires "lie in their lack of objectivity, reliability and specificity" (p. 76). He further argues that data obtained from such techniques "are primarily reflections of the observer's opinions about certain events that were seen. Such opinions are based on the observer's personal biases and history of experiences, and consequently the resulting record may reflect what the observer wanted to see rather than what happened" (p. 76). However, it has been postulated that the implementation of survey questionnaires do serve as useful measures of self-perception which may function a precursors of choice (Potrac et al., 2000). Similarly, since the late 1970s, literature has encouraged researchers to explore the perceptions of coaches and teachers. According to Fenstermacher (1978), coaches' and teachers' perceptions of their own effectiveness will ultimately provide a basis for their actions and as such, research should in fact be targeted at discovering more about the subjective beliefs of educators.

The survey questionnaire consisted of two parts. **Part A** posed questions relating to socio-demographic information in addition to coaching habits. These questions included: gender, age, and state or territory where you currently coach, highest educational qualification, coaching qualification that you are currently completing, how many years you have been coaching, how many hours a week you coach, the age group that you spend most time coaching, and the level/standard of the students you coach. **Part B** of the survey questionnaire then presented one question relating to the *description inventory of landmark teaching styles*. The question (for each of the 11 landmark teaching styles for which a description was provided) was: *'How frequently do I use this landmark teaching style in my coaching sessions throughout the year?'* A five-point rating scale was used for participant ratings. The items used for the question consisted of: *not at all, minimally, here and there, often, and most of the time* (**Figure 3.1**).

Landmark Teaching Style	Scenario Description of Landmark Teaching Style				
A	The students perform the task, selected by the coach, in a unison, choreographed, or precision performance image following the exact pacing (cues) set by the coach.				
How frequently do I use this landmark teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	(4)	5

Figure 3.1: An example of one scenario description from the description inventory of landmark teaching styles which shows a five-point rating scale used to measure how frequently a landmark teaching style was used (Hewitt, Ashworth & Edwards, 2010).

3.5.1.1 Pilot study: Survey questionnaire

According to Gratton and Jones (2010) it is crucial to employ a pilot questionnaire to enable the researcher to assess the sequence of questions, the administration of the questionnaire as well as analyse the results to confirm that the data is appropriate for the research endeavour. To assess the effectiveness and *comprehensibility* of the survey questionnaire a pilot study was conducted with 50 tennis coaches in March 2010. Thirty coaches were recruited from four different accreditation coaching courses conducted by Tennis Australia (TA). A further 20 coaches were recruited from the National Coaches Conference held in Melbourne in January 2010. The coaches were asked to complete the survey and to provide comment on any problems they encountered in relation to ease of use, wording, presentation and instructions or any other aspect they deemed relevant.

Two different versions of the survey questionnaire were distributed to explore the potential for order bias with the scenario descriptions presented in **Part B** of the survey questionnaire. The teaching style scenario descriptions were presented in an ordered fashion for the 11 landmark teaching styles (teaching styles A-K) in 25 survey questionnaires and in a random fashion in the remaining 25 surveys. Results indicated no significant difference between the random and ordered versions of the survey. These results suggest that either version of the survey questionnaire could be used in the larger study. However, given that significantly more tennis coaches would be involved in the larger study, it was decided that the survey questionnaire that presents the teaching style scenario descriptions in a random manner would be employed. This was decided as a measure to alleviate the possibility of order bias with the scenario descriptions in the larger study and to maximise the validity of the research findings.

The coaches' reported no major difficulties in completing the survey. Some respondents (n=10) however, questioned whether the wording in relation to certain teaching style descriptions could be changed to relate more specifically to tennis coaching. Others (n=5), remarked on whether the information included in some of

the teaching style scenario descriptions was relevant or necessary. As a result of this feedback the researcher contacted Prof. Sara Ashworth, the creator of the *Description inventory of landmark teaching styles: A Spectrum approach* (2010) and co-creator of *The Spectrum of Teaching Styles Description Inventory* (2007) and asked whether some of the changes could be made. Following a number of email communications with Prof. Sara Ashworth, and lengthy discussion with my principal doctoral supervisor (Associate. Prof. Ken Edwards) minor modifications were made to some of the inventory descriptions that more closely related them to tennis coaches. An example of one of these email exchanges pertaining to modifying *The Spectrum of Teaching Styles Description Inventory* (2007) is provided below. Prof. Sara Ashworth's comments are represented in bold text.

> Hello Sara
> Would it be possible, at your earliest convenience, to take a look at my survey ... again! This time I have included the changes to some of the wording, and omitted some things that you recommended from our previous discussions. **I have made tiny suggestions here and there … because I know others will use this questionnaire, it is worth the time to make these corrections**.
>
> One other thing Sara, now that this inventory is slightly different from the 2010 version (current web version) and also different form Brendan's (2007) could you guide me in how I should reference it. **Although the questionnaires are essentially the same, you do have a few wording differences and that does need to be acknowledged. I will send you wording for an adapted version**.
>
> Sorry! I had one more question. The word *teacher* is currently used in the descriptors. What are your thoughts on the possibility of replacing this word with coach. **This change is very appropriate. Your study focus is coaching, therefore, that word change is necessary.** The word teacher is often associated with the school environment whereas the word coach may better embrace and relate to the population I am attempting to engage with. References in the tennis fraternity, and other sports for that matter, are commonly made about tennis coaches and never tennis teachers (S. Ashworth, personal communication, March 16, 2010).

3.5.1.2 Survey questionnaire procedures

As earlier outlined, all coaches that were enrolled in the JD and CP coaching courses between 2009 and 2011 were invited to participate in **Stage 1** of the study – the survey questionnaire – in addition to **Stage 2** (observations) and **Stage 3** (interviews) of the study. A total of 208 tennis coaches enrolled in the JD formal accreditation tennis coaching program (n=130) and the CP formal accreditation tennis coaching program (n=78) between the later part of 2009 through to the end of 2011 completed the survey questionnaire. The survey questionnaires were distributed to the participants via their local Coach Development Coordinator (CDC). As the researcher resides in the State of Victoria, it was possible to attend the first day of the coaching courses that were conducted in Victoria to distribute and collect the completed survey questionnaires. For the courses that were conducted interstate,

surveys were emailed to each (CDC), who then invited the coaches to participate in the study. All coaches who agreed to participate in the study were provided with: (a) formal letter of invitation and plain language statement, and (b) the survey questionnaire. All the completed surveys from coaches in Victoria were collected by the researcher. The completed surveys from interstate were collected by the CDCs from that state and then posted to the researcher.

3.5.1.3 Data analysis

SPSS (Statistical Package for the Social Sciences) version 20.0 was used to perform analyses on the survey questionnaire variables. The survey questionnaire consisted of two parts. **Part A** of the survey questionnaire provided insightful descriptive information about the coaches with regard to earlier socio-demographic details and coaching habits. The specific areas included:

- Gender.
- Age
- State or territory where the coaches currently coach.
- Highest educational qualification.
- Coaching qualification that coaches are currently completing.
- Level of players that the coaches spent most time coaching per week.
- The age group of players that the coaches spent most time coaching per week.
- The number of years that coaches have been coaching.
- The number of hours the coaches spent coaching per week.

These items in the survey questionnaire were analysed using descriptive statistics that consisted of frequencies and percentages. **Part B** of the survey questionnaire presented one question relating to the *description inventory of landmark teaching styles.* The question was: *'How frequently do I use this teaching style in my coaching sessions throughout the year?'* Descriptive statistics including: percentages, frequencies, means, medians, and interquartile range were calculated to analyse the question in **Part B** of the survey questionnaire.

In addition to these descriptive statistics, one-way analysis of variance (ANOVA) was used to explore differences in mean responses by CP and JD coaches about their self-reported usage of teaching styles during coaching sessions throughout the year. Non-parametric Mann Whitney tests were conducted to test for differences between medians. One-way analysis of variance (ANOVA) and post-hoc LSD tests were additionally employed to explore the differences in mean responses from all the coaches as a single group (n=208) with regard to their self-reported usage of teaching styles and:

- Level of players the coaches spent most time coaching per week.
- Age group most time spent coaching per week.
- Hours of coaching spent per week.
- Years of coaching experience.

In order to determine whether there was a significant association between coaching qualification and hours of coaching, level of students the coaches spent most time coaching, years of coaching and the age group the coaches spent most time coaching, Chi-square tests were performed. The null hypothesis always states that the variables studied are independent (Sarantakos, 1993). The chi-square test of independence provides assistance to accept or reject this proposition (hypothesis) and determines the level of significance. Statistical significance for all tests was set at $P<0.05$.

3.5.2 Stage 2: Observations

Stage 2 of the research involved observations. Information pertaining to the observations employed in this study will be now presented, including a rationale for its application and the procedures that were followed. In order to cultivate a richer understanding of the coaching process, the implementation of observations can assist in identifying the teaching styles of coaches within practice environments (Potrac et al., 2000). Before inductive analytical techniques can be implemented to develop a reality grounded analysis of the instructional practice, it is first desirable to develop baseline descriptive data of the instructional behaviours demonstrated by coaching practitioners within sporting contexts. The employment of observation is commonly acknowledged as a valuable research tool for delivering quantitative descriptions of coaching behaviour (Darst, Zakrajsek, & Mancini, 1989; DeMarco, Mancini, Wuest, & Schempp, 1996). According to van der Mars (1989), "despite a relatively short history in the field of sport pedagogy, it has been acknowledged that observation has played a major role in the emergence of coaching behaviour as a bona fide area of empirical study" (p. 44). The same researcher commented that while systematic or direct observation has historically been employed in a range of educational disciplines, it was not presented to teaching and coaching until the 1960s. Shortly thereafter, observation techniques were implemented in Physical Education and sport settings to assist in the exploration of what coaches and their athletes were doing (van der Mars, 1989). Observation provides baseline data of actual (demonstrated in the coaching environment) teaching styles. Berg and Latin (2004) assert that observation as a research method is typified by attaining "data by examining or observing a behaviour or trait and recording it rather than having the subject report it" (p. 209). Prior research has suggested that teachers over-estimate the frequency with which they use various teaching styles (Cothran, et al., 2005; SueSee, 2012). Therefore, the purpose of implementing observations in this study is to verify whether the coaches are actually employing the teaching styles they report using from the survey questionnaires. As the respondents were requested to provide a contact name and phone number if they wished to participate in **Stage 2** and **Stage 3** of the study, the researcher had access to the coaches' initial survey questionnaire responses. These documents were stored in a secure location at the researcher's residence as per ethics requirements. The footage from the video-recorded observations were also stored on the researcher's password protected personal computer.

Thirteen coaches were chosen to participate in **Stage 2** (observations) and **Stage 3** (interviews) of the study. From this group, 12 coaches were selected to participate in three 30 minute observations during their accreditation coaching course and an additional coach was chosen to participate in an extended observation period

of 18 hours over a six-day period. These coaches exhibited many of the distinctive characteristics, and a range of backgrounds and coaching habits, of JD and CP tennis coaches in Australia. As indicated earlier in this study the coaches were selected based on the following criteria:

- Gender.
- Age.
- State or territory in Australia where they coach.
- Coaching experience (years of coaching).
- Age groups most time spent coaching.
- Levels most time spent coaching.

3.5.2.1 Procedures followed for the observations with the 12 coaches

The 12 coaches who were chosen to participate in the three 30 minute observations were video-recorded using a Sony HDRPJ760V HD camcorder. The camera was attached to the back fence of the tennis court at an approximate height of two metres. The three 30 minute observations occurred at different stages during the coaches' accreditation course. As part of their accreditation coaching course, the coaches are required to perform three 30 minute on-court sessions that are designed to assess their understanding of the course content and level of coaching competency. These sessions were video-recorded for this study. Prior to the commencement of each session the coach informed the players that the session would be video-recorded. It was further explained to the players that the exclusive purpose of video-recording the session was to observe coaching behaviour and not to assess their playing ability. Coaches wore a wireless lapel microphone at their sessions for a clear, detailed and accurate auditory recording. The researcher was present for all of the recorded sessions conducted in Victoria. For the sessions conducted in Queensland and New South Wales, the respective Coach Development Coordinators (CDCs) arranged the administration of the recordings. All the coaches admitted to initially feeling self-conscious during the first 30 minute session. According to all the coaches, however, this heightened self-awareness significantly diminished during the remaining observational periods. Based on this feedback, it is acknowledged that the coaches may have adjusted their behaviour during the early stages of the observations.

The six JD coaches were observed and video-recorded coaching three tennis sessions of 30 minutes duration with four junior beginner players. Each JD coach supplied their own students for each session. The sessions were performed during the coaches' accreditation coaching courses conducted by Tennis Australia (TA). As the JD accreditation course was designed to prepare coaches to deliver sessions to beginner junior players, each session focused on coaching a different junior age group in addition to teaching different content. The specific focus of each session in the JD accreditation course was:

- Session 1: Groundstrokes (forehand and backhand) and rally with a tactical theme with 5-8 year old players.
- Session 2: Transition (approaching the net) and net play (volleys and overheads) and rally with a tactical theme with 8-10 year old players.

- Session 3: Serve and Return of Serve and rally with a tactical theme with 10-12 year old players.

It was assumed that the specific requirements of the accreditation course in relation to what to teach during the sessions did not influence the use of certain teaching styles. The coaches were required to teach technical and tactical aspects of playing tennis during each session. This stipulation arguably permitted the employment of a range of teaching styles to achieve the desired learning outcomes. The CP coaches were also observed and video-recorded teaching three coaching sessions of 30 minutes duration. As the CP accreditation coaching course was designed to prepare coaches to deliver sessions to more advanced players, each session focused on developing more tactically and technically advanced content to older and more experienced players. The CP coaches were required to supply four players that were older than 12 years of age and of an intermediate to advanced playing ability. The focus of each session in the CP accreditation course was:

- Session 1: Groundstrokes and a tactical theme.
- Session 2: Serve and Return and a tactical theme.
- Session 3: Rally and a tactical theme.

The sessions that the JD and CP coaches delivered were largely consistent with the requirements outlined in the course content. This requirement might be considered a limiting factor in this study. It could be suggested that the behaviour of the coaches was guided by the course curriculum and the expectations outlined in the assessment requirements and not necessarily representative of the coaches actions when coaching at their place of work.

3.5.2.2 Procedures followed for the extended observations with the single coach

In an effort to observe the employment of teaching styles over an extended period of time, one additional coach was chosen to participate in 18 hours of observations over a six-day period at their place of work. These supplementary observational episodes permitted the researcher to collect additional data over a prolonged period of time and to compare these findings with the 12 coaches who participated in the shorter observational period of the study. They were also employed to see if teaching styles of a coach might vary over an extended time. The researcher selected this particular coach to partake in the extended observational period due to the proximity of the coach's place of work and the researcher's residence. In addition, this coach was known to the researcher and was comfortable having his coaching sessions video-recorded during this time.

All the sessions for the extended observation period of the single coach were also video- recorded using a Sony HDRPJ760V HD camcorder. The camcorder was attached to the back fence of the tennis court at an approximate height of two metres. Prior to the commencement of each session the players were informed by the coach that the session would be video-recorded. As in the case outlined for the 12 coaches observed, it was further explained to the players that the exclusive purpose of video-recording the session was to observe the behaviour of the coach and not to assess

their playing ability. A wireless lapel microphone was worn by the coach for clear, detailed and accurate recordings.

The researcher was present for the first observational episodes conducted at the beginning of the week (Monday) and then for the final two days which were a Friday and Saturday of the same week. Prior to video-recording the first sessions on the Monday evening, the researcher instructed the coach on how to operate the camcorder and attach it to the rear tennis court fence. In order for the researcher to download the lessons to a disc as well as recharge the battery, the camcorder was collected by the researcher at the end of each day. The researcher returned the camcorder to the coach in the afternoon of the following day on Tuesday, Wednesday, Thursday and Friday. As the coach's lessons were conducted on Saturday morning between 9.00am and 12noon the researcher returned the camcorder on Saturday morning prior to 9.00am and the commencement of the coaching sessions. The coach was observed and video-recorded coaching for three hours between 4.00pm and 7.00pm on Monday, Tuesday, Wednesday, Thursday and Friday. On Saturday, the coach was observed for three hours between 9.00am and 12.00pm. The coach delivered four 45 minute lessons to four beginner students between the ages of six to eight between 4.00pm and 7.00pm on Monday, Tuesday and Wednesday. The coach also conducted four 45 minute lessons with this standard and age group on Saturday morning between 9.00am and 12.00pm. The content of the coaching sessions during these observations consisted of teaching technical and tactical aspects of tennis. In each session, the coach focused on a particular technical feature of the players' tennis strokes in addition to a tactical theme. This provided the coach with the opportunity to employ a range of teaching styles if desired. The nature of the sessions were not expected to influence the employment of particular styles. The sessions consisted of:

- Groundstrokes (forehand and backhand) and rally with a tactical theme.
- Transition (approaching the net) and net play (volleys and overheads) and rally with a tactical theme.
- Serve and Return of Serve and rally with a tactical theme.
- Rally (incorporating groundstrokes, transition, net play and serve and return of serve) with a tactical theme.

On Thursday the coach instructed intermediate students aged between nine and thirteen years. The duration of these lessons were three one hour sessions. The content of the coaching sessions during these observations included:

- Groundstrokes (forehand and backhand) with a tactical theme.
- Transition (approaching the net) and net play (volleys and overheads) with a tactical theme.
- Serve and Return with a tactical theme.
- Rally (incorporating groundstrokes, transition, net play and serve and return of serve) with a tactical theme.

According to Thomas, Nelson and Silverman (2005) limitations associated with the employment of observational research are apparent. At the outset, questions arise as to whether an individual's behaviour is subject to accurate interpretation founded on clear definitions. Thomas and colleagues claim that any observed behaviour should

not be "so restricted that they do not depict the critical behaviour" (p. 286). The observations conducted in this study were distinctly defined and observable based on *The Spectrum* (Mosston & Ashworth, 2008) thereby eliminating this particular and potential shortcoming. In **Chapter Two**, it was clearly depicted in how various teaching styles are identified and the processes involved in achieving an accurate and defined outcome of coaching and teaching behaviour. As the focus of the study was interested in the teaching styles that tennis coaches employed during their coaching sessions, the critical behaviour was evidently identifiable and observable. Inadequate training relating to the application of the tools implemented for the observations, coupled with attempting to observe behaviours that exceed the defined parameters, are additional limitations highlighted by Thomas and others (2005). In an effort to lessen the impact of these potential limitations, the study employed Ashworth's Identification of Teaching-Learning Styles Instrument (Ashworth, 2004) (**Appendix B**). Training in connection with of the observational tool was also implemented. This included: numerous trial coding sessions as well as a thorough tutorial on *The Spectrum* (Mosston & Ashworth, 2008) theory. The tutorial consisted of three two hour sessions. Equally, having video-recorded the sessions the coders were able to pause the recordings and replay selected coaching episodes to further consider their interpretations. The use of lapel microphones also contributed to the assurance of accuracy. This procedure afforded the coders with clear and concise information and coaching intent from the coaches. A third limitation relates to what some researchers suggest as certain behaviours not being able to be "evaluated as finely as some observation forms dictate" (Thomas et al., 2005, p. 286). However, referring to the Identification of Classroom Teaching-Learning Styles Instrument (Ashworth, 2004), assisted in minimising this limitational claim. This tool was applied to assist the coders to formulate decisions concerning the teaching style being employed rather than evaluate the effectiveness of its application. Ashworth asserts that the Identification of Classroom Teaching-Learning Styles Instrument (Ashworth, 2004) "does not determine the fidelity or the appropriateness of the teaching-learning approach, but rather it identifies which of the Spectrum landmark teaching-learning styles the classroom behaviour most resembles" (Ashworth, 2004, p. 1).

A final limitation that is often correlated with observation is the impact and influence the observer exhibits over the behaviour of the participants. This potential and detrimental manipulate was addressed in the following way in this study. A requirement of Tennis Australia's (TA) formal accreditation courses involves video-recording each participant during the course. This component of the course is designed to provide feedback about the coaches' on-court behaviour during coaching sessions. These video-recorded sessions are 10 minutes in length and specifically focus on communication with players during sessions.

3.5.2.3 Data analysis: Observation instrument

The recorded tennis lessons were analysed using Ashworth's Identification of Teaching-Learning Styles Instrument (Ashworth, 2004). In personal correspondence, Prof. Sara Ashworth recommended the use of this identification tool to identify which of the landmark teaching styles located on *The Spectrum* (Mosston & Ashworth, 2008) the coaches' behaviour most represents. According to Ashworth:

> The identification of classroom teaching-learning styles chart was designed so anyone (particularly someone who didn't know the Spectrum) could LOOK at the action in the classroom and identify which TEACHING-LEARNING BEHAVIOR 1, 2, 3, 4, ETC … was used. Although this chart does not identify the specific decisions that comprise the various styles, it will help the observer SEE THE ACTION IN THE CLASS and "sorta" associate it to the appropriate teaching style used. (S. Ashworth, personal communication, April 4, 2011)

The identification instrument focuses on subject matter and learner behaviour expectations. Prof. Sara Ashworth kindly provided explicit directions for using the tool (S. Ashworth, personal communication, January 2, 2011). This advice consisted of listening to the coaches' verbal comments and/or the observation of the coaches' actions during lessons to conclude if the subject matter (the task) induced *reproduction* or *production* thinking. Observing the manner in which the learners are participating in the task in order to identify the specific teaching-learning behaviour that was occurring was also recommended by Prof. Sara Ashworth.

In order to code and record the coaches' teaching behaviours during lessons, the Instrument for Identifying Teaching Styles (IFITS) (Curtner-Smith, 2001) coding sheet was used (**Figure 3.2**) in conjunction with the Identification of Classroom Teaching Learning Styles Instrument (Ashworth, 2004).

Interval	**Teaching Style**										
1	A	B	C	D	E	F	G	H	I	J	K
2	A	B	C	D	E	F	G	H	I	J	K
3	A	B	C	D	E	F	G	H	I	J	K
4	A	B	C	D	E	F	G	H	I	J	K
5	A	B	C	D	E	F	G	H	I	J	K
6	A	B	C	D	E	F	G	H	I	J	K

Figure 3.2: An example of a section from the IFITS coding sheet.

This coding instrument has been successfully implemented in other studies (Hasty, 1997; SueSee, 2012) to determine the amount of time that teachers dedicated to employing various teaching styles. The coding procedure employed in using IFITS (Curtner-Smith, 2001) consisted of a ten second observation proceeded by a ten second recording of this observation. In other words, every 20 seconds the coder made a decision regarding which teaching style the coach was using or whether they were engaged in a *Class Management* activity. *Class Management* is time the coach is involved in activity that is not directly related to instruction. This study implemented the *Class Management* categories that Hasty (1997) and SueSee (2012) implemented in their research. These studies employed an assemblage of *Class Management* activities that were defined by the Physical Education Teacher Assessment Instrument (Phillips, Carlisle, Steffen & Stroout, 1986). The *Class Management* categories included: time spent commencing and concluding classes, organising and managing equipment, attending to student behaviour, and any

alternative duties other than instruction. Within *The Spectrum* (Mosston & Ashworth, 2008) theory, however, management is referred to as logistics and is associated with the instructional behaviours of coaches. Ashworth asserts:

> Management is very much related to instruction … the focus of the management becomes part of the content of the lesson … and how the learners are engaged in the management content helps to indicate the teaching style … if a teacher spends 80% of their time in management tasks then all kinds of questions can be asked about content … each style has "management" decisions … we call these logistics. What are the logistics that are needed in order to accomplish the task in the teaching style that is selected? ... for example, Style-C – task sheets, criteria sheets, rackets and balls, pencils to mark sheets, clock … these logistical decisions are a part of the style and not a different experience. Logistics facilitate the anticipated expectations. (S. Ashworth, personal communication, June 6, 2013)

In the event that two or more teaching styles were utilised during an interval of time, the teaching style that resided closest to the *production* end of *The Spectrum* (Mosston & Ashworth, 2008) would be recorded. For instance, if Command Style-A and Practice Style-B were both observed during a ten second observation period then the coders would record Practice Style-B. The work of Hasty (1997) provided the impetus to employ this procedure whereby "the least didactic i.e., more student-centered teaching style is given preference and recorded" (p. 45). Hasty decided that as teachers tend to employ teaching styles from the *production cluster* less frequently, employing a rule that overestimates their implementation would shift any potential bias in the coding toward these teaching styles. If a teaching style and a *Class Management* task were being employed simultaneously during a ten second observation (such as moving markers) the teaching style was afforded precedence and coded. Percentages and rate per 20 seconds for each teaching style were calculated and totalled. The use of percentages has been used in a number of other coach behaviour studies (Potrac et al., 2002; Smith & Cushion, 2006; Potrac et al., 2007; Ford et al., 2010) and has been recommended as a reliable variable (Ford et al., 2010). The IFITS (Curtner-Smith, 2001) coding sheet with raw data is located in **Appendix C**.

3.5.2.4 Observation instrument: Pilot study

In order to examine the reliability and validity of the observation instrument a pilot study was undertaken. Six youth tennis coaching sessions of 30 minutes duration were video-recorded at a local tennis club. To scrutinise inter-observer agreement, the researcher and an independent trained coder, who also participated in the coding of the larger study, watched video-recordings of each of the 30 minute coaching sessions alone and at separate times during a single week. To account for intra-observer reliability, the researcher watched video-recordings of each coaching session on two separate occasions. For intra-observer agreement, there was a one week gap without any access to the video-recorded sessions between the first and second observation. A one week interlude is recommended to permit memory lapse to occur (Darst et al., 1989). Inter-observer and intra-observer agreement were calculated using the equation (agreements/ (agreements + disagreements) x 100 (van der Mars, 1989). For time-motion analysis, inter-observer agreement was 98.3% and

intra-observer agreement was 97.3%. These figures correspond with the recommendations of subsequent researchers, who regarded an agreement score of 85% or higher to deliver appropriate reliability (Rushall, 1977, van der Mars, 1989). The reliability and validity of the observations in the larger study was also assured by inter-observer and intra-observers' agreement, with a 30-day interval, from Bellack's formula (1966 as cited in van der Mars, 1989). According to the minimum value given in the literature, ten percent of the total observations was analysed for each behaviour (Tabachnick & Fidell, 1989). The minimum value found was 92% for intra-observer agreement.

The researcher and the second individual who was trained in the coding process coded the video-recorded sessions. As indicated earlier, the researcher was a trained Physical Education teacher with a Master of Education as well as a Club Professional tennis coach with over 20 years' experience. The second coder had a Bachelor of Human Movement degree and was also a Club Professional tennis coach with over 10 years' experience. The second coder extensively studied *The Spectrum* (Mosston & Ashworth, 2008) theory and was additionally trained by the researcher prior to coding the participants. To expedite inter-observer reliability, both coders practised coding with IFITS (Curtner-Smith, 2001) for extended periods of time. Practice consisted of coding live and video-recorded sessions. As all the coaches' sessions were video-recorded, it was possible for the coders to pause the recordings at any stage to facilitate discussion. In order to further develop the coders' competency in recognising teaching styles and to clarify any queries during the coding process, extensive consultation with Prof. Sara Ashworth was employed. To enable this, the researcher emailed precise descriptions of the observed teaching episodes followed by a preliminary attempt to interpret the teaching episode. Prof. Sara Ashworth would then respond via email with an interpretation and description of the teaching episodes in question. An example of one of these exchanges is provided below:

The researcher's description of a teaching episode:

During another observational interval (20 seconds), the coach has four students standing in front of him. He is explaining the forehand groundstroke swing pattern. He demonstrates the swing and then has the students copy/ shadow with his as he paces the swing pattern. He continues to swing while watching the students model or shadow his movement exactly. This is repeated for 15 repetitions.

The researcher's analysis:

In this teaching episode, the content is to be replicated as demonstrated (shown/explained) to the students. The behaviour is synchronised, with on-cue and immediate responses. The coach makes decisions in relation to starting time, pace and rhythm and stopping time. I would analyse this episode as akin to Command Style-A.

Prof. Sara Ashworth's analysis:

Yes it is the Command Style … This outline refers to the "parts" that must be considered when making time decisions in the Command style.

1. Time: (For the performance of the task) Time has 3 parts starting, pace & rhythm, and stopping … comments about each need to occur for precision performance.

a. Starting time:

1. Preparatory phrase (Ready … on your mark) In order for the performance to be "all together"/in unison there needs to be a PREPARATORY PHRASE. This phrase focuses the attention -- the learner/performer 'assembles" his/her thinking, emotions, energy, and courage (whatever is needed for the performance)! AND waits for the Command signal to Begin.

2. Command signal: (Now! Go! Begin! pointing to the content; etc.) the command signal begins the action.

b. Pace/Rhythm: determines the flow of the performance In order for the Pace &Rhythm (the actual performance of the task) to be "all together" there must be some kind of signal for everyone to follow to keep them together … in your example it is modelling the individual slow motion movements … the P&R could be most anything ... Learning to select the most appropriate P&R signal for the task is tricky. There are correct P&R signals and incorrect signals.
c. Stopping time: (signal to end the performance of the task) when the performance is coming to an end there is some kind of signal to stop… In some tasks, it's the end of the dance or the music selection, when performing aerobics the leader gives some count that says the last one will be the next one!

Mitch … I hope my comments are helpful … you did a fine job detailing your observations and matching them to the appropriate teaching style. Your reasons for attaching observations with a particular style were almost always correct. Well done. Are you surprised that you did not see as many Style A episodes as you thought you would? Style A is a difficult style … Style B is BIG … it has so many different images and possibilities … Your analysis is really right on … well done. (S. Ashworth, personal communication, June 20, 2011)

This process proved to be an invaluable exercise for the coders and undoubtedly assisted in promoting a high degree of accuracy of the coded lessons. Prof. Sara Ashworth's knowledge of *The Spectrum* (Mosston & Ashworth, 2008) is exhaustive. Since being introduced to *The Spectrum* (Mosston & Ashworth, 2008) by its creator, the late Dr. Muska Mosston in 1969, Prof. Sara Ashworth has continued to play a central role in the development and refinement of *The Spectrum's* (Mosston & Ashworth, 2008) theoretical and practical application. Her contributions to this study add significant expertise and a high degree of validity with regard to understanding, interpreting and applying *The Spectrum* (Mosston & Ashworth, 2008) theory to research.

Prof. Sara Ashworth's guidance during the coding process proved valuable in identifying and labelling teaching behaviours that did not precisely match the decision structure of some of the landmark teaching styles on *The Spectrum*

(Mosston & Ashworth, 2008). As previously outlined on several occasions, *The Spectrum* (Mosston & Ashworth, 2008) has 11 landmark teaching styles that embody different teaching and learning encounters. Situated between these landmark teaching styles are countless variations called canopy designs. Canopy designs highlight and share approximate, but not precise learning objectives, decision structures and the developmental focus of the landmark teaching style(s) they are located near or in between. Rather than match and label these behaviours as a landmark teaching style, it was decided to recognise and identify the specific decision structure of the behaviour, and then label these behaviours accordingly. Signifying the distinction between landmark teaching styles and canopy designs was deemed to be essential for accountability and for understanding the exact learning behaviour that was occurring during coaching sessions. Highlighting this difference was also necessary for research conclusions, and for determining the level of congruence between teaching intent and action (S. Ashworth, personal communication, April 16, 2012). In the event that the coders were unable to accurately match the coaching behaviours with the landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008) Prof. Sara Ashworth was consulted. Below is one example from many email communications with Prof. Sara Ashworth discussing the identification of behaviour that approximated the decision structure of landmark teaching styles. Prof. Sara Ashworth's comments are represented in bold text.

> Hello Sara
>
> I understand that my coach's example is not 'pure' Landmark Style A - and for the very reasons you have stipulated. Namely, the synchronised, 'pure pace and rhythm' precision component. In this case, do you think I should label this observation as Command Style A (but with some type of comment that further clarifies?). What I don't want occurring is that someone reads the results of the observations, sees that (for argument's sake) that 60% of tennis coaches are using Command Style A during their coaching sessions from 'often to always' - and from this, have an image of synchronised patterns 'across the board'. **This observation and conclusion is very sensitive and theoretically appropriate---you do not want to "label" the actions of a field by one image--especially since the image of the Command Style is so misunderstood**. As we have discussed before, there was another teaching episode, which we both agreed, was Command Style A - this episode saw the coach demonstrating a service swing with the players copying the coaches' action exactly - including and most importantly, pace and rhythm. No balls are being hit in this instance, rather, students are 'mirroring' or 'shadowing' the coaches action**. It would be very appropriate to "coin" a clarifying comment that fits this classroom reality. There are many legitimate experiences in the classroom that fall into this category-Style A with adjustable P&R.** The coach does adjust the P&R in this episode so the learners can mirror and shadow more accurately**.** Can you see the issue? **Absolutely**. I have labelled BOTH Command Style A, however, one is more 'pure' (precision performance) (for want of a better word) Command Style A than the other? This would be correct to do ... and in your explanation you can make mention of this distinction … There is Style A and then there is Style A- with less precision! The more I think, perhaps, that example one should be labelled **Canopy Style A-**precise **pace & rhythm (with perhaps a comment that expands on your comments about 'pure**

pace and rhythm'? Because the T has not relinquished or shifted P&R to the Ls completely, I would use a qualifying word before P&R Style A- precise P&R ... or total P&R ... or consistent P&R ... or ????? (S. Ashworth, personal communication, June 21, 2011)

The correspondence with Prof. Sara Ashworth, with regard to creating the labels for the behaviours that approximated the landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008), is provided below. Prof. Sara Ashworth's comments are represented in bold text.

Hello Sara

I hope you are well. Here are some concluding comments/suggestions based on our previous discussions concerning the labelling of the coaching behaviours that did not precisely or exactly match the landmark teaching styles on The Spectrum.

1. Approximation of landmark teaching style Command Style-A (canopy design label)

So this is what we have. All the behaviours we observed and coded that approximated landmark teaching style Command Style-A were essentially missing ONE component of this style's decision structure. This was PACE and RHYTHM. In this case, the players were making this decision.

So, we cannot label this variation as landmark teaching style Command Style-A. In our last email, we discussed the possibility of using the label described below to identify this approximation to landmark teaching style Command Style-A (canopy design)

Canopy Command Style-A minus exact (or precise or total) pace and rhythm?

As you might remember we also discussed the possibility of

Canopy Command Style-A minus pace and rhythm

Mitch - the words exact or precise or total are a little ambiguous -be sure you identify the decision that was missing accurately. We do have a short hand for the term CANOPY -- it looks like this Â. The symbol above the letter represents canopy of that Style …

1. Approximation of landmark teaching style Practice Style-B (canopy design label)

Now, in the case of the next example.

All the behaviours we observed and coded that approximated landmark teaching style Practice Style-B had an additional decision and element that is NOT part of landmark teaching style Practice Style-B. This decision related to socialisation. As you know – in Practice Style-B, the focus of learning is to initiate individual and private practice of a memory/reproduction task while receiving private feedback from the coach/teacher. Now in ALL these approximated behaviours we observed and coded, the only variation to the decision structure of landmark teaching style Practice Style-B was the ADDITION OF A SOCIAL ELEMENT OR DECISION – SOCIALISATION. As we talked about previously, the players were

practising with each other. They were practising a memory/reproduction task, and the coach was providing private feedback to each player, BUT they were practising with a partner. So the label we previously discussed was:

Canopy design Style-B plus (+) a social partnership to complete the task
Canopy design Style-B plus social partnership to complete the task (in this case it is an added decision … therefore, plus socialization) !!! some canopies are MINUS and some are PLUS … If the decision moves the experience toward the next style it is a plus … if it takes away from the style's landmark set of decisions then it is a minus!!! socialization moves Practice Style-B toward Reciprocal Style-C …However, it is not similar to Style C's objectives and intent of developing observation and feedback skills, therefore it is canopy B+ socialization.

Omitting pace and rhythm from Style A is a distraction from the landmark decisions; therefore a minus …
I haven't shared that information with anyone in a long time!!!
Mitch you did a terrific job gathering this data. (S. Ashworth, personal communication, April 16, 2012)

After coding the coaches' sessions, two landmark teaching styles were identified. These included:

- Landmark teaching style Command Style-A.
- Landmark teaching style Practice Style-B.

In addition to observing these styles, two variations that approximated the decision structure of the landmark teaching styles (canopy designs) were also identified. These were:

- Canopy design Command Style-A minus (-) pace and rhythm.

The abbreviation for this notation is: **Â-P&R**.

- Canopy design Practice Style-B plus (+) a social partnership to complete the task.

The abbreviation for this notation is**: B̂+socialisation.**

Since the decision structure of a landmark teaching style differs from a canopy design, they cannot be labelled with a similar description. As previously discussed, the labels consigned to canopy designs are determined according to:

- The landmark style(s) they most support.
- The decision(s) that distinguish them from the landmark teaching style.
- The central development focus that differs from the landmark teaching style(s). (Ashworth, 2010)

^

Canopy design Command Style-A minus (-) pace and rhythm (A-P&R)

As defined earlier in **Chapter Two**, the key features of landmark teaching style Command Style-A consist of a precision performance that reproduces a projected response on cue. In the decision structure of this landmark style, the teacher or coach makes all the decisions in the *pre-impact set* (i.e., decisions relating to planning and content preparation), *impact set* (i.e., decisions relating to the implementation, execution and performance of tasks), and *post-impact set* (i.e., decisions relating to assessment and feedback). The learners' function is to follow these decisions on cue (Mosston & Ashworth, 2008).

The canopy design that approximated the decision structure of landmark teaching style Command Style-A was labelled canopy design Command Style-A minus (-) pace and rhythm (**Â -P&R**). The assigned labelling means that this particular teaching episode follows the decision structure of landmark teaching style Command Style-A while omitting the decision of pace and rhythm. In this case, the learner made the decisions pertaining to speed or how quickly or slowly (pace and rhythm) they decided to perform the task or activity. This canopy design is labelled with a 'minus' (i.e., canopy design **Â -P&R**) as a particular decision (i.e., pace and rhythm) moves the experience away from the decision structured outlined in the impact set of landmark teaching style Command Style-A.

Canopy design Practice Style-B plus (+) a social partnership to complete the task (B̂+socialisation).

The central characteristics of landmark teaching style Practice Style-B consists of: "individual and private practice of a memory/reproduction task with private feedback" (Mosston & Ashworth, 2008, p. 94). In this style, the coach or teacher make all the decisions in the *pre-impact set* (i.e., decisions relating to planning and content preparation), and *post-impact set* (i.e., decisions relating to assessment and feedback). With the *impact set* (i.e., decisions relating to the implementation, execution and performance of tasks), a change occurs in relation to who makes certain decisions. The nine decisions listed below are shifted from the teacher or coach to the learner in the impact set of landmark teaching style Practice Style-B. In other words, the learner now makes all the decisions in the impact set related to:

1. Location.
2. Order of tasks.
3. Starting time per task.
4. Pace and rhythm.
5. Stopping time per task.
6. Interval.
7. Initiating questions for clarification.
8. Attire and appearance.
9. Posture. (Mosston and Ashworth, 2008, p.95)

The canopy design that approximated the decision structure of landmark teaching style Practice Style-B was labelled canopy design Practice Style-B plus (+) a social partnership to complete the task (**B̂+socialisation**). The assigned labelling means that

this specific teaching episode follows the decision structure of landmark teaching style Practice Style-B while adding the element of socialisation (i.e., interacting with other learners during the task). The decision of socialisation or interacting with others while performing a task is not part of the decision structure of landmark teaching style Practice Style-B. Rather, individual and private practice of a task is a requirement during the *impact set* of this landmark style. This canopy design is labelled with a 'plus' (+) (i.e., canopy design **B̂+socialisation**), as the addition of socialisation moves the learning experience toward the next landmark teaching style. The next landmark teaching style on *The Spectrum* is landmark Reciprocal Style-C. A key feature of this landmark style is social interaction and partnerships that develops feedback, observation and communication skills. The researcher communicated extensively with Prof. Sara Ashworth when analysing and coding the canopy designs. The second coder was not involved in this aspect of the study due to their lack of knowledge with regard to canopy designs.

Reliability is critical when design decisions are being made based on observations, and essential for allowing researchers to accurately communicate their findings. Lack of reliability in observations can indicate that observers are missing important details, that they are not categorising observations in the same way, or that what appeared to be similar circumstances are actually not. The formula that was used in this study to estimate inter-observer reliability and agreement divides the number of agreements in behaviour coding by the sum of the agreements and disagreements (Thomas et al., 2001, p. 190). This formula is outlined below.

$$\text{Inter-observer agreement} = \frac{\text{Agreements}}{(\text{Agreements} + \text{Disagreements})}$$

Inter-observer agreement were calculated for the larger study using the above equation (agreements/ (agreements + disagreements) x 100 (van der Mars, 1989). The lowest recorded level for inter-observer agreement for the 12 coaches three 30 minute sessions (n=36 sessions) was 97.6% and the highest was 100%. These figures correspond with the recommendations of subsequent researchers, who regarded an agreement score of 85% or higher to deliver appropriate reliability (Rushall, 1977, van der Mars, 1989). Inter-observer agreement was also calculated using the above equation for the extended observations of the single coach (n=18 hours). The lowest recorded level for inter-observer agreement for the 18 hours of coaching was 95.8% and the highest was 98.8%. These calculations also parallel the recommended inter-observer agreement scores of 85% or higher to provide suitable reliability (Rushall, 1977, van der Mars, 1989).

3.5.3 Stage 3: Interviews

Stage 3 of the research consisted of implementing interviews with the 13 coaches who participated in **Stage 2** (observation) of the study. This included the 12 coaches who were observed during three 30 minute sessions in addition to the single coach who was observed for an extended period of time (18 hours). While observations can provide descriptive data of coaching practice, it cannot "provide an insight into why coaches do what they do" (Potrac et al., 2000, p. 192). Furthermore,

not everything is observable – for instance, feelings, thoughts and intentions (Patton, 1990). Research that addresses the individual interpretations of coaches' experiences via interview techniques presents the prospect of engendering theory that is an accurate and authentic representation of the complex realities of sports coaching (Cote et al.,1995b; Potrac et al., 2002). Additionally, it has been established that the teaching styles of coaches are influenced by their "own experiences of their sport with their enthusiasm, attitude, commitment, and outlook on coaching reflecting their personal enjoyment and success in training" (Potrac et al., 2000, p. 192). These experiential, social, and contextual factors, which impact upon the instructional practice in sport, can only be explored by interpretive investigation that seeks to explore the *lifeworlds* of coaches (Potrac et al., 2000). This approach permits a concentrated understanding of the intricate interactions contained in the dynamic process of coaching, an appreciation of the contexts in which coaches operate, as well as the influence that these settings have on instructional behaviours (Strean, 1998). Therefore, it is advised that methods such as observation be accompanied with idiographic and introspective research methods such as interviews (Martens, 1987). Similarly, Gould, Hodge, Peterson and Petlichkoff (1987) advocate that observational data gathered on the instructional behaviours of coaches should be complemented with "in-depth interviews that allow for the acquisition and interpretation of rich qualitative data" (p. 307). This information collected may then be utilised to develop theory that accurately reflects the everyday complexities of the instructional process in sports coaching" (Potrac, et al., 2000, p. 193).

To effusively encapsulate the complex nature of coaching, observational techniques should be supplemented by interviews (DeMarco, Mancini, Wuest & Schempp, 1996; Potrac et al., 2000; Potrac et al., 2002). According to Lyle (1999): "too many studies have adopted a quantitative survey approach [where] the need for the control of variable and reliable operationalization of constructs has mitigated against a more insightful and interpretative investigation of values, behaviors and context" (p. 30). Indeed, Cote and others (1995) emphasised the importance of examining, in greater depth, the knowledge of expert coaches to provide insights for coach education. Thus, to aid in the interpretation and understanding of coaches' actions and cognitions, observation was followed up with interviews (Martens, 1987; Potrac et al., 2002). In this study, the interviews and observations formed an important association in gaining a richer understanding of a number of issues. For instance, reflecting on the video-footage permitted the researcher and interviewees to further explore the motivations that underpin the employment of particular instructional processes. It was anticipated that the combination of self-report survey questionnaires, observation and interview techniques would result in the creation of data whereby the qualitative findings further illuminated the meaning of the quantitative research techniques. In fact, it was hoped that this blend of research methods would more precisely focus on the entirety of coaches' behaviour and insights by revealing the multidimensional and intricate level exchanges and interactions that epitomise the everyday and complex reality of the dynamic coaching process confronting JD and CP tennis coaches in Australia.

According to deMarrais (2004), "an interview is a process in which a researcher and participant engage in a conversation focused on questions related to research" (p. 54). Sarantakos (2005) indicates that interviews consist of seven symbiotic components. These include:

- The selection of participants (the invitation, without coercion, to participate).
- Arranging the pragmatics of the interview (date, time, duration, conditions).
- Conducting the interview.
- Ensuring that the interview maintains the broadly intended direction.
- Avoiding bias.
- Accurate transcription.
- The maintenance of positive relations with the participants. (p.78)

Semi-structured interviews commence with a prearranged group of questions and permit scope in direction so that the interviewer may follow what is considered as pertinent to the interviewee (Freebody, 2003). This provision of latitude does not infer an *open slather* approach – instead, an interview guide is developed to outline the objectives of the interview in a measured fashion. The interviewer administers the predetermined set of questions and progresses, at times, with unprepared affixed questions that afford the interviewee a degree of latitude in their responses. This flexibility was essential because any major restrictions placed upon the participants can narrow the scope of the interview and interfere with the eliciting process (Reitman-Olson & Biolsi, 1991).

3.5.3.1 Procedures followed for the interviews

The interviews with the 12 coaches who were observed during three 30 minute sessions were conducted within three days of their final 30 minute observations. The researcher conducted and video-recorded all the coach interviews with a Sony IC MP3 recorder. As the researcher resides in Victoria, all the participants from Victoria were interviewed face-to-face by the researcher. These interviews were conducted at a time and venue that was suitable for the participants. These venues included: tennis clubs, cafes, and a personal residence. Telephone interviews were conducted for the participants that resided in Queensland and New South Wales. The interviews that were conducted via the telephone were broadcast on loud speaker at the personal residence of the researcher to enable the Sony IC recorder to clearly tape the conversation. During these interviews, the participants were assured that only the researcher was present. The interviews were originally scheduled for 45 minutes each, however, all 12 interviews continued between 80 and 100 minutes in length. The interview process for the single coach, who was observed for an extended period of time (18 hours), was comparable to the procedure implemented for the 12 coaches who were observed during three 30 minute coaching sessions. This particular interview was conducted at the coach's residence three days after the final observational period. The duration of the interview was 95 minutes in length.

All the interviewees were eager to continue the process beyond the initial time period allocated for each interview. Each interview commenced with a set of greeting and introductory statements that were designed to encourage the coaches to feel comfortable talking while being recorded. The first of six research questions were then posed to the participants. These questions were designed to obtain in-depth information in relation to the coaches' insights about teaching styles. The interview questions were:

1: “Could you identify or tell me what has or have been the major influences on the *way* you currently coach?”
2: “After watching your three observed coaching sessions what are your thoughts with regard to the *way* you coached?”
3: “Are there any additional *ways* of coaching tennis?”
4: “Can you interpret and define the *ways* you coached during your three observed coaching sessions?”
5: “Can you interpret and define any additional *ways* of coaching tennis?”
6: “Can you outline and discuss your reasons for adopting these *ways* that you coached during the three observation sessions?”

The researcher gave no hints as to what would be an appropriate or desirable response – there were no ‘right’ or ‘wrong’ answers. While remaining neutral about the content of the interview, the researcher attempted to make each coach feel the information they shared was valuable (Cote et al., 1995b). Use of body language, such as nodding, and words of thanks, encouragement and support helped to create a context in which each coach felt comfortable and motivated to express their knowledge (Patton, 2002). As suggested by Patton (2002) the interview questions posed were clear and expressed in plain language that was simple for the participants to understand. Despite adhering to focus questions, the interviews were *reflexive* (Hammersley & Atkinson, 1983) in nature in that all the participants were encouraged to explore certain themes with the interviewer (Sparkes & Templin, 1992). The use of *probing* techniques was employed to assist participants in clarifying or expanding their responses. Detailed *probe* questions comprised the basic *who*, *what*, *where*, *when*, and *how*. For instance, during the course of the interview the researcher requested participants to further elaborate on particular aspects of their responses. In this way the “insider’s perspective remained at the heart of the interviews, with the respondent’s reasons, meanings and interpretations for involving himself in certain coaching behaviours being significant” (Potrac et al., 2010, p. 187). In this regard, as Sparkes & Templin (1992) have stated, “such a perspective is of great importance in any attempt to explain why people act in certain ways rather than others” (p. 121). It was decided that direct reference to what the participants had indicated in the survey questionnaire (with regard to the teaching styles they self-identified using) and what was observed would not be pursued. Submitting the participant to this line of questioning may have created an examination-like setting. The researcher did not wish to intimidate or embarrass the participant with a direct comparison of the teaching styles they self-identified in the survey questionnaire and what they actually used during the observations. It was assumed that omitting this particular aspect from the interview would not significantly influence the outcome of the results.

The same interview guide was used with each participant in an attempt to maintain consistent responses in relation to depth and complexity (Patton, 2002). At the conclusion of each interview, all the participants were encouraged to provide any additional information that they deemed appropriate or relevant and ask any questions about the interview process or content discussed throughout the interview. The researcher provided the participants with a phone number, email address and residential address in the event that they wished to contact the researcher to append any further commentary concerning the topics discussed during the interviews. Once the interview transcripts were typed each participant received a copy.

3.5.3.2 Data analysis

Using the Nvivo 8.0 software, the interview data were analysed via deductive content analysis (Patton, 2002). Each interview was transcribed verbatim into Microsoft word rich text format. Only minor editing procedures were performed on the transcripts. For instance, any names or references used in the study of the coaches were omitted and replaced with assigned pseudonyms to protect the respondents' anonymity. As soon as the coach's interview transcript was completed, it was re-read. This process helped the researcher to: (a) become highly familiar with each coach's interview and (b) facilitate the content analysis (Cote et al., 1995b). The interview transcripts were analysed based upon the procedures and techniques of grounded theory (1995b). Grounded theory is an inductive methodology for developing theory grounded in data systematically collected and analysed (Saury & Durand, 1998). It consists of two main operations: (a) breaking down the data into meaningful units and (b) grouping units with similar meanings into broader categories. The objective of this analysis was to organise and interpret the unstructured qualitative data obtained from the interviews with the coaches. The first step was a detailed line-by-line examination of the interview transcripts and involved highlighting sections of text into meaningful and significant excerpts. Tesch (1990) defined these "meaning units as a segment of text … comprehensible by itself and contains one idea, episode or piece of information" (p. 116). Second, similar features between meaning units were identified. This procedure, referred to as "creating categories" (Cote et al., 1995b, p. 35) involved comparing meaning units and grouping them together to organise common meaning units into distinct sub-categories. A sub-category was named according to the common features that all its meaning units shared (Cote et al., 1995b).

As suggested by Patton (2002) exemplar quotations were used as a representational form to present the findings. Specifically, these quotations from the coaches were presented to help illustrate the categories. To increase the validity of the analysis, the coding process was discussed at different moments with a peer familiar with, and knowledgeable about, research in coaching behaviours. To ensure the soundness of the data collection and analysis, *member checking* was employed (Patton, 2002) which involves referring back to respondents in an attempt to confirm that the research has accurately represented their ideas and responses. *Member checking* occurred twice in this study. First, the interview transcription packages were provided to the participants and they were invited to clarify, elaborate, or suggest changes to the original responses. All the participants agreed that the transcriptions were accurate and besides correcting some spelling mistakes, none of the participants had any queries about or requested adjustments to the transcripts. The second *member checking* occurred after the analysis of the data was completed. Once again, all the participants were invited to respond to the interpretations and to correct inaccurate information. On this occasion, the participants did not suggest any amendments. Interview transcripts for two of the participants are provided in **Appendix D**.

3.6 Criteria for qualitative research

According to Lincoln and Guba (2000) there exists a range of criteria for assessing the soundness and trustworthiness of qualitative research. These include: (a) credibility, (b) transferability, (c) dependability and (d) confirmability. Prolonged engagement, persistent observation and triangulation are three techniques that can increase the probability of achieving credible findings. The implementation of *member checking* was implemented in this study to achieve the criteria of prolonged engagement and persistent observation. This study employed *member checks* during and after the interview process. The researcher summarised information during the interview and then asked the participants to determine the accuracy of the responses. *Member checks* were also completed following the interview process by sharing the interview transcripts with each of the participants. This allowed the participants to critically analyse the findings and provide comment where appropriate. Triangulation refers to the application of multiple data collection techniques that provide a process for comparing and cross-checking the consistency of information (Stake, 2005). This study intends to employ three different data collection techniques including: (a) survey questionnaires, (b) observations and (c) interviews.

Transferability refers to the extent to which research findings can be applied to other contexts (Patton, 2002). Specific techniques that this study used to achieve transferability were generating 'thick' descriptions of the research sample. 'Thick' descriptions are richly described data that provide information to other researchers to judge the appropriateness of applying the findings to other settings (Patton, 2002).

Other criteria used to judge qualitative research is the *confirmability* or *dependability* of the research process (Koch, 1994). This is achieved through the researcher's audit trail. An audit trail allows an independent examiner to track the decisions made and steps taken in the study. An audit trail was also implemented in this study that consisted of a comprehensive collection of documentation relating to all aspects of the research process (Koch, 1994). For instance, research journals, original data (audio files, interview transcripts, observation notes and video files), have been maintained.

3.7 Research politics and ethics

As both independent researcher and employee at Tennis Australia (TA) the researcher ultimately possesses the power to determine what is included in this study and whose voices are represented. Consequently, the researcher was mindful of avoiding a conflict of interest that may render this study as appearing "negligent, incompetent, biased and/or deceptive" (Israel & Hay, 2006, p. 126). In not wanting to communicate conclusions that are partial or become subject to influence or persuasion by a client-centred research agenda, the researcher was aware of the ethical and political importance of consigning the interests of the participants. Acting professionally and ethically in the absence of political agenda while attempting to accurately record the narratives, actions and viewpoints of the respondents as well as dealing with "conflicting political pressures without being captive to anyone's particular vested interest" (Simons & Usher, 2000, p. 39) was a high priority. This task presented as a complex set of judgements involving the researcher's sensitivity toward achieving a balance between the well-being, privacy and rights of the

research participants and the generation and dissemination of knowledge and the truth. By establishing a "relationship of professional equality" (McDougall, 2004, p. 31) and creating a collaborative and supportive environment representative of mutual trust and respect during the study, the researcher expected to navigate through the issues and capture the accurate responses of the research participants in this study.

Informed consent, confidentiality and anonymity represent additional ethical issues in this study. The University of Southern Queensland Human Research Ethics Committee (Appendix E) granted the research ethics approval for this study. The ethics approval number for this submission was H10REA064.1. Prior to approaching the respondents in this study to participate, Patrick McInerney, National Coach Education Manager, TA (**Appendix F**), formally granted approval. Each participant received a plain language statement that outlined the objectives of the research and invited them to participate in the study (**Appendix G**). The participants who agreed to participate in **Stage 2** (observation) and **Stage 3** (interviews) of the study were also requested to sign a consent form (**Appendix H**). By signing this form the respondents provided permission to participate in the study with full knowledge of the purpose of the research and consequences for their involvement. Confidentiality and anonymity were assured throughout the entire research process and during any presentation, reporting or discussion of the findings and subsequent publishing of the thesis. The participants were free to withdraw from the study at any time and reserved the right to refuse permission to publish any of the information that they provided throughout the course of the research. The researcher also provided the parents or guardians of the players involved in the observations with a plain language statement outlining the objectives of the study and invitation to participate in the observations (**Appendix I**). The parents or guardians of the participants who agreed to participate in the observations were also requested to sign a consent form (**Appendix J**). The signed consent forms, survey questionnaires, video-recorded coaching sessions and interview recordings and transcripts were stored in a secure location at the researcher's residence in accordance with ethics requirements.

3.8 Conclusion

Chapter Three has outlined the research methodology employed in this study. Specifically, an account of the research design, participants, methods of data collection, procedures, and data analysis has been provided. **Chapter Three** also provided an explanation and justification of the philosophical assumptions that underpinned the selected research methodology as well as relevant ethical considerations appended to this study. It was anticipated that the combination of survey questionnaires, observation s and interview techniques would result in the creation of data whereby the qualitative findings further illuminated the meaning of the quantitative research techniques. **Chapter Four** reports the results from **Stage 1** (Survey questionnaire), **Stage 2** (observations) and **Stage 3** (interviews) of the study.

CHAPTER FOUR: RESULTS

The purpose of this thesis was to investigate the teaching styles that tennis coaches implement during coaching sessions in addition to the coaches' insights that underpin these practices. More specifically, the aims of this research were to provide answers to the following research questions:

1. What teaching styles do Junior Development (JD) and Club Professional (CP) tennis coaches in Australia believe they are using during coaching sessions throughout the year?

2. What teaching styles are Junior Development (JD) and Club Professional (CP) tennis coaches in Australia actually using during coaching sessions?

3. What are the coaches' insights of the teaching styles they employ during coaching sessions?

Chapter Four presents the findings from **Stage 1** (survey questionnaire), **Stage 2** (observations) and **Stage 3** (interviews) of the study. The findings from **Stage 1** are the first presented. The **Stage 1** survey questionnaire consisted of two parts. **Part A** posed questions relating to socio-demographic information in addition to coaching habits. These results provide the reader with an overview of the socio-demographic characteristics and coaching habits of the 208 participants who completed the survey questionnaire. The second part of the questionnaire (**Part B**) then presented one question relating to the *description inventory of landmark teaching styles.* The question (for each of the 11 landmark teaching styles for which a description was provided) was: '*How frequently do I use this landmark teaching style in my coaching sessions throughout the year?*' A five-point rating scale was used for participant ratings. The researcher presents a percentage breakdown of all the coaches' (n=208) self-identified usage of teaching styles followed by a percentage comparison of the self-identified teaching styles of JD (n=130), CP (n=78) and all the coaches (n=208) who reported using the teaching styles, *most of the time* to *often*. After the findings from the survey questionnaire, the researcher presents the results from **Stage 2** (observations) of the study. The observations consisted of observing 12 coaches during three 30 minute coaching sessions with four players, in addition to an additional coach who was observed over an extended period of 18 hours. The purpose of implementing observations in this study was to verify if the coaches were actually employing the teaching styles they self-identified in the survey questionnaire. This objective considers the coaches lack of knowledge of instructional practices as well as not being familiar with *The Spectrum* (Mosston & Ashworth, 2008). Observations were also used to explore the coaches' knowledge, expertise and self-awareness of the teaching styles they use during practice. At this point, a comparison of the findings from **Stage 1** (interviews) and **Stage 2** (observations) of the study will be provided to assess the level of congruence between the coaches' intent (self-identified teaching styles) and action (observations).

After detailing the findings from **Stage 2** and comparing these findings with the teaching styles that the coaches self-identified, the researcher will describe the results from **Stage 3**. This stage consisted of implementing interviews with the

coaches who participated in **Stage 2** (observations). The interviews allowed a profound understanding of the complex interactions contained in the dynamic process of coaching, an appreciation of the contexts in which coaches operate, as well as the influence that these settings have on instructional behaviours (Strean, 1998). It also permitted the researcher to investigate the cognitive processes that underpin the coaches' behaviour that may provide an insight into the level of congruence between what the coaches believed they were doing during coaching sessions and what they were actually doing. As indicated previously, due to the coaches' lack of knowledge, what they think they are doing may not actually be the case.

In the light of the results presented in this chapter, the researcher will then interpret and locate the findings within the relevant body of literature in **Chapter Five**.

4.1 Stage 1: Survey questionnaire

4.1.1 Part A: Socio-demographic status and coaching habits

Stage 1 of the study was a survey questionnaire. A total of nine figures depicting the percentage responses of coaches from the information gathered in **Part A** of the survey questionnaire are presented in this section of the study. **Part A** of the survey questionnaire collected data on the participants' socio-demographic status in addition to their coaching habits. Although these areas have been outlined earlier, the specific items located in **Part A** of the survey questionnaire are provided below:

- Gender.
- Age of coaches.
- State or territory where participants currently coach.
- Highest educational qualification.
- Level of students most time spent coaching per week.
- Age of students most time spent coaching per week.
- Coaching qualification the participants are currently completing.
- Number of years the participants have been coaching.
- Number of hours the participants coach per week.

This data is presented to provide an outline of the coaches' socio-demographic status in addition to their coaching habits and will be of use in later considerations and discussions.

A general overview of the results indicated that a large majority of the coaches in this study were male (82.2%) and currently coach in Victoria (60.1%). Most of the participants were aged between 20-29 years (40.87%) and were completing the JD coaching course (62.5%). Approximately 88 coaches (42.31%) from the total sample (n=208) reported their highest educational qualification as secondary school with just under 30% of the participants indicating they had completed an undergraduate degree. Almost 50% have been coaching between 0-3 years, with 33% indicating that they coach between 11-20 hours a week and 20%

coaching 21-30 hours per week. The majority of participants reported that they coach beginner players (51%). With respect to the age group that the participants spent most time coaching, 38% reported to coaching students in the age bracket of 6-8 years, 26% stated that they coached players between 4-5 years of age and 22% indicated that they spent most time coaching students aged between 9-11 years of age.

Gender of participants

Figure 4.1 presents the percentage responses of participants who were male and female in this study. Over 80% (n=171) of the coaches were male, while females constituted 17.79% (n=37) of the participants. These figures share remarkable similarities when compared to the total percentage of males and females that have completed the JD and CP coaching courses since 2005. From 2005 to the time when the coaches were recruited for this study (2009) 82% of course participants have been male and 13% have been female.

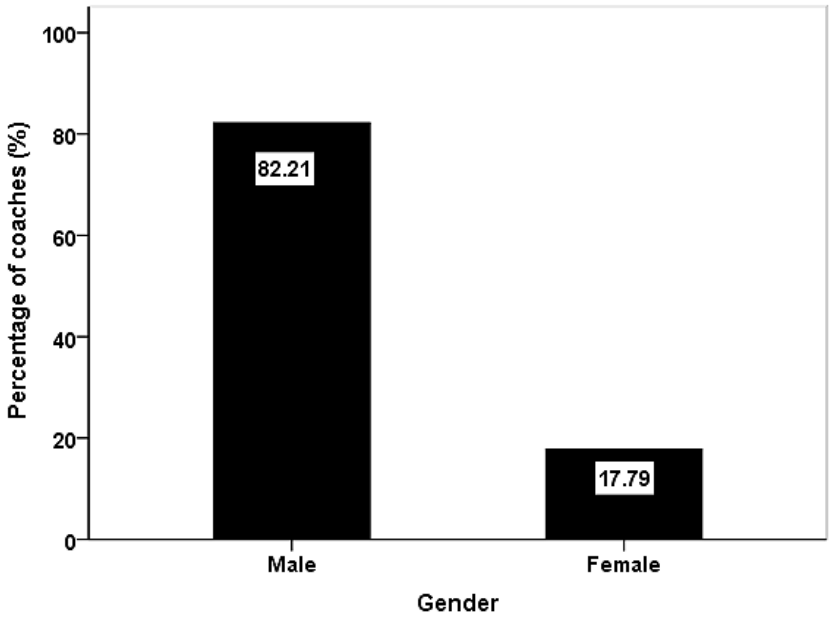

Figure 4.1: Percentage responses about the gender of participants.

Age of participants

Figure 4.2 illustrates the percentage responses of coaches in various age brackets. The largest percentage of coaches (40.87%) (n=85) was aged between 20 and 29 years old, with almost 34% (n=69) of coaches aged in the 15 to 19 years age bracket. The age bracket of 30 to 39 represented just fewer than 15% of coaches, while 7.21% (n=15) of coaches reported to being aged between 40 and 49 years at the time of the study. The smallest percentage of coaches was in the 50 plus age category (3.85%).

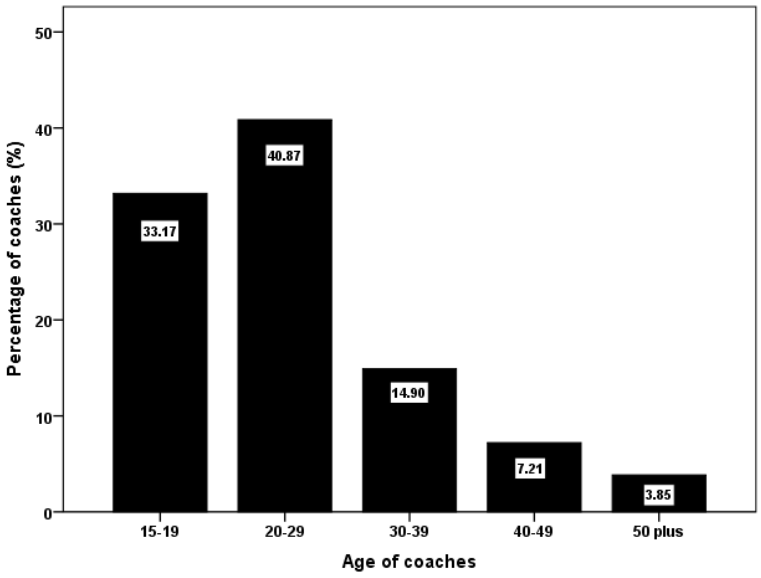

Figure 4.2: Percentage responses about the age of participants.

State or territory where the participants currently coach

Figure 4.3 presents information on the state or territory where the participants currently coach. The largest percentage of participants (60.10%) (n=125) currently coach in Victoria. Approximately 20% of participants presently coach in New South Wales (21.63%) while 10.10% (n=21) of the respondents coach in Queensland. The remaining participants coach in South Australia (3.37%) and Western Australia (4.81%) (n=10). Despite the best efforts of the researcher, coaches from some States and territories in Australia were not represented in this study. There are two primary reasons for this occurrence. In the first instance, the enrolments for some of the courses were deemed exceedingly low and therefore the course was not conducted. Another reason relates to the number of formal coach accreditation courses that individual states and territories conduct each year. It has been acknowledged that the large majority of tennis coaches in Australia reside and work in Victoria (VIC), New South Wales (NSW) and Queensland (QLD).

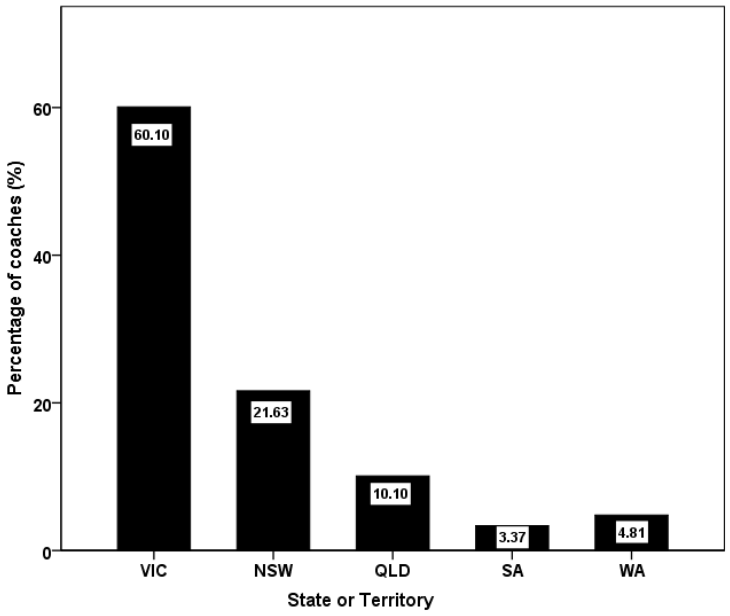

Figure 4.3: Percentage responses about the State or Territory in which the participants currently coach.

Highest educational qualification of the participants

Figure 4.4 shows percentage responses of the participants' highest educational qualification. Almost 43% (n=88) of coaches reported secondary school as their highest qualification. Undergraduate degrees constituted 27.88%, while certificate or diploma was the third highest educational qualification of the respondents in this study. A significantly smaller percentage (5.29%) (n=11) was recorded for trade or apprenticeship, postgraduate degree (3.37%) and master's degree (3.85%) (n=8). None of the coaches reported to having completed a doctoral qualification.

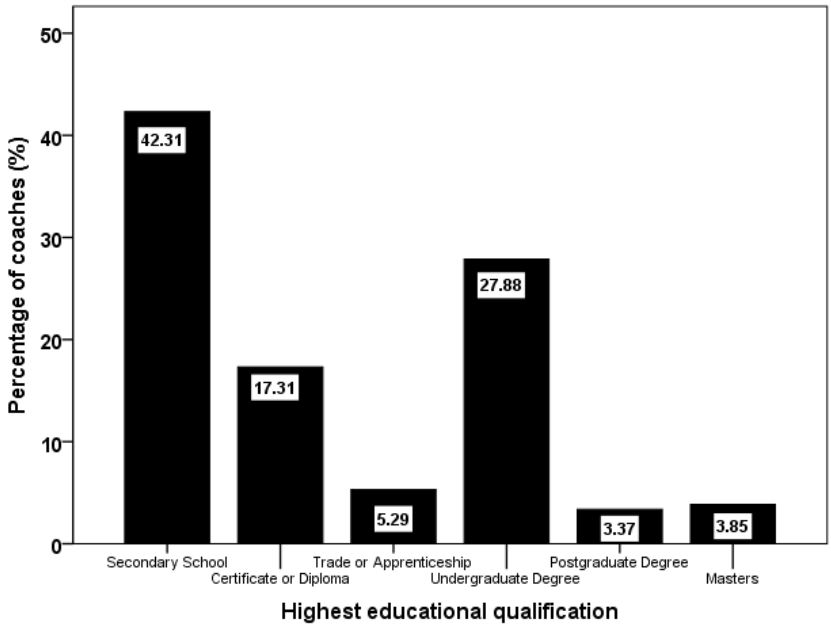

Figure 4.4: Percentage responses about the participants' highest educational qualification.

Coaching course that participants are currently completing

Information outlining the coaching course that participants were currently completing is displayed in **Figure 4.5**. Over 60% of the coaches in this study were currently completing the JD coaching course. A smaller percentage of the participants (37.5%) (n=78) were involved in the CP coaching course conducted by TA.

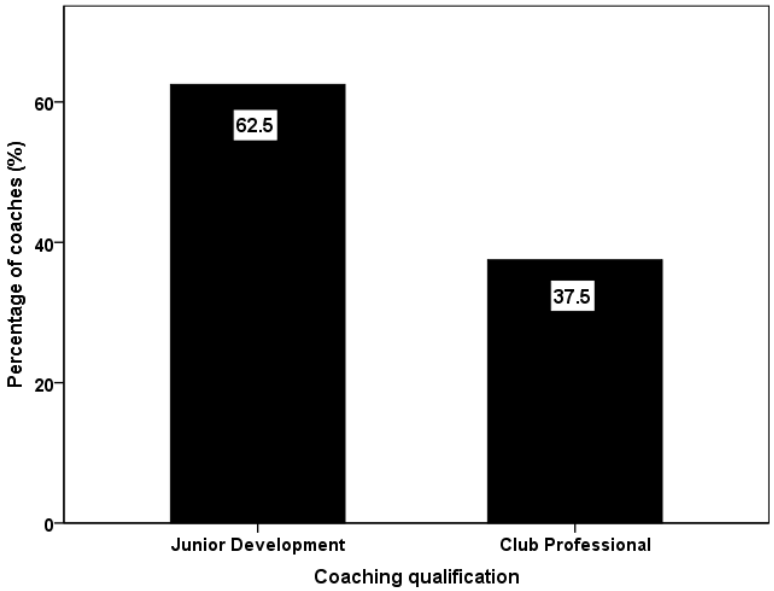

Figure 4.5: Percentage responses about the coaching course that participants are currently completing.

Number of years the participants have been coaching

Figure 4.6 shows the percentage responses of the number of years that participants have been coaching. The range 0-3 years of coaching was reported by almost 50% of all coaches in this study. This is followed by four to ten years of coaching (34.13% of coaches) (n=71) and 11 to 20 years coaching (11.06% of participants). Approximately 6% (n=12) of coaches in this study have been coaching for 20 years and over.

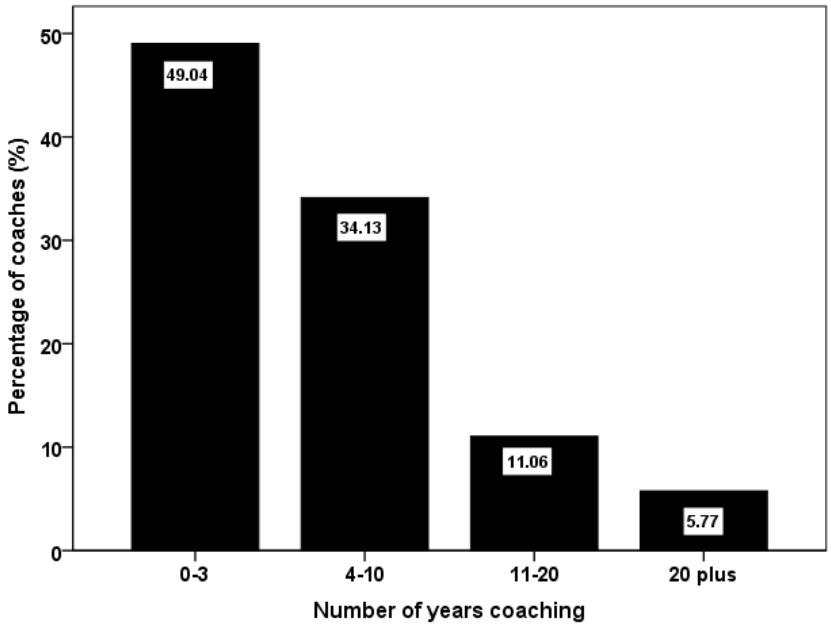

Figure 4.6: Percentage responses about the number of years that participants have been coaching.

Number of hours the participants spent coaching per week

Percentage responses on the number of hours that participants spent coaching tennis per week are found in **Figure 4.7**. Almost 35% (n=69) of the participants coached between 11 and 20 hours per week. Approximately 20% of the respondents coached between 21 to 30 hours a week. Similar percentages were found for participants coaching between 1-4 hours per week (18.27%) and 5-10 hours per week (19.71%). Less than 8% of the coaches involved in this study coached 31-40 hours per week, while less than 1% (n=2) of the participants coached 41 hours or more per week.

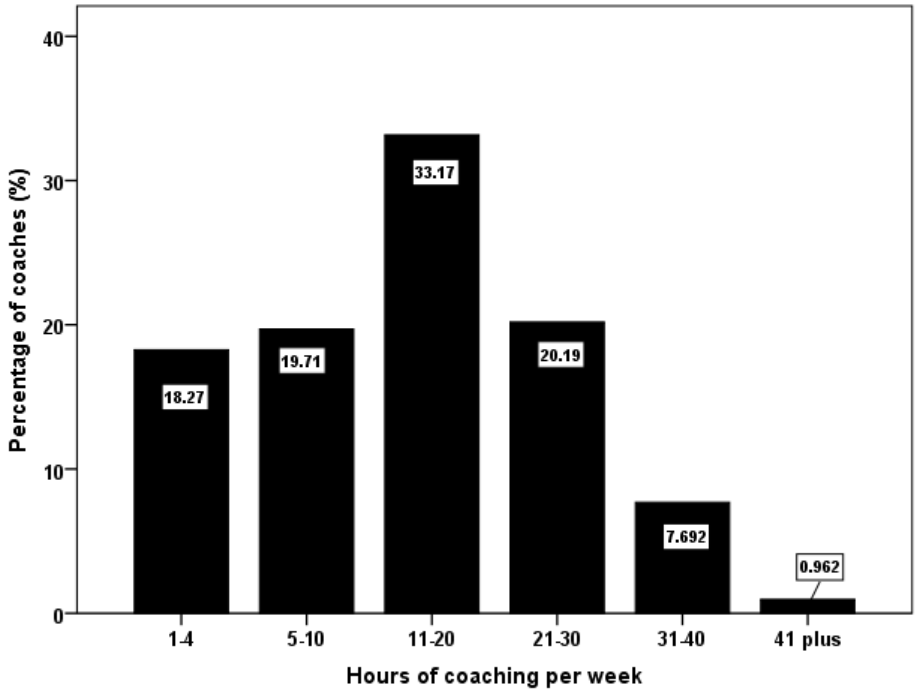

Figure 4.7: Percentage responses about the number of hours that participants spent coaching per week.

Age group that participants spent coaching per week

The percentage of participants that coach players from various age categories is outlined in **Figure 4.8**. The age group category that coaches spent most time coaching per week was 6-8 years. Almost 40% of the participants reported to mainly coaching this age group during the week. The second highest age category was the 4-5 age group, which was reported by approximately 26% of coaches (n=54). This was closely followed by the 9-11 age group (22.60% of coaches). A little over 8% of coaches stated that they coached students in the age group of 12-14 years. Percentage responses from the remaining two age categories (15-17 and 18 plus) constituted 2.40% and 2.88% respectively.

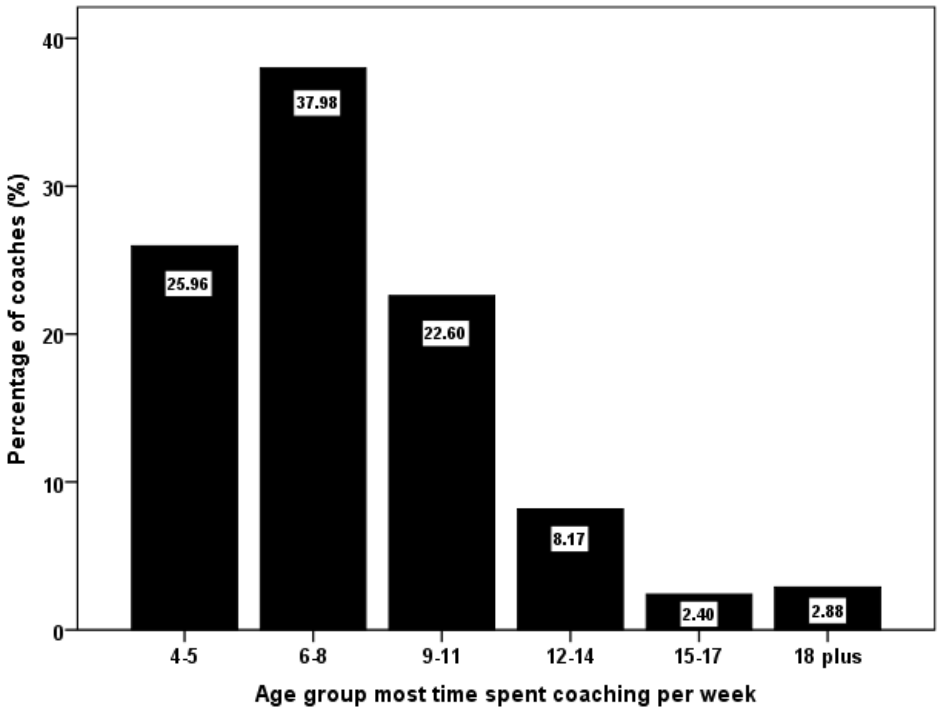

Figure 4.8: Percentage responses about the age of players that participants spent most time coaching per week.

Level that participants spent coaching per week

Percentage responses of the level that participants spent most time coaching per week are shown in **Figure 4.9**. More than half of the respondents (51.44%) reported to coaching students of a beginner level. Approximately 40% of the participants spent most of their time coaching intermediate players, while 11.06% (n=23) of the participants in this study spent the majority of their time instructing advanced level students during the week.

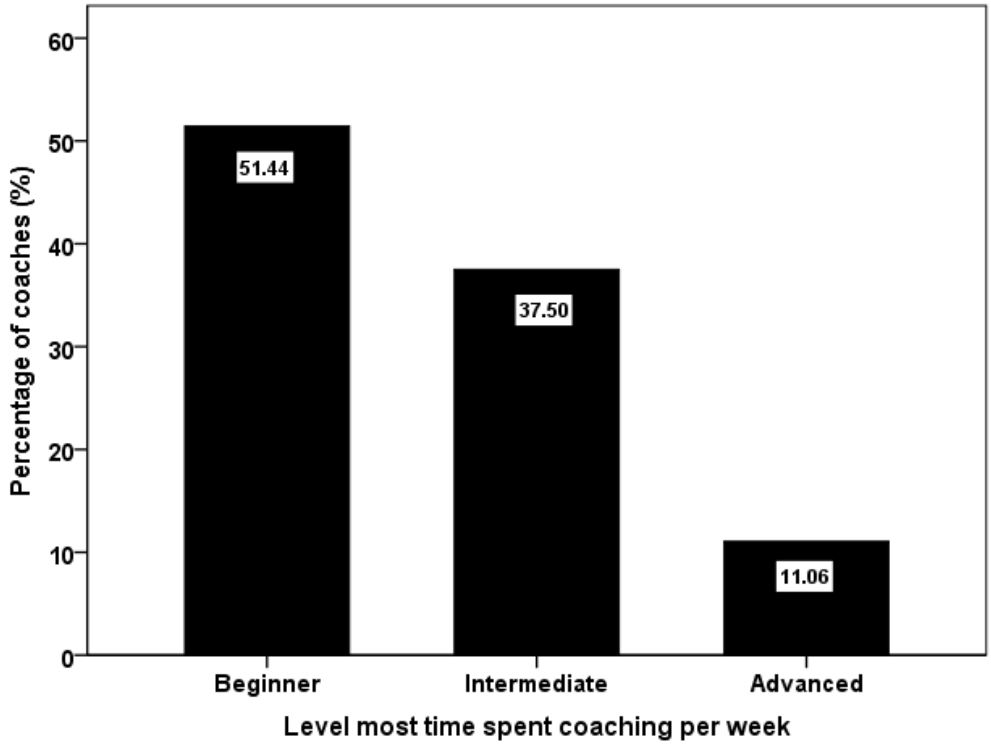

Figure 4.9: Percentage responses about the level of players that participants spent most time coaching per week.

4.1.2 General characteristics of a coach

From the results of the socio-demographic data it is possible to create a profile of a more frequently seen tennis coach that was enrolled in a Tennis Australia formal accreditation coaching course between 2009 and 2011. When looking at JD coaches in this study (n=130) as a single group, the general characteristics included:

- Male.
- Secondary school is the highest educational qualification.
- Have been coaching between 0-3 years.
- Coach tennis between 5-10 hours per week.
- Spend most time coaching players between 4-5 years of age.
- Spend most time coaching players of a beginner level.
- Are between 15-19 years of age.

When looking at CP coaches (n=78) in this study as a single group, the general characteristics were:

- Male.
- Undergraduate degree is the highest educational qualification.
- Have been coaching between 4-10 years.
- Coach tennis between 11-20 hours per week.
- Spend most time coaching players between 6-8 years of age.
- Spend most time coaching players of an intermediate level.
- Are between 20-29 years of age.

When considering the entire sample of coaches in this study as a single group (n=208) the 'typical' characteristics of a tennis coach were:

- Male.
- JD level qualified.
- Secondary school is the highest educational qualification.
- Have been coaching tennis between 0-3 years.
- Coach tennis between 11-20 hours per week.
- Spend most time coaching players between 6-8 years of age.
- Spend most time coaching beginner level players.
- Are between 20-29 years of age.

4.1.3 Part B: Coaches' self-identified use of teaching styles

The second part of the questionnaire (**Part B**) provided one question relating to the *description inventory of teaching styles.* (Hewitt, Edwards, & Ashworth, 2011). The question was: *'How frequently do I use this teaching style in my coaching sessions throughout the year?*' A five-point rating scale was used for participant ratings. The items used for the question consisted of: *not at all, minimally, here and there, often and most of the time* **(Figure 4.10**). This component of the study was specifically designed to address the first research question:

1. What teaching styles do Junior Development (JD) and Club Professional (CP) tennis coaches in Australia believe they are using during coaching sessions throughout the year?

Various tables and figures illustrating the percentage responses of coaches from the information gathered in **Part B** of **Stage 1** (survey questionnaire) are now presented. The full survey questionnaire is in **Appendix A**.

Landmark Teaching Style	**Scenario Description of Landmark Teaching Style**				
A	The students perform the task, selected by the coach, in a unison, choreographed, or precision performance image following the exact pacing (cues) set by the coach.				
How frequently do I use this landmark teaching style in my coaching sessions throughout the year?	**Not at all**	**Minimally**	**Here and there**	**Often**	**Most of the time**
	1	**2**	**3**	**(4)**	**5**

Figure 4.10: An example of one scenario description from the description inventory of landmark teaching styles which shows a five-point rating scale used to measure how frequently a teaching style was used (Hewitt, Edwards & Ashworth, 2011).

Participants in the survey questionnaire had been requested to first read the *scenario description* that provides a depiction of the image of each of the teaching styles (Mosston & Ashworth, 2008). Participants were then requested to indicate how

often they used this teaching style in their coaching sessions throughout the year. **Table 4.1** shows the breakdown of responses for data collected with the survey questionnaire. The teaching styles from *The Spectrum* are listed in the first column.

Table 4.1: The total breakdown and percentages of all tennis coaches' self-identified usage of teaching styles after reading the scenario descriptions (n=208)

Self-Identified usage of teaching styles by all tennis coaches' after reading the scenario descriptions (n=208)											
Teaching Style	***Not at All***	**%**	***Minimally***	**%**	***Here and There***	**%**	***Often***	**%**	***Most of the Time***	**%**	**Total coaches**
Command Style-A	**4**	**1.9**	**36**	**17.3**	**62**	**29.8**	**93**	**44.7**	**13**	**6.3**	**208**
Practice Style-B	**3**	**1.4**	**25**	**12**	**58**	**27.9**	**100**	**48.1**	**22**	**10.6**	**208**
Reciprocal Style-C	**43**	**20.7**	**73**	**35.1**	**55**	**26.4**	**33**	**15.9**	**4**	**1.9**	**208**
Self-Check Style-D	**40**	**19.2**	**62**	**29.8**	**62**	**29.8**	**42**	**20.2**	**2**	**1.0**	**208**
Inclusion Style-E	**49**	**23.6**	**56**	**26.9**	**48**	**23.1**	**51**	**24.5**	**4**	**1.9**	**208**
Guided Discovery-F	**15**	**7.2**	**40**	**19.2**	**57**	**27.4**	**78**	**37.5**	**18**	**8.7**	**208**
Convergent Discovery Style-G	**26**	**12.5**	**52**	**25.0**	**81**	**38.9**	**42**	**20.2**	**7**	**3.4**	**208**
Divergent Discovery Style-H	**9**	**4.3**	**39**	**18.8**	**84**	**40.4**	**67**	**32.2**	**9**	**4.3**	**208**
Learner Designed Individual Program Style-I	**57**	**27.4**	**76**	**36.5**	**54**	**26.0**	**20**	**9.6**	**1**	**0.5**	**208**
Learner Initiated Program Style-J	**63**	**30.3**	**85**	**40.9**	**50**	**24.0**	**9**	**4.3**	**1**	**0.5**	**208**
Self-Teaching Style-K	**73**	**35.1**	**69**	**33.2**	**51**	**24.5**	**14**	**6.7**	**1**	**0.5**	**208**

A general overview of the results from **Part B** of the survey questionnaire has indicated that coaches reported to using two teaching styles in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) most frequently during coaching sessions throughout the year. These included coaching and learning behaviours that approximated Command Style-A (51%) and Practice Style-B (58%). The coaches also reported to using coaching and learning behaviours that approximated Guided Discovery-F (46%). This teaching style is located in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) and was the third most commonly used teaching style.

The Spectrum (Mosston & Ashworth, 2008) identifies two basic thinking capacities that consist of "the capacity for *reproduction* and the capacity for *production"* (Mosston & Ashworth, 2008, p. 9). All individuals have, in varying degrees, the capacity to reproduce known knowledge, replicate models, recall information, and practice skills. Additionally, all individuals have the capacity to produce a range of new ideas. The first five landmark teaching styles (Command Style-A, Practice Style-B, Reciprocal Style-C, Self-Check Style-D, and Inclusion Style- E) form a *cluster* that represents teaching options that foster *reproduction* of existing (known, past) information and knowledge. The information to be learned can also be new to the learner but the content is fixed, specific, a model or procedure.

The remaining landmark teaching styles (Guided Discovery Style-F, Convergent Discovery Style-G, Divergent Discovery Style-H, Learner-Designed Individual Program Style-I, Learner-Initiated Style-J, and Self-Teaching Style-K) form a *cluster* that represents options that invite *production* (discovery) of new knowledge. This knowledge is new to the learner, and it may be new to the teacher, or at times, new to society (Mosston & Ashworth, 2008). The following information provides a more detailed account of the participants' responses with regard to the frequency they reportedly employed each of the teaching styles on *The Spectrum* (Mosston & Ashworth, 2008). As outlined previously, the *description inventory of landmark teaching styles* provided a *scenario description* of each of the 11 teaching styles. These *scenario descriptions* provide unequivocal descriptions that closely portray the image of each of the 11 teaching styles (Mosston & Ashworth, 2008).

The scenario descriptions used in this study are outlined in the survey questionnaire in **Appendix A**. The information presented in the next section relates to **Table 4.1**.

Command Style-A

Over 51% (n=106) of the participants reported to using Command Style-A from *often to most of the time* during their coaching sessions throughout the year. While only four coaches (1.9%) from the total sample (n=208) reported to not employing this style at any stage during coaching sessions, almost 30% indicated that they employed this style *here and there*. Overall, Command Style-A was the second most prevalent teaching style used by coaches.

Practice Style-B

Practice Style-B was the most frequently reported teaching style by coaches in this study. Approximately 60% of the participants stated that they employed this style from *often to most of the time.* Twenty-five coaches (12.0%) reported to using this style *minimally,* while only three coaches (1.4%) from the overall sample of 208 said that they did not use this style at all during coaching sessions throughout the year.

Reciprocal Style-C

A total of 37 coaches or 17.8% of participants revealed that they employed this teaching style from *often to most of the time*. A larger percentage of the study's sample indicated they used this style *here and there* (26.4%) while the majority of coaches (35.1%) (n=73) stated that during their coaching sessions, Reciprocal Style-C was implemented *minimally*. A total of forty-three coaches (20.7%) did not use this style at all during coaching sessions.

Self-Check Style-D

A total of 42 coaches (20.2%) claimed to have employed this teaching style *often*, with 1% of the sample reporting most of the time. While, a total of 19.2% of coaches did not employ Self-Check-D at all during the course of their coaching sessions throughout the year, while 29.8% of the participants (n=62) indicated that they used this style *minimally* and *here and there*.

Inclusion Style-E

While less than 2% of the total sample (n=208) believed they employed this teaching style *most of the time,* approximately 26% of the coaches reported to using this style during coaching sessions throughout the year for each of the remaining frequency rating indicators, (*not at all* = 23.6%, *minimally* = 26.9%, *here and there* = 23.1%, *often* = 24.5%).

Guided Discovery Style-F

The third most used teaching style as reported by coaches was Guided Discovery-F. Almost 50% of the participants employed this style *often to most of the time* during lessons. While 57 coaches (27.4%) revealed that they used this style *here and there*, 15 participants (7.2%) indicated that they did not employ this style at all when coaching.

Convergent Discovery Style-G

While only seven coaches (3.4%) of 208 participating in this study reported to using Convergent Discovery Style-G *most of the time*, 81 coaches (38.9%) indicated that they employed this teaching style *here and there*, while 20.2% of the participants claimed to apply this style *often*. A smaller number of the sample (n=52)

or 25.0% identified that they used this style *minimally* during coaching sessions. Overall, twenty-six coaches (12.5%) did not use this teaching style at all during coaching sessions.

Divergent Discovery Style-H

Results concluded that Divergent Discovery Style-H was the fourth most identified teaching style among the whole sample of 208 tennis coaches (46.5%). Despite this, only nine coaches (4.3%) indicated that they employed this style *most of the time* with 67 of the participants (32.2%) reporting its use *often*. A larger proportion (n=84) or 40.4% suggested that they employed this style *here and there*, with 39 (18.8%) indicating its application during coaching sessions *minimally*. Only a small percentage of the total sample indicated that they did not utilise this teaching style for any length of time during their coaching sessions (4.3%).

Learner Designed Individual Program Style-I

Despite only one coach indicating that they used this style *most of the time*, and only 20 participants (9.6%) reporting its use *often* during coaching sessions throughout the year, over a quarter of the total sample of respondents (n=54) or 26.0% believed that they employed this teaching style *here and there*. However, a far greater number of coaches (n=133) or 63.9% stated that they only practised this teaching style from *minimally* to *not at all*.

Learner Initiated Program Style-J

Participants in this study identified Learner Initiated Program Style-J as the least employed teaching style from *often to most of the time* with ten coaches or 4.8%. Despite 50 coaches (24.0%) indicating that they used this teaching style *here and there* during coaching sessions throughout the year, results showed that 19.8% coaches from the total of 208 employed this teaching style from *minimally* to *not at all*.

Self-Teaching Style-K*

The results for Self-Teaching Style-K share commonalities with those found for Learner Initiated Style-J. Just over 7% of coaches in this study indicated that they employed this teaching style from *often* to *most of the time* during coaching sessions throughout the year. A total of 193 of the participants (92.8%) divided their responses among *here and there* (n=51) (24.5%), *minimally* (n=69) (33.2%) and *not at all* (n=73) (35.1%).

* This teaching style does not exist in the classroom or coaching session

4.1.4 A comparison of Junior Development (JD) and Club Professional (CP) coaches

A percentage comparison of the self-identified teaching styles of JD coaches as a single group (n=130), CP coaches as single group (n=78) as well as all the coaches (n=208) who reported using the teaching styles, *most of the time* to *often* is shown in **Table 4.2**.

Table 4.2: Percentage of JD (n=130), CP (n=78) and all tennis coaches' (n=208) self-identified use of teaching styles *often* to *most of the time*.

Landmark Teaching Styles	**Percentage of JD tennis coaches' self-identified use of landmark teaching styles*: often* to *most of the time* (n=130)**	**Percentage of CP tennis coaches' self-identified use of landmark teaching styles: *often* to *most of the time* (n=78)**	**Percentage of all coaches' self-identified use of teaching styles: *often* to *most of the time* (n=208)**
Command Style-A	**50.3%**	**52.8%**	**51%**
Practice Style-B	**60.1%**	**63.5%**	**58.7%**
Reciprocal Style-C	**15.1%**	**20.3%**	**17.8%**
Self-Check Style-D	**19.8%**	**20.3%**	**23.1%**
Inclusion Style-E	**23.1%**	**32.4%**	**26.4%**
Guided Discovery Style-F	**41.8%**	**41.9%**	**56%**
Convergent Discovery Style-G	**22%**	**23%**	**23.6%**
Divergent Discovery Style-H	**27.5%**	**45.9%**	**36.5%**
Learner Designated Individual Program Style-I	**8.8%**	**8.2%**	**10.1%**
Learner Initiated Program Style-J	**5.5%**	**0%**	**4.8%**
Self-Teaching Style-K	**11%**	**1.4%**	**7.2%**

The data shows that JD and CP tennis coaches in Australia largely self-identified similar teaching styles from *often* to *most of the time* in their coaching sessions throughout the year. Exceptions greater than 10% between the two cohorts can be seen with the use of Divergent Discovery Style-H (JD=31.5%, CP=44.9%). Practice Style-B is the most prevalent teaching style used by all of the coaches. This teaching style was employed from *often* to *most of the time* by over 60% of the participants. Results also revealed that JD and CP coaches reported spending most of their time using teaching styles located in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008). With the exception of the Divergent Style-H and the Self- Teaching Style-K, participants from both formal accreditation coaching courses reported similar frequencies of teaching style usage.

The data relating to the coaches' self-identified use of teaching styles were initially measured on a 5 point rating scale where 1=*not at all*, 2=*minimally*, 3=*here and there*, 4=*often* and 5=*most of the time*. From this, the coaches' mean responses were able to be calculated. Descriptive statistics shown in **Table 4.3** indicate that when looking at all coaches as a single group (n=208) on average they reported using teaching styles Practice Style-B (Mean=3.54), Command Style-A (Mean=3.36), Guided Discovery-Style-F (Mean=3.21) and Divergent Discovery-H (Mean=3.13) most frequently, that is between *here and there* (3) and *often* (4). The mean responses also indicated that coaches generally reported using Learner Initiated Style-J (Mean=2.04) and Self-Teaching Style-K (Mean=2.04) less often, between *minimally* (2) and *here and there* (3).

Table 4.3: Means, Standard Deviations, Medians and, 25th and 75th Percentiles for JD and CP tennis coaches' self-identified use of teaching styles recorded on a rating scale from *not at all* (1) to *most of the time* (5) (n=208).

Teaching Style	Mean	SD	Median	25th Percentile	75th Percentile
Command Style-A	**3.36**	**.906**	**4.00**	**3.00**	**4.00**
Practice Style-B	**3.54**	**.889**	**4.00**	**3.00**	**4.00**
Reciprocal Style-C	**2.43**	**1.047**	**2.00**	**2.00**	**3.00**
Self-Check Style-D	**2.54**	**1.049**	**3.00**	**2.00**	**3.00**
Inclusion Style-E	**2.54**	**1.154**	**2.00**	**2.00**	**4.00**
Guided Discovery Style-F	**3.21**	**1.078**	**3.00**	**2.00**	**4.00**
Convergent Discovery Style-G	**2.77**	**1.019**	**3.00**	**2.00**	**3.00**
Divergent Discovery Style-H	**3.13**	**.917**	**3.00**	**3.00**	**4.00**
Learner Designed Individual Program Style-I	**2.19**	**.964**	**2.00**	**1.00**	**3.00**
Learner Initiated Style-J	**2.04**	**.873**	**2.00**	**1.00**	**3.00**
Self-Teaching Style-K	**2.04**	**.955**	**2.00**	**1.00**	**3.00**

Descriptive statistics shown in **Table 4.4** indicate that when looking at JD coaches as a single group (n=130) they reported very similar responses to all participants in the study (n=208) (**Table 4.1**). The mean self-identified usage was again highest for Practice Style-B (Mean=3.51), Command Style-A (Mean=3.40), Guided Discovery-F (Mean=3.25) and Divergent Style-H (Mean=3.03). The mean self-identified usage was lowest for Learner Initiated Style-J (Mean=2.12) and Self-Teaching Style-K (Mean=2.22).

Table 4.4: Means, Standard Deviations, Medians and, 25th and 75th Percentiles for JD tennis coaches' self-identified use of teaching styles recorded on a rating scale from *not at all* (1) to *most of the time* (5) (n=130).

Teaching Style	Mean	SD	Median	25th Percentile	75th Percentile
Command Style-A	**3.40**	**.912**	**3.00**	**3.00**	**4.00**
Practice Style-B	**3.51**	**.925**	**4.00**	**3.00**	**4.00**
Reciprocal Style-C	**2.33**	**1.059**	**2.00**	**1.00**	**3.00**
Self-Check Style-D	**2.51**	**1.073**	**2.00**	**2.00**	**3.00**
Inclusion Style-E	**2.43**	**1.174**	**2.00**	**1.00**	**3.00**
Guided Discovery Style-F	**3.25**	**1.050**	**3.00**	**3.00**	**4.00**
Convergent Discovery Style-G	**2.75**	**1.044**	**3.00**	**2.00**	**3.00**
Divergent Discovery Style-H	**3.03**	**.906**	**3.00**	**2.75**	**4.00**
Learner Designed Individual Program Style-I	**2.08**	**1.004**	**2.00**	**1.00**	**3.00**
Learner Initiated Style-J	**2.12**	**.937**	**2.00**	**1.00**	**3.00**
Self-Teaching Style-K	**2.22**	**.996**	**2.00**	**1.00**	**3.00**

Descriptive statistics shown in **Table 4.5** indicate that when looking at CP coaches as a single group (n=78) they reported very similar responses to all the participants in the study (n=208) (**Table 4.1**) with respect to the teaching styles used most frequently: Practice Style-B (Mean 3.60) the most frequently reported, followed by Command Style-A (Mean=3.29). Guided Discovery Style-F (Mean=3.15) and Divergent Style-H (Mean=3.31). The average self-identified usage of Learner Initiated Style-J (Mean=1.91) and Self-Teaching Style-K (Mean=1.76) were lower for CP coaches than the group as a whole, i.e., between *not at all* (1) and *minimally* (2).

Table 4.5: Means, Standard Deviations, Medians and, 25th and 75th Percentiles for CP tennis coaches' self-identified use of teaching styles recorded on a rating scale from *not at all* (1) to *most of the time* (5) (n=78).

Teaching Style	Mean	SD	Median	25th Percentile	75th Percentile
Command Style-A	**3.29**	**.899**	**4.00**	**3.00**	**4.00**
Practice Style-B	**3.60**	**.827**	**4.00**	**3.00**	**4.00**
Reciprocal Style-C	**2.60**	**1.011**	**2.50**	**2.00**	**3.00**
Self-Check Style-D	**2.59**	**1.012**	**3.00**	**2.00**	**3.00**
Inclusion Style-E	**2.73**	**1.101**	**3.00**	**2.00**	**4.00**
Guided Discovery Style-F	**3.15**	**1.129**	**3.00**	**2.00**	**4.00**
Convergent Discovery Style-G	**2.81**	**.981**	**3.00**	**2.00**	**3.25**
Divergent Discovery Style-H	**3.31**	**.916**	**3.00**	**3.00**	**4.00**
Learner Designed Individual Program Style-I	**2.37**	**.870**	**2.00**	**2.00**	**3.00**
Learner Initiated Style-J	**1.91**	**.742**	**2.00**	**1.00**	**2.00**
Self-Teaching Style-K	**1.76**	**.809**	**2.00**	**1.00**	**2.00**

In order to determine if there was a significant difference between the calculated means, a series of t-tests were performed. For each teaching style a t-test was employed to test the difference in means between JD and CP coaches with regard to their self-identified usage of teaching styles during coaching sessions throughout the year. It was revealed that statistically significant differences ($P<0.05$) existed between the self-identified use of Divergent Discovery Style-H by JD coaches (Mean=3.03) and CP coaches (Mean=3.31), Learner Designed Individual Program Style-I by JD coaches (Mean=2.08) and CP coaches (Mean=2.37), and Self-Teaching Style-K by JD coaches (Mean=2.22) and CP coaches (Mean=1.76). A non-parametric equivalent test (Mann Whitney test), which tests the differences between medians rather than between means were also conducted. Significant differences ($P<0.05$) were found between CP and JD coaches for Learner Designed Individual Program-I and Self-Teaching Style-K. There were no significant differences found between JD and CP coaches for Divergent Style-H ($P>0.05$). Although statistically significant, many of these differences in mean and median values were quite small in a practical sense and for Divergent Discovery Style-H and Program Style-I did not reflect a change in category on the initial rating scale where 1=*not at all*, 2=*minimally*, 3=*here and there*, 4=*often* and 5=*most of the time*.

Statistical tests were also employed to explore the differences in mean responses from all the coaches as a single group (n=208) with regard to their self-identified usage of teaching styles and:

- The level of players the coaches spent most time coaching (beginner; intermediate or advanced).
- The age group the coaches spent most time coaching (4-5, 6-8, 9-11, 12-14, 15 plus).
- The number of hours the coaches spent coaching per week (1-10, 11-30, 31 plus).
- The number of years the coaches had been coaching (0-3, 4-10, 11-20, 21 plus).

As there were multiple categories to compare, one-way ANOVA and post-hoc LSD tests were used for the purposes of comparison. Results from these tests revealed that statistically significant differences (P<0.05) existed between the self-identified usage of Command Style-A and the age groups 6-8 (Mean=3.61) and 9-11 (Mean= 3.00). Statistically significant differences (P<0.05) also existed between Divergent Discovery Style-H and the number of hours of coaching per week. These included: 1-4 hours (Mean=2.87), 21-30 hours (Mean=3.45) and 31-40 hours (Mean=3.69). Statistically significant differences were also evident between Divergent Style-H and 5-10 hours (Mean=2.88) and 21-30 hours (Mean=3.45) and 31-40 hours (Mean=3.69). With regard to the coaches' years of coaching experience statistically significant differences (P<0.05) were shown in Self-Teaching Style-K and the category of 0-3 years of coaching (Mean=2.25) and 4-10 years of coaching experience Mean=1.76). A one-way analysis of variance (ANOVA) and a post-hoc LSD test was additionally conducted for self-identified usage of teaching styles and the level or ability of students the coaches in this study spent most time coaching during coaching sessions throughout the year. Results of this test demonstrated that a statistically significant difference (P<0.05) was evident between the coaches' employment of Learner Designated Individual Program Style-I and for beginner students (Mean=1.98) and advanced students (Mean=2.70).

In addition to exploring the differences in the mean responses of coaches in regards to teaching styles and, level of students, age of students, hours of coaching, and years of coaching, statistical tests were also employed to explore any differences in who the coaches were coaching. This required a test that could explore the association between two categorical variables (i.e., coaching qualification and one other). Chi-square tests were performed in order to determine whether there was a significant association between coaching qualification (JD, CP) and:

- The level of players the coaches spent most time coaching (beginner, intermediate or advanced).
- The age group the coaches spent most time coaching (4-5, 6-8, 9-11, 12-14, 15 plus).
- The number of hours the coaches spent coaching per week (1-10, 11-30, 31 plus).
- The number of years the coaches had been coaching (0-3, 4-10, 11-20, 21 plus).

The results of these tests revealed that a significant association was found between the coaches' coaching qualification and all four variables listed above. The results indicated a significant association between coaching qualification and the amount of hours the coaches worked each week ($X_2^2 = 44.90$, p<0.001). **Figure 4.11** shows the

comparison between the number of hours worked each week by JD and CP coaches. JD coaches (n=130) mostly worked between 1-10 hours (n=72) (34.62%), followed by 11-30 hours (n=51) (24.52 %), and 31 plus hours (n=7) (3.37%). CP coaches (n=78) mostly worked between 11-30 hours per week (n=60) (28.85%), this was followed by 31 plus hours (n=11) (5.29 %), and lastly 1-10 hours (n=4) (3.37%).

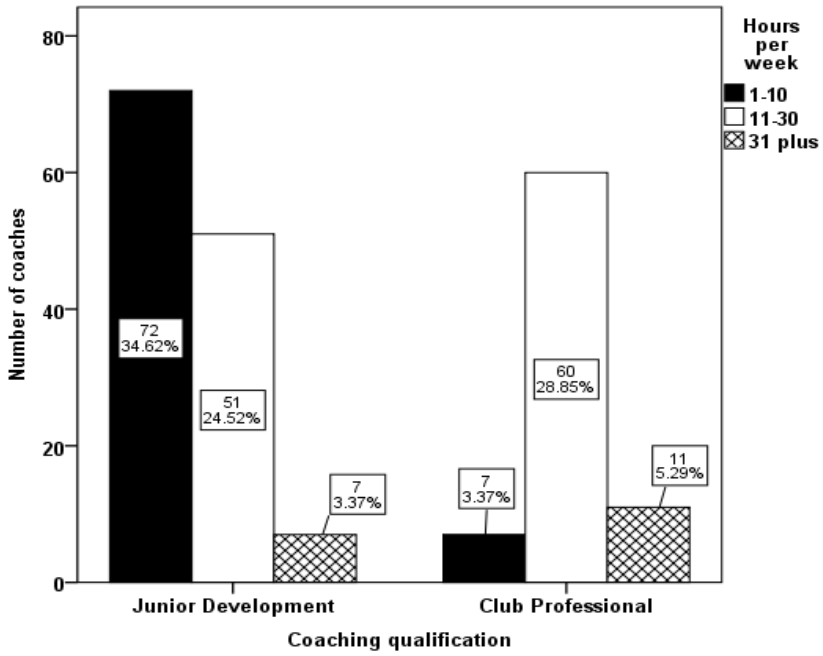

Figure 4.11: A comparison of coaching qualification and the number of hours coaching per week.

A significant association was also found between coaching qualification and the level of players the coaches spent most time coaching ($X_2^2 = 30.32$, p<0.001). **Figure 4.12** illustrates the level of players that JD and CP coaches spent most time coaching each week. The JD coaches spent the majority of their time coaching beginner players (n=82) (39.42%), then intermediate players (n=44) (21.15%), followed by players of an advanced level (n=4) (1.92%). The greatest proportion of CP coaches spent time instructing intermediate players (n=34) (16.35%), followed by beginner players (n=25) (12.02%), then advanced players (n=19) (9.13%).

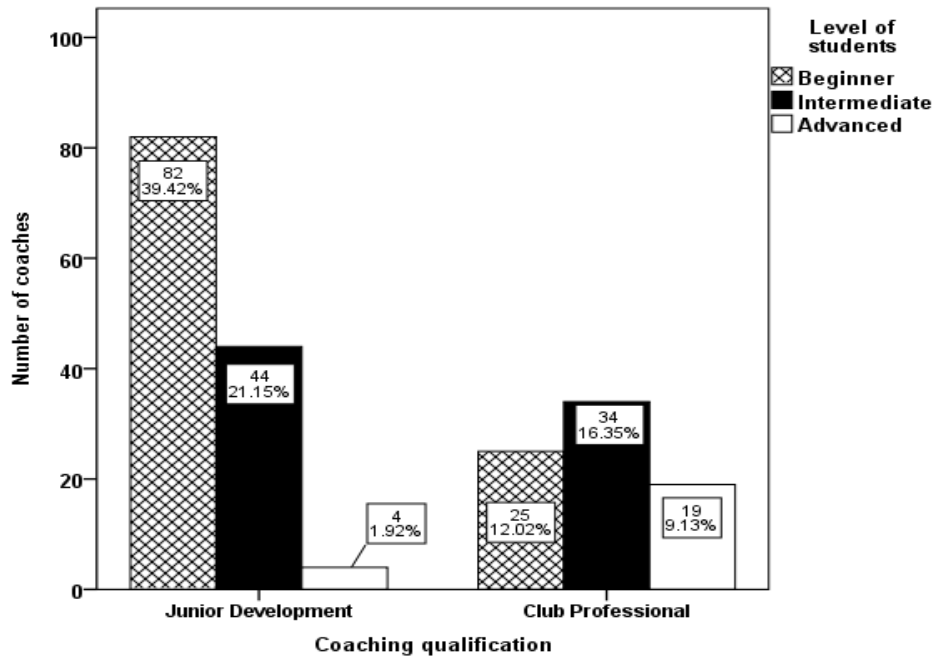

Figure 4.12: A comparison of coaching qualification and the level of players whom coaches spent most time coaching.

The chi-square tests also revealed that a significant association was evident between coaching qualification and the number of years of coaching ($X_3^2 = 101.97$, p<0.001). It was found that most of the JD coaches had been coaching for 0-3 years (n=98) (47.12%), followed by 4-10 years (n=27) (12.98%), 11-20 years (n=3) (1.44%), and 21 plus years (n=2) (0.96%). It was found that the most number of CP coaches had been coaching for 4-10 years (n=44) (21.15%). This was followed by 11-20 years (n=20) (9.62%), 21 plus years (n=10) (4.81%), and 0-3 years (n=4) (1.92%) (**Figure 4.13**).

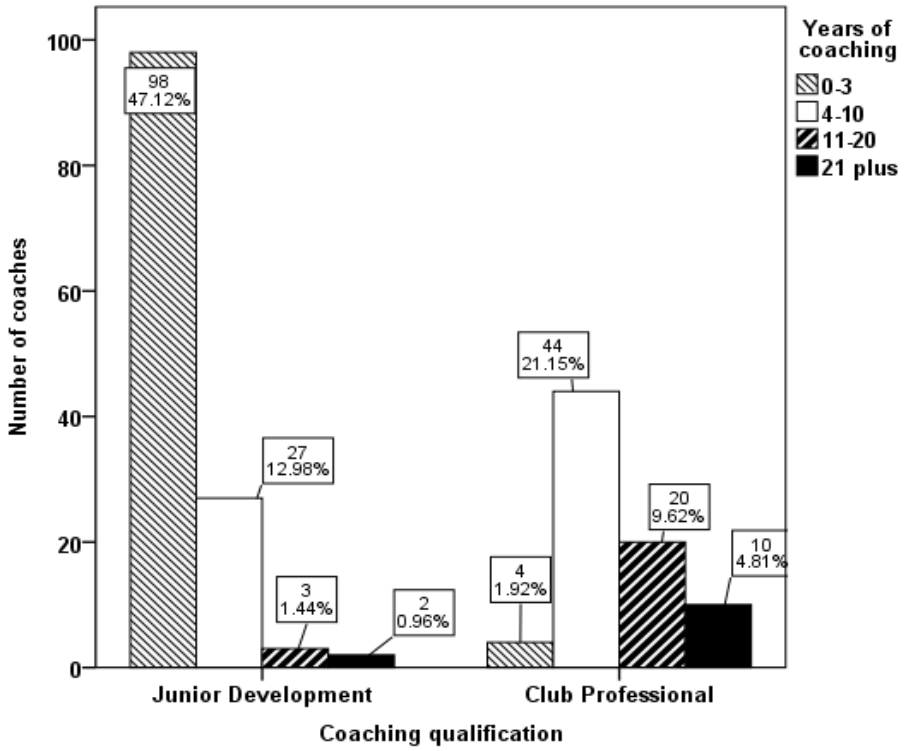

Figure 4.13: A comparison of coaching qualification and the number of years coaching.

A significant association was also found between coaching qualification and the age group the coaches spent most time coaching ($X_4^2 = 16.56$, p<0.001). A comparison between JD and CP tennis coaches in relation to the age group of students they spent most time coaching is shown in **Figure 4.14**. The greatest number of JD coaches spent most of their time coaching students in the age of 4-5 (n=45) (21.63%) and 6-8 (n=45) (21.63%). This was followed by students between the ages of 9-11 (n=25) (12.02%), 15 plus years (n=8) (3.85%) and 12-14 years (n=7) (3.37%). CP coaches in this study spent the majority of time coaching students between the ages of 6-8 (n=34) (16.35%), followed by 9-11 years (n=22) (10.58%), then 12-14 years (n=10) (4.81%), 4-5 years (n=9) (4.33%), and 15 plus years (n=3) (1.44%).

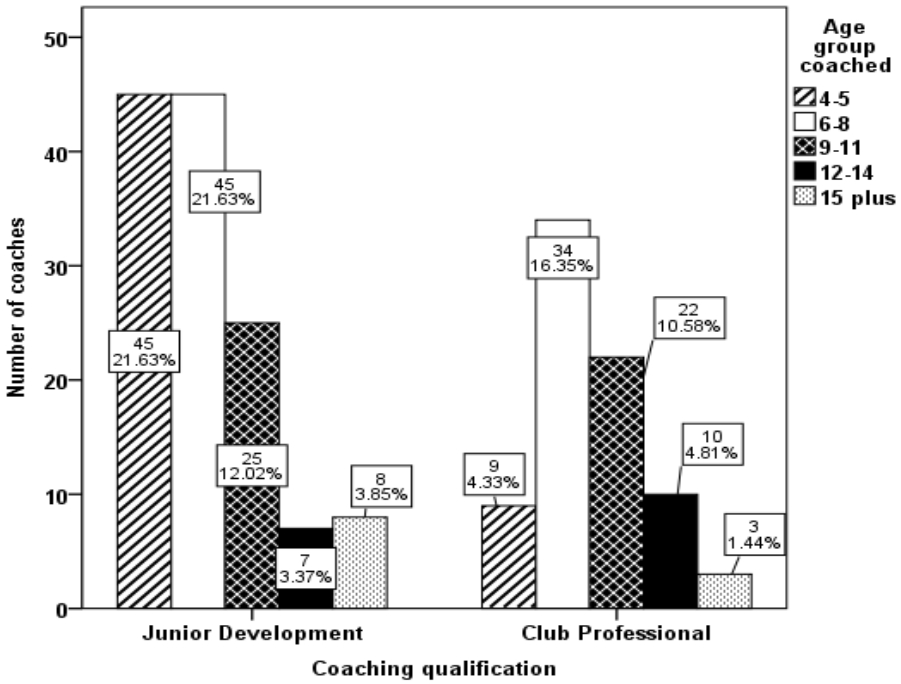

Figure 4.14: A comparison of coaching qualification and the age group of players whom coaches spent most time coaching.

4.1.5 Summary of the major findings

Overall, the coaches in this study reported to using all the teaching styles during coaching sessions. More specifically, Practice Style-B was identified as the most commonly used teaching style from *often* to *most of the time* with 122 coaches (58.7%) reporting to using this style during coaching sessions throughout the year. Over half of the coaches (n=106) in this study or 51% reported to using Command Style-A from *often* to *most of the time*. The third most commonly used teaching style was Guided Discovery-F with 96 coaches (46.2%) reportedly using this style during their coaching sessions from *often* to *most of the time*. It is interesting to reveal that when each rating scale measurement indicator (*not at all*, *minimally*, *here and there*, *often*, and *most of the time*) was ranked from highest number of responses (one) to lowest number of responses (five), Command Style-A, Practice Style-B, Inclusion Style-E and Guided Discovery-F represented the highest number of responses for the *often* rating scale measurement indicator. The *here and there* rating scale measurement indicator represented the second highest number of responses for Command Style-A, Practice Style-B, Reciprocal Style-C, Self-Check Style-D, and Guided Discovery Style-F. This measurement indicator also represented the highest number of responses for the Convergent Discovery Style-G and Divergent Discovery Style-H. The *most of the time* rating scale measurement indicator scored the fourth and fifth lowest number of responses for all teaching styles except the Self-Check Style-D that had the second highest number of responses for *most of the time.* Consistent with the individual self-identified results for each teaching style above, the Learner Designated Individual Program Style-I, Learner Initiated Program-J and Self-Teaching Style-K, scored the highest number of responses for the rating scale measurement of *not at all*.

4.2 Stage 2: Observations

The purpose of implementing observations in this study was to verify if the coaches were actually employing the teaching styles they reported using from the survey questionnaire. The questionnaire also explored the coaches' knowledge, expertise and self-awareness of the teaching styles they use during practice. This stage of the study was specifically designed to address the second research question:

2. What teaching styles are Junior Development (JD) and Club Professional tennis (CP) coaches in Australia actually using during coaching sessions?

As previously outlined, **Stage 2** of the research (observation) was designed to expand on the results reported in **Stage 1** (survey questionnaire). From the 208 coaches who completed the survey questionnaire, 56 volunteered to participate in **Stage 2** (observation) and **Stage 3** (interview). Of the 56 coaches who volunteered for **Stage 2** and **Stage 3** of the research, 13 were chosen. From this group, 12 coaches were selected to participate in three 30 minute observations during their accreditation coaching course. In order to obtain an assessment of teaching styles usage over an extended period of time, one additional coach was chosen to participate in 18 hours of observations over a six-day period at their place of work. Overall, 13 coaches were involved in **Stage 2** and **Stage 3** of the research. The observed teaching styles of the 12 coaches will be now presented. This will be followed by the observed teaching styles of the single coach during the extended observations.

4.2.1 Observed teaching styles of the 12 coaches

The results in this section of the study provide a description of the 12 coaches' observed employment of teaching styles during their three 30 minute coaching sessions. In addition, the findings concerning the single coach who were observed for an extended length of time are also outlined. **Table 4.6** shows the participant breakdown of the range of teaching styles observed during the 12 coaches' three 30 minute coaching sessions (n=36 sessions).

Table 4.6: Participant breakdown of the range of teaching styles observed during the coaches' three 30 minute coaching sessions.

Participant	Teaching styles that were observed during the 12 participants' three 30 minute coaching lessons (n=36 lessons)
Participant 1 **Junior Development**	**Landmark teaching style Command Style-A** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A**** • ***Canopy design Practice Style-B****
Participant 2 **Junior Development**	**Landmark teaching style Command Style-A** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A*** • ***Canopy design Practice Style-B***
Participant 3 **Junior Development**	**Landmark teaching style Practice Style-B** • ***Canopy design Practice Style-B***
Participant 4 **Junior Development**	**Landmark teaching style Practice Style-B** • ***Canopy design Practice Style-B***
Participant 5 **Junior Development**	**Landmark teaching style Command Style-A,** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A*** • ***Canopy design Practice Style-B***
Participant 6 **Junior Development**	**Landmark teaching style Practice Style-B** • ***Canopy design Practice Style-B***
Participant 7 **Club Professional**	**Landmark teaching style Practice Style-B** • ***Canopy design Practice Style-B***
Participant 8 **Club Professional**	**Landmark teaching style Command Style-A,** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A*** • ***Canopy design Practice Style-B***
Participant 9 **Club Professional**	**Landmark teaching style Command Style-A,** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A*** • ***Canopy design Practice Style-B***
Participant 10 **Club Professional**	**Landmark teaching style Command Style-A,** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A*** • ***Canopy design Practice Style-B***
Participant 11 **Club Professional**	**Landmark teaching style Command Style-A,** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A*** • ***Canopy design Practice Style-B***
Participant 12 **Club Professional**	**Landmark teaching style Command Style-A,** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A*** • ***Canopy design Practice Style-B***

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.

The 12 coaches were observed implementing two landmark teaching styles. These were landmark teaching style Command Style-A and landmark teaching style Practice Style-B. The coaches were also observed performing a variation of landmark teaching style Practice Style-B as well as a variation of landmark teaching style Command Style-A which are identified as canopy designs. These findings were verified by Prof. Sara Ashworth. As demonstrated previously, the two canopy design variations that approximated the decision structure of the landmark teaching styles were labelled as:

- Canopy design Command Style-A minus (-) pace and rhythm.
  The abbreviation for this notation is: **Â-P&R**.
- Canopy design Practice Style-B plus (+) a social partnership to complete the task.
  The abbreviation for this notation is: **B̂+socialisation**.

For clarity, the researcher will be referring to these canopy designs in the tables and text of this chapter using the following terms in bold and italics.

- ***Canopy design Command Style-A.***
- ***Canopy design Practice Style-B.***

These terms will be further explored and interpreted in **Chapter Five**. It is interesting to note that despite the infinite number of canopy designs that exist on *The Spectrum* (Mosston & Ashworth, 2008) this study identified only two. It can be speculated that the canopy designs that were observed in this research encompass behaviours that are most evident when learning tennis. These behaviours relate to individual technical mastery of tennis strokes as guided by the coach as well as performing a rally with a partner.

Canopy designs approximate the decision structure of the landmark teaching style(s) they are located near or between. Reasons for this discrepancy may be due to the employment of only three 30 minute coaching sessions, content of the sessions, age and ability of the players and the number of players in the group. Despite both coders having extensive practice with the coding tool and that the reliability and validity of the observations were assured by inter-observer and intra-observers' agreement, it is possible that inconsistencies were evident with regard to the coding of the sessions. All 12 coaches were observed using landmark teaching style Practice Style-B as well as a canopy design that approximates the behaviour of this landmark teaching style (***canopy design Practice Style-B***). A total of eight coaches were observed employing landmark teaching style Command Style-A in addition to a variation of this landmark teaching style (***canopy design Command Style-A***). A depiction of the breakdown of total time (%) that the participants (n=12) employed these teaching styles during their three 30 minute coaching sessions is displayed in **Table 4.7.**

Table 4.7: The breakdown of total time (%) that the 12 participants (six JD and six CP coaches) were observed using teaching styles during three 30 minute coaching sessions.

Teaching Style	Percentage of time that teaching styles were observed from the 12 coaches' total sessions (36 sessions)
Command Style-A	**0.18%**
• ***Canopy design Command Style-A****	**10.40%**
Practice Style-B	**12.87%**
• ***Canopy design Practice Style-B****	**71.38%**
Reciprocal Style-C	**0%**
Self-Check Style-D	**0%**
Inclusion Style-E	**0%**
Guided Discovery Style-F	**0%**
Convergent Discovery Style-G	**0%**
Divergent Discovery Style-H	**0%**
Learner Designated Individual Program Style-I	**0%**
Learner Initiated Program Style-J	**0%**
Self-Teaching Style-K	**0%**
Class Management*	**5.15%**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.

Class Management is not considered a landmark teaching style or a canopy design.

As a percentage of total time observed, the results from the 12 coaches indicated that they employed landmark teaching style Practice Style-B for 12.87% of the time and landmark teaching style Command Style-A for 0.18% of the time. The 12 coaches were also observed performing two canopy designs. ***Canopy design Practice Style-B*** was observed for 71.38% of the time and a variation of landmark teaching style Command Style-A (***canopy design Command Style-A***) was observed for 10.40% of the time. After discussions with Prof. Sara Ashworth and careful observation and coding of the coaching sessions, no other landmark teaching styles or variations that approximated the landmark teaching styles (canopy designs) were observed among the 12 participants. As mentioned previously, it is conceivable that observing only three 30 minute coaching sessions, content of the sessions, age and ability of the players, number of players in the group and observer interpretation may have influenced these results. This aspect was not pursued as part of the study. *Class Management* activities were observed for 5.15% of the time. These activities consisted of the coach arranging equipment on the tennis court between activities.

For instance, placing *markers* to indicate where players will position themselves during activities.

In order to compare the observed teaching styles of JD and CP coaches, a depiction of the breakdown of total time (%) that the six JD and six CP coaches were observed implementing various teaching styles during their three 30 minute coaching sessions is shown in **Table 4.8**. This table also includes the breakdown of total time (%) percentage of all coaches (n=12) who were observed for comparison.

Table 4.8: The breakdown of total time (%) that the six JD and six CP participants were observed using teaching styles in addition to the breakdown of total time (%) of all coaches who were observed (n=12).

Teaching Style	Percentage of time that teaching styles were observed from the six JD coaches' three 30 minute coaching sessions (18 sessions)	Percentage of time that teaching styles were observed from the six CP coaches' three 30 minute coaching sessions (18 sessions)	Percentage of time that teaching styles were observed from the 12 coaches' (six JD and six CP coaches) three 30 minute coaching sessions (36 sessions)
Command Style-A	**0.37%**	**0.15%**	**0.18%**
• ***Canopy design Command Style-A****	**10.37%**	**9.98%**	**10.40%**
Practice Style-B	**13.48%**	**13.23%**	**12.87%**
• ***Canopy design Practice Style-B****	**70.25%**	**70.23%**	**71.38%**
Reciprocal Style-C	**0%**	**0%**	**0%**
Self-Check Style-D	**0%**	**0%**	**0%**
Inclusion Style-E	**0%**	**0%**	**0%**
Guided Discovery Style-F	**0%**	**0%**	**0%**
Convergent Discovery Style-G	**0%**	**0%**	**0%**
Divergent Discovery Style-H	**0%**	**0%**	**0%**
Learner Designated Individual Program Style-I	**0%**	**0%**	**0%**
Learner Initiated Program Style-J	**0%**	**0%**	**0%**
Self-Teaching Style-K	**0%**	**0%**	**0%**
Class Management*	**5.53%**	**6.41%**	**5.15%**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.

Class Management is not considered a landmark teaching style or a canopy design.

The results outlined in **Table 4.8** show remarkable similarities among all groups of coaches with reference to the amount of time that teaching styles were observed during the three 30 minute coaching sessions. These results may validate the accuracy of the coding instrument as well as the coders employed in this study. The six CP coaches were observed performing landmark teaching style Command Style-A for 0.15% of the time, while the six JD coaches used this landmark teaching style for 0.37% of the time. These two groups of coaches were also observed employing behaviour that approximated the decision structure of landmark teaching style Command Style-A. The coaches employed ***canopy design Command Style-A*** for similar amounts of time during their three 30 minute coaching sessions (JD=10.37% of the time, CP= 9.98% of the time). With regard to the observed usage of landmark teaching style Practice Style-B, the six CP coaches used this teaching style for 13.23% of the time, while the six JD coaches performed this teaching style for 13.48% of the time. In addition to employing landmark teaching style Practice Style-B, the JD and CP coaches were also observed employing a variation of this landmark teaching style for a comparable amount of time. The JD and CP coaches employed this variation for 70.25% and 70.23% of the time respectively.

4.2.2 Observed teaching styles of the single coach

In order to observe the use of teaching styles over an extended period of time, one coach from the original group of 13 coaches was chosen to participate in the extended observation period of 18 hours over a six-day period. These observations were conducted at the participant's place of work (local tennis club). The supplementary observational episodes permitted the researcher to collect additional data over a prolonged period of time and to compare these findings with the 12 coaches who participated in the shorter observational period of the study. This would serve as a case study to determine how indicative the use of teaching styles by the group of 12 coaches was when compared to the single coach observed over a longer period of time.

The characteristics of this coach were**:**

- Male JD coach from VIC (0-3 years coaching, 20-29 years old, mostly coaches 6-8 age group, mostly coaches beginner players).

The results from the single coach's observed use of teaching styles during the extended observation period of 18 hours are presented in the following section of this study. **Table 4.9** shows the breakdown of the range of teaching styles observed during the single coach's 18 hours of coaching.

Table 4.9: Breakdown of the range of teaching styles observed being employed during the single coach's 18 hours of coaching.

Participant	Teaching styles that were observed during the single coach's 18 hours of coaching
Single coach	**Landmark teaching style Command Style-A** **Landmark teaching style Practice Style- B** • ***Canopy design Command Style-A**** • ***Canopy design Practice Style-B****

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.

The single coach was observed implementing two landmark teaching styles. These were landmark teaching style Command Style-A and landmark teaching style Practice Style-B. The coach was also observed employing coaching behaviour that approximated the decision structure of two landmark teaching styles. These consisted of a variation of landmark teaching style Practice Style-B (***canopy design Practice Style-B***) and a variation of landmark teaching style Command Style-A (***canopy design Command Style-A***). These variations approximate the behaviour of the nearest landmark teaching style. A depiction of the breakdown of total time (%) that the single coach employed these teaching styles during the 18 hours of coaching is displayed in **Table 4.10.**

Table 4.10: The breakdown of total time (%) that the single coach was observed using teaching styles over 18 hours of coaching.

Teaching styles	Percentage of time that teaching styles were observed from the single coach's 18 hours of coaching
Command Style-A	**1.61%**
• ***Canopy design Command Style-A****	**9.44%**
Practice Style-B	**13.42%**
• ***Canopy design Practice Style-B****	**72.05%**
Reciprocal Style-C	**0%**
Self-Check Style-D	**0%**
Inclusion Style-E	**0%**
Guided Discovery Style-F	**0%**
Convergent Discovery Style-G	**0%**
Divergent Discovery Style-H	**0%**
Learner Designated Individual Program Style-I	**0%**
Learner Initiated Program Style-J	**0%**
Self-Teaching Style-K	**0%**
Class Management	**3.48%**

****Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.***

*****Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.***

*****Class Management is not considered a landmark teaching style or a canopy design.***

From the 18 hours of coaching that were observed, two landmark teaching styles were observed, in addition to two canopy designs that approximated the behaviour associated with the two landmark teaching styles. Landmark teaching style Command Style-A was employed for 1.61% of the time, while a variation of this landmark style (***canopy design Command Style-A***) was observed for 9.44% of the time. Landmark teaching style Practice Style-B was also observed for 13.42% of the time as well as a variation of this landmark style (***canopy design Practice Style-B***) which was observed for 72.05% of the time. No other landmark teaching styles or behaviour that approximated the landmark styles were observed. *Class Management* activities were observed for 3.48% of the time. The *Class Management* activities that were observed during the extended observations consisted of organising equipment in preparation for activities conducted during the sessions.

Table 4.11 parallels the breakdown of total time (%) the single coach was observed using teaching styles with the observations of the six JD coaches and six CP participants as well as the breakdown of total time (%) of all the coaches that were observed (n=12). As mentioned previously, the single coach was a JD coach.

Table 4.11: Breakdown of total time (%) that the single coach was observed using teaching styles in addition to the six JD coaches , six CP coaches and all the coaches who were observed.

Teaching Style	Percentage of time that teaching styles were observed from the single coach's 18 hours of coaching	Percentage of time that teaching styles were observed from the six JD coaches' three 30 minute coaching sessions (18 sessions)	Percentage of time that teaching styles were observed from the six CP coaches' three 30 minute coaching sessions (18 sessions)	Percentage of time that teaching styles were observed from the 12 coaches' (six JD and six CP coaches) three 30 minute coaching sessions (36 sessions)
Command Style-A	**1.61%**	**0.37%**	**0.15%**	**0.18%**
• ***Canopy design Command Style-A****	**9.44%**	**10.37%**	**9.98%**	**10.40%**
Practice Style-B	**13.42%**	**13.48%**	**13.23%**	**12.87%**
• ***Canopy design Practice Style-B****	**72.05%**	**70.25%**	**70.23%**	**71.38%**
Reciprocal Style-C	**0%**	**0%**	**0%**	**0%**
Self-Check Style-D	**0%**	**0%**	**0%**	**0%**
Inclusion Style-E	**0%**	**0%**	**0%**	**0%**
Guided Discovery Style-F	**0%**	**0%**	**0%**	**0%**
Convergent Discovery Style-G	**0%**	**0%**	**0%**	**0%**
Divergent Discovery Style-H	**0%**	**0%**	**0%**	**0%**
Learner Designated Individual Program Style-I	**0%**	**0%**	**0%**	**0%**
Learner Initiated Program Style-J	**0%**	**0%**	**0%**	**0%**
Self-Teaching Style-K	**0%**	**0%**	**0%**	**0%**
Class Management*	**3.48%**	**5.53%**	**6.41%**	**5.15%**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.
Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.
Class Management is not considered a landmark teaching style or a canopy design.

Similar findings are evident when the results of all the observations are compared in **Table 4.11**. Landmark teaching style Practice Style-B was observed for approximately 12.5% of time, while a variation that approximated the behaviour of this landmark teaching style was employed in the region of 70% of the time among all groups during coaching sessions. Behaviour that approximated the decision structure of landmark teaching style Command Style-A was also observed for similar amounts of time across all the groups (10% of the time). A slender percentage difference (3%) is evident between the percentages of time the single coach was observed performing *Class Management* activities with the time the six CP coaches were observed implementing similar tasks.

Table 4.12 demonstrates the comparison breakdown of total time (%) the single coach was observed using teaching styles over the extended observation period of 18 hours with this coach's three 30 minute coaching sessions. The teaching styles that were observed did not significantly differ. Landmark teaching style Command Style-A was employed for less than 2% of the time during the coach's 18 hours of coaching and the three 30 minute coaching sessions. The canopy design variation of this landmark teaching style (***canopy design Command Style-A***) was also employed for similar periods both times (approximately 10% of the time). The coach also implemented a variation that approximated landmark teaching style Practice Style-B for approximately 72% of the time during both observational periods (***canopy design Practice Style-B***). The greatest difference was seen in the coach's usage of *Class Management* activities. During the 18 hours of coaching, the employment of *Class Management* activities was observed for 3.48% of the time compared with 5.15% of the time during the coach's three 30 minute coaching sessions.

Table 4.12: Breakdown of total time (%) that the single coach was observed using teaching styles over an extended period of time (18 hours) in addition to this coach's three 30 minute coaching sessions.

Teaching Style	Percentage of time that teaching styles were observed from the single coach's 18 hours of coaching	Percentage of time that teaching styles were observed from the single coach's three 30 minute coaching sessions
Command Style-A	**1.61%**	**0.16%**
• ***Canopy design Command Style-A****	**9.44%**	**10.42%**
Practice Style-B	**13.42%**	**12.83%**
• ***Canopy design Practice Style-B****	**72.05%**	**71.44%**
Reciprocal Style-C	**0%**	**0%**
Self-Check Style-D	**0%**	**0%**
Inclusion Style-E	**0%**	**0%**
Guided Discovery Style-F	**0%**	**0%**
Convergent Discovery Style-G	**0%**	**0%**
Divergent Discovery Style-H	**0%**	**0%**
Learner Designated Individual Program Style-I	**0%**	**0%**
Learner Initiated Program Style-J	**0%**	**0%**
Self-Teaching Style-K	**0%**	**0%**
Class Management*	**3.48%**	**5.15%**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.

Class Management is not considered a landmark teaching style or a canopy design.

4.2.3 A comparison of the coaches' self-identified and observed teaching styles

A central aspect of this study was to explore the level of congruence between the teaching styles that the coaches self-identified and the teaching styles that were actually observed. Combining a survey questionnaire with observations permitted the researcher to verify with accuracy what the coaches in this study believe they do with what they actually do. According to Ashworth:

> There are too many studies that are meaningless and that have no real application to understanding theory or application. Unfortunately, I and many of my colleagues have had a lot of experiences working with surveys and interviews in the past. What we discovered was that there is a large gap between what people think and say they do and what they actually do; what they say they believe in and what their actions demonstrate they believe in. Therefore, if you want a study that offers meaningful information you will need to VERIFY the accuracy of what coaches think and say they do. Otherwise, you will have a study that collects numbers … without meaning. (S. Ashworth, personal communication, March 5, 2010)

In order to compare the findings from the survey questionnaire with the observation results, approval was requested from all the coaches that participated in the observational component of this study. All the coaches involved in the observations agreed to permit the researcher to use the survey questionnaire and observation data to compare findings.

The comparison between the percentage of time that teaching styles were observed from the JD coaches (n=6) and CP coaches (n=6) three 30 minute coaching sessions (36 lessons) and the self-identified teaching styles of the JD coaches (n=6) and CP coaches (n=6) is shown in **Table 4.13**. Differences are evident between the self-identified and observed teaching styles among the 12 coaches. In addition to the 12 coaches implementing landmark teaching style Command Style-A (0.18% of the time) and landmark teaching style Practice Style-B (12.87% of the time), teaching behaviour that approximated the decision structures of these landmark styles were also observed. A variation of landmark teaching style Command Style-A was observed for 10.40% of the time (***canopy design Command Style-A***), while a variation of landmark teaching style Practice Style-B was observed for 71.38% of the time (***canopy design Practice Style-B***). These figures are contrasted with the self-identified usage of landmark teaching style Command Style-A (50%) and landmark teaching style Practice Style-B (66.6%). Despite the coaches indicating that they used seven other landmark teaching styles including: Reciprocal Style-C (25%), Self-Check Style-D (25%), Inclusion Style-E (33.3%), Guided Discovery Style-F (66.7%), Convergent Style-G (33.3%), Divergent Discovery Style-H (50%) and Learner Designated Individual Program Style-I (8.3%), no other landmark teaching styles were observed among the 12 coaches. The findings, however, illustrate compatibility between what the coaches self-identified and what was observed between Learner Initiated Program Style-J and Self-Teaching Style-K. In this case, a percentage score of zero was recorded.

Table 4.13: A comparison between the percentage of time that teaching styles were observed from the 12 coaches (six JD and six CP coaches) three 30 minute coaching sessions (36 sessions) and the self-identified teaching styles of the 12 coaches (six JD and six CP coaches).

Teaching Style	Percentage of time that teaching styles were observed from the 12 coaches' (six JD and six CP coaches) three 30 minute coaching sessions (36 sessions)	Percentage of 12 coaches (six JD and six CP coaches) who self-identified using the teaching styles: *often* to *most of the time*
Command Style-A	**0.18%**	**50%**
• ***Canopy design Command Style-A****	**10.40%**	**NA**
Practice Style-B	**12.87%**	**66.6%**
• ***Canopy design Practice Style-B****	**71.38%**	**NA**
Reciprocal Style-C	**0%**	**25%**
Self-Check Style-D	**0%**	**25%**
Inclusion Style-E	**0%**	**33.3%**
Guided Discovery Style-F	**0%**	**66.7%**
Convergent Discovery-G	**0%**	**33.3%**
Divergent Discovery Style-H	**0%**	**50%**
Learner Designated Individual Program Style-I	**0%**	**8.3%**
Learner Initiated Program Style-J	**0%**	**0%**
Self-Teaching Style-K	**0%**	**0%**
Class Management*	**5.15%**	**NA**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.

Class Management is not considered a landmark teaching style or a canopy design.

Similar results were found in a comparison between the self-identified landmark teaching styles of the CP coaches as a single group (n=6) and the percentage of time that teaching styles were observed during their three 30 minute lessons. These findings are shown in **Table 4.1.**

Table 4.14: A comparison of the self-identified teaching styles of the six CP coaches as a single group and the percentage of time that teaching styles were observed during their three 30 minute coaching sessions.

Teaching Style	Percentage of time that teaching styles were observed from the six CP coaches' three 30 minute coaching sessions (18 sessions)	Percentage of six CP coaches' self-identified use of teaching styles: *often* to *most of the time*
Command Style-A	**0.15%**	**50%**
• ***Canopy design Command Style-A****	**9.98%**	**NA**
Practice Style-B	**13.23%**	**33%**
• ***Canopy design Practice Style-B****	**70.23%**	**NA**
Reciprocal Style-C	**0%**	**33.3%**
Self-Check Style-D	**0%**	**16.7%**
Inclusion Style-E	**0%**	**16.7%**
Guided Discovery Style-F	**0%**	**50%**
Convergent Discovery Style-G	**0%**	**33.3%**
Divergent Discovery Style-H	**0%**	**33.3%**
Learner Designated Individual Program Style-I	**0%**	**0%**
Learner Initiated Program Style-J	**0%**	**0%**
Self-Teaching Style-K	**0%**	**0%**
Class Management*	**5.15%**	**NA**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B.

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A.

Class Management is not considered a landmark teaching style or a canopy design.

The results in **Table 4.14** share similarities with the self-identified teaching styles of the JD coaches (n=6) as a single group and the percentage of time that teaching styles were observed during their three 30 minute sessions shown in **Table 4.15**. Similar to the CP coaches (n=6), the JD coaches were observed implementing two landmark teaching styles from the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008). Landmark teaching style Command Style-A was observed for 0.37% of the time, while for 13.48% of the time, the JD coaches' implemented landmark teaching style Practice Style-B. The JD coaches also employed a variation that approximated landmark teaching style Command Style-A for 10.37% of the time, in addition to a variation of landmark teaching style Practice Style-B for 70.25% of the time. The three additional landmark teaching styles located in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) that the JD coaches self-identified using included: Guided Discovery Style-F (50%), Convergent Discovery Style-G (33.3%) and Divergent Discovery Style-H (33.3%).

Table 4.15: A comparison of the self-identified teaching styles of the six JD coaches as a single group and the percentage of time that teaching styles were observed from the six JD coaches three 30 minute coaching sessions.

Teaching Style	Percentage of time that teaching styles were observed from the six JD coaches' three 30 minute coaching sessions (18 sessions)	Percentage of six JD coaches' who self-identified using the teaching styles: *often* to *most of the time*
Command Style-A	**0.37%**	**50%**
• ***Canopy design Command Style-A****	**10.37%**	**NA**
Practice Style-B	**13.48%**	**100%**
• ***Canopy design Practice Style-B****	**70.25%**	**NA**
Reciprocal Style-C	**0%**	**16.7%**
Self-Check Style-D	**0%**	**33.3%**
Inclusion Style-E	**0%**	**50%**
Guided Discovery Style-F	**0%**	**83.3%**
Convergent Discovery Style-G	**0%**	**33.3%**
Divergent Discovery Style-H	**0%**	**66.7%**
Learner Designated Individual Program Style-I	**0%**	**16.7%**
Learner Initiated Program Style-J	**0%**	**0%**
Self-Teaching Style-K	**0%**	**0%**
Class Management*	**5.53%**	**NA**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A

Class Management is not considered a landmark teaching style or a canopy design.

The findings of the single coach's self-identified use of teaching styles and the observed employment of teaching styles over an extended period (18 hours) resemble those from **Table 4.13, 4.14** and **4.15**. **Table 4.16** illustrates the comparison of the self-identified teaching styles of the single coach and the percentage of time that teaching styles were observed from this coach's 18 hours of coaching. To some extent, this coach self-identified the use of all but two of the 11 landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008). The 18 hours of observations indicated the employment of two landmark teaching styles in addition to the implementation of behaviour that approximated these landmark styles. The coach self-identified the use of landmark teaching style Command Style-A for 55% of the time during coaching sessions throughout the year. This is contrasted with the observed use of landmark teaching style Command Style-A for 1.61% of the time, in addition to behaviour that approximated this landmark style (9.44% of the time). Similarly, the coach self-identified the employment of landmark teaching style

Practice Style-B during coaching sessions throughout the year for 90% of the time, yet, the observations revealed that this landmark style was actually used for 13.42% of the time. The observations also indicated, however, that the coach used a variation that approximated the behaviour of landmark teaching style Practice Style-B for 72.05% of the time during sessions. No other landmark teaching styles or coaching behaviour that approximated these landmark styles were observed over the duration of the 18 hours.

Possible explanations for this discrepancy may be due to the duration of the coaching sessions (coaching sessions for this coach were 60 minutes in duration), content of the sessions, age and ability of the players and the number of players in the group. An additional reason may relate to the single coach's level of experience, knowledge and understanding of teaching styles as well as their awareness of coaching practices. Despite both coders having extensive practice with the coding tool, it is possible that inconsistencies were evident with the coding of the sessions. Despite initially experiencing an increased level of self-awareness during the observations, the coach indicated that this feeling was evident only during the first session of the observation period (60 minutes). Following this, the coach was mostly unaware of the camcorder or lapel microphone, and conducted the sessions in a customary way.

Table 4.16: A comparison of the self-identified teaching styles of the single coach and the percentage of time that teaching styles were observed from the single coach's 18 hours of coaching.

Teaching Style	Percentage of time that teaching styles were observed from the single coach's 18 hours of coaching	Percentage of the single coach who self-identified using the teaching styles: *often* to *most of the time*
Command Style-A	**1.61%**	**55%**
• ***Canopy design Command Style-A****	**9.44%**	**NA**
Practice Style-B	**13.42%**	**90%**
• ***Canopy design Practice Style-B****	**72.05%**	**NA**
Reciprocal Style-C	**0%**	**16.7%**
Self-Check Style-D	**0%**	**28.3%**
Inclusion Style-E	**0%**	**51%**
Guided Discovery Style-F	**0%**	**72.4%**
Convergent Discovery Style-G	**0%**	**32.3%**
Divergent Discovery Style-H	**0%**	**65.7%**
Learner Designated Individual Program Style-I	**0%**	**17.7%**
Learner Initiated Program Style-J	**0%**	**0%**
Self-Teaching Style-K	**0%**	**0%**
Class Management*	**3.48%**	**NA**

Canopy design Practice Style-B is a variation that approximates landmark teaching style Practice Style-B

Canopy design Command Style-A is a variation that approximates landmark teaching style Command Style-A

Class Management is not considered a landmark teaching style or a canopy design

4.2.4 Summary of the major findings

The results suggest that tennis coaches believe they employ a range of teaching styles during coaching sessions throughout the year. Yet after observing the 12 coaches during three 30 minute sessions in addition to the single coach during 18 hours, a total of two landmark teaching styles were observed. Variations that approximated the decision structure of landmark teaching style Command Style-A and landmark teaching style Practice Style-B were also evident during all the coaches' observed sessions. Notwithstanding the teaching styles that the coaches self-reported using, these constituted the only observed teaching styles of the coaches. The results clearly indicated a significant discrepancy between the coaches' action and intent.

The video-recorded sessions of the 12 coaches during three 30 minute observations revealed two teaching styles from the *reproduction cluster*. As a percentage of total time observed, landmark teaching style Command Style-A was

observed for 0.18% of the time, and landmark teaching style Practice Style-B was observed for 12.87% of the time. A variation of landmark teaching style Command Style-A was also observed for 10.40% of the time, in addition to behaviour that approximated landmark teaching style Practice Style-B (71.38% of the time). No other landmark teaching styles or variations were observed.

From the extended observational period of 18 hours with the single coach, two landmark teaching styles were also observed in addition to variations (canopy designs) that approximated these landmark teaching styles. As a percentage of total time observed, landmark teaching style Command Style-A was employed for 1.61% of the time, and landmark teaching style Practice Style-B was observed for 13.42% of the time. Similar to the 12 coaches' observations, the single coach was also observed performing a variation of landmark teaching style Command Style-A for 9.44% of the time, as well as behaviour approximating landmark teaching style Practice Style-B for 72.05% of the time. No other landmark teaching styles or approximated behaviour of these landmark styles were coded.

4.3 Stage 3: Interviews

Stage 3 of the research was designed to further expand on the results reported from **Stage 1** (survey questionnaire) and **Stage 2** (observations) of the study. **Stage 3** consisted of implementing interviews with the 13 coaches who participated in **Stage 2** (observations) of the study. This included the 12 coaches who were observed during three 30 minute sessions in addition to the single coach who was observed for an extended period of time (18 hours). In reporting the results for the interviews, the researcher will refer to all the coaches (n=13) who participated in **Stage 2** and **Stage 3** of the research as a collective group. This is opposed to distinguishing between the 12 coaches who were chosen to participate in three 30 minute observation sessions and the single coach who was selected for the extended observational period of 18 hours. Due to the same interview schedule (i.e., interview questions, duration of interview) in addition to similar conclusions emanating from the participants' responses, the researcher referred to all the coaches (n=13) when reporting the results.

Although originally planned to take 30-60 minutes, the interviews (which were scheduled to suit the participants' work and leisure commitments), lasted between 80 and 100 minutes in length. Prior to the interviews, each of the 13 coaches was requested to view a portion of their video-recorded sessions. The 12 coaches who were observed during three 30 minute observations were requested to watch all three of their video-recorded sessions. The single coach who participated in the extended observation period was encouraged to view a minimum of three 30 minute sessions from the 18 hours of video-recorded footage. The 12 coaches who were observed viewed the same number of observations for consistency. The researcher deemed it unreasonable to request that the single coach observe all the video-recorded sessions (18 hours). These video-recorded sessions were transferred on to a disc and provided to the coaches by the researcher prior to the interview. At the commencement of the interview, the researcher asked the respondents to comment on their coaching sessions about the *way* they coached. When posing questions about

the coaching habits of the participants, the researcher used the term *way* during the interviews rather than more specific terms (e.g., methods, approaches, styles). Referring to specific terms may have influenced the participants' responses when identifying and interpreting their coaching practices. In order to protect each interviewee's anonymity, an assumed name was assigned. The researcher selected a pseudonym for each interviewee.[4] Only the researcher was privy to the participants' actual names and corresponding pseudonyms.

In the following section, a description of the coaches' teaching styles during their coaching sessions are described and elaborated through the coaches' direct reference to particular teaching styles and the insights they have about these teaching styles during coaching sessions. In terms of structure, the following section will provide a description of the coaches' prevailing beliefs from the six interview questions posed to all 13 coaches during the interviews. After this, a summary of the findings will be presented to provide a response to the research question:

3. What are the coaches' insights of the teaching styles they employ during coaching sessions?

The six questions posed during **Stage 3** (interviews) of the study were designed to provide an answer to this research question. One of the aims of this study was to explore the coaches' insights in relation to teaching styles they employ as well as the motivations and reasons that underpin these practices. These findings served to illuminate and validate the meaning of the results from **Stage 1** (survey questionnaire) and **Stage 2** (observations) of the study.

4.3.1 Interview question 1: "Could you identify or tell me what has or have been the major influences on the *way* you currently coach?"

This question was specifically designed to provide the researcher with some background information with regard to *how* and *where* the coaches learned the particular *ways* they coach. Of the 13 participants that were interviewed, 11 coaches indicated that their experiences as a tennis student and the *way* they were coached significantly influenced the *way* they coach now. As Tegan explained:

> My coach had a big influence on the way I coach now. I still learn from him now and just kind of automatically do what he does, the same activities and how to explain things. I can still remember how he coached me as a beginner, like the exact activities. I just try and use these activities because they were fun for me. (Tegan, JD coach interviewee, July 11, 2011)

Patrick outlined a similar experience:

> My coach had a huge influence. I learned for so long that I found that I just used the same methods and tennis games to coach my kids now. I enjoyed the way she coached me so I use these similar methods. (Patrick, JD coach interviewee, July 14, 2011)

[4] A pseudonym is a name that a person or group assumes for a particular purpose, which differs from his or her true name.

Bill and Chris, however, expressed a different point of view in regards to the *way* they were taught. Bill, a CP participant, and Chris, a JD participant, both claim that their experiences as tennis students had little influence on how they currently coach. Bill commented:

> My coach was old school in terms of his coaching methods. I look around today and coaching is different. Less standing in lines, this is how I was taught. You didn't often play the game, just hit, run around and pick up balls and stand back in line. Maybe you played a tournament at the end of the term. I try and coach differently, play more games, more hits for the kids. (Bill, CP coach interviewee, July 12, 2011)

All 13 coaches acknowledged the significant influence of a mentor on the *way* they currently coach. Each of the participants who were interviewed identified the Head Coach at the tennis club that they work as this mentor. Stephanie indicated that her mentor was the "primary influence on how I currently coach in my lessons" (Stephanie, JD coach interviewee, July 11, 2011). Similarly, David attributed his coaching behaviour to the Head Coach (also his employer) at the tennis club where he coaches. David remarked "the Head Coach at my club has definitely given me a lot of guidance. He writes the programs for us to use. These activities are good and fun for the kids" (David, CP coach interviewee, July 15, 2011).

4.3.2 Interview question 2: "After watching your three observed coaching sessions what are your thoughts with regard to the *way* you coached?"

Prior to conducting the interviews, each coach was requested to view three of their video-recorded coaching sessions. At the commencement of the interview, the researcher asked the respondents to comment on these coaching sessions with regard to the *way* they coached. All the coaches expressed a high degree of surprise and disbelief as to what transpired during these sessions. Each coach indicated and acknowledged an apparent lack of compatibility with regard to what they believed happened during the sessions and what actually ensued concerning the *way* they coached. All the coaches strongly believed that they had coached in a particular *way* that emphasised the following areas:

- Asking the players to respond to questions about technical and tactical skills and challenges.
- Permitting the players to primarily engage in game-play and rallying.
- Allowing the students to solve technical and tactical skills and challenges independent of the coach and not directly and prescriptively informing the players what to do or how to do it.
- Limited ball *feeding*.

The video-recorded observations indicated that all coaches frequently employed *ways* of coaching that involved:

- Specifically and solely developing the technical skills of the players.
- Providing prescriptive information directly to the players to develop these skills.

- High frequency of ball *feeding* by the coach to enable players to develop their technical skills.

When asked to comment on what occurred during the three observations with regard to the *way* she coached, Tegan's response was common to all the interviewees:

> Well, I thought my coaching methods had more questions, yeah, the video really shows you different things doesn't it? I like to ask lots of questions in all my lessons I really thought that I asked a lot of questions and I tried to get the students to figure things out for themselves … I tried to ask questions and get them to discover for themselves … it was a bit of a disaster really. When I looked at the video, I did heaps of talking. The second lesson was the same, I thought that I questioned, but I was telling them what to do. I even started feeding balls, which wasn't even on my lesson plan! (Tegan, JD coach interviewee, July 1, 2011)

Similarly, Stephanie stated:

> It was a bit embarrassing (laughing), I wasn't doing half the stuff that I thought I was, it was like I was a different coach. I thought my lessons were all really Game-Based, but looking at the videos I did all this feeding of balls, I thought I used questions and the guided discovery method, but having watched the DVD I actually didn't ask that many questions. I didn't realise that I did as much telling either. It was both difficult and interesting to watch. (Stephanie, JD coach interviewee, July 11, 2011)

David also provided similar sentiments when he asserted:

> I was basically very command style, after watching the videos, feeding balls and telling them what to do, I asked a few questions but much less that I thought and certainly less than I planned on my lesson plan. (David, CP coach interviewee, July 15, 2011)

All the coaches remarked on the beneficial outcomes associated with viewing their coaching sessions. The coaches expressed strong agreement that the video-recorded footage provided a useful platform to review their performance and assist in developing their understanding of the coaching process. For instance, Chris commented:

> I've never watched myself before, so it was really good to see what I do and how I coach, I thought that I might have used a more Game-Based Approach, but I did a lot of talking, I didn't shut up actually!, one of the comments from my learning facilitator was that I spent too much time explaining things and the kids didn't get to hit enough balls, at the time I didn't really agree with her, but after watching the lesson, I can see that I spent way too much time talking. (Chris, JD coach interviewee, July 12, 2011)

Jimmy also found the experience beneficial and mentioned:

> Well, it was good to see what I was actually doing and how the kids were responding to the activities, I also picked up quite a bit from what I was doing and how I could possibly do things better. (Jimmy, CP coach interviewee, July 21, 2011)

David suggested that the video-recording of sessions should feature more prominently in the accreditation courses at Tennis Australia (TA):

> Yeah, I managed to take a look at the videos on Wednesday night, it was quite good, good to look at yourself coach and see what is happening, actually happening on the court. It would be good to have a copy of the DVD when you speak with the learning facilitator, instead of them just telling you about the lesson and talking you through what happened, the video lets you see it for yourself. (David, CP coach interviewee, July 15, 2011)

4.3.3 Interview question 3: "Are there any additional *ways* of coaching tennis?"

The interviews revealed an assortment of terms that coaches used to describe the *way* they coached during their video-recorded coaching sessions. These terms are listed in **Table 4.17**. All the respondents in this study reported to using a Game-Based Approach (GBA) or Game-Based Method during their three observed coaching sessions. Most of the coaches (n=10) also nominated a discovery style, discovery method, modern way/method, and discovery approach as a *way* they coached in each of their sessions. Four of the respondents also claimed to have employed a constraints-based approach during the sessions.

Table 4.17: Outline of all the terms that the interviewed coaches (n=13) described as the *ways* that they coached during their three observed coaching session.

***Ways* of coaching tennis described by coaches**	**Number of coaches who described and coached this *way***
Game-Based Approach (GBA)	**13**
Game-based method	**13**
Discovery style	**10**
Discovery method	**10**
Discovery approach	**10**
Modern way/method	**10**
Games-centred strategy	**9**
Games strategy	**9**
Games approach	**9**
Constraints-based approach	**4**

During the course of the coaches' responses, the researcher also asked whether they were able to identify any additional *ways* of coaching. Alternative *ways* of coaching

tennis that were identified by 13 of the respondents included: a Technique-Centred Approach (TCA), traditional approach, direct style, and command approach. All eight coaches who identified these *ways* claimed not to have used them during their observed coaching sessions. An outline of these additional terms as well as the number of coaches who identified them is detailed in **Table 4.18**.

Table 4.18: Outline of additional terms that were described by the interviewed coaches (n=13) but not used during their observed coaching sessions.

Additional *ways* of coaching tennis as described by coaches	**Number of coaches who described these additional *ways* of coaching tennis**
Technique-Centred Approach (TCA)	**13**
Indirect approach	**11**
Traditional approach	**13**
Direct style	**11**
Command approach	**13**

The variety of terms that coaches used to describe the *ways* they coached during each of their observed coaching sessions was frequently employed interchangeably. Terms such as Games Based Approach (GBA), game-based method and playing games approach were often used to describe a similar *way* of coaching tennis. Other terms that all the interviewed coaches associated with a Games-Based Approach (GBA) included: discovery method, indirect style, modern way/method and discovery style and in two cases a constraints-based approach was identified. Travis describes this point:

> I mainly used a Game-Based Approach (GBA) or method during all of my lessons. It is a modern way of coaching these days. Discovery styles are the best way. Providing constraints to students increases the challenge (Is the use of constraints a specific practice?) Yeah … a constraints-based approach or really a Game-Based Approach (GBA) it is. (Travis, JD coach interviewee, July 8, 2011)

In describing the *way* that she coached during the observed sessions, Nicole commented:

> I always tried to use a discovery method during my lessons, or a Game-Based Approach (GBA). I think that my assessments were very game-based and discovery. Kids playing games and being active. The old traditional ways of coaching have really been replaced by this up-to-date modern method of coaching. It's about less telling and more about questions … the coach shouldn't be direct and tell … let the kids work it out with questions. (Nicole, CP coach interviewee, July 15, 2011)

4.3.4 Interview question 4: "Can you interpret and define the *ways* you coached during your three observed coaching lessons?"

The terms Game-Based Approach (GBA), game-based method, discovery method, playing games approach, discovery style, constraints-based approach, indirect approach and modern way/method were defined and interpreted in a similar manner among 11 of the coaches that employed these terms. Common interpretations and definitions among the coaches consisted of:

- Asking the players to respond to questions about technical and tactical skills and challenges.
- Permitting the players to primarily engage in game-play and rallying.
- Allowing the students to solve technical and tactical skills and challenges independent of the coach.
- Not directly and prescriptively informing the players *what* to do or *how* to do it.

Jimmy's response provides a specific example of this frequent occurrence:

> I mainly used a Game-Based Approach (GBA). In all the lessons I tried to get the students to figure out the answers for themselves … I asked questions and got them to discover for themselves. Using discovery methods or a Game-Based Approach (GBA) allows maximum participation. You shouldn't really tell the students, rather make them explore and find out on their own. (Jimmy, CP coach interviewee, July 21, 2011)

In the following response, it is clear to see that Andrea's definition and interpretation of the discovery method, The Game-Based Approach (GBA), indirect method and modern way/method are analogous:

> The discovery method is about asking heaps of questions and discovery, it's all about questioning … it is really the modern approach to coaching tennis nowadays, the old traditional way of telling and being direct instead of using an indirect Game-Based Approach (GBA) is old fashioned really. Coaches have to let the students find out the answers. The Game-Based Approach (GBA) is the same really, ask questions and let the kids explore and find out for themselves. I reckon that I used these most of the time … if not all the time. (Andrea, CP coach interviewee, July 17, 2011)

In another example, Jill provided a definition and interpretation of a Game-Based Approach (GBA), discovery approach, indirect method and modern way/method:

> My lesson plans for the assessments were very much game-based and indirect. This method just lets the kids play games really; it's about playing games, points and discovery. Being indirect and not telling the students what to do is the way to go … the discovery approach to my lessons are prominent

> … just let them play and figure out the solutions to the problems they face on the court. (Jill, CP coach interviewee, July 17, 2011)

With regard to implementing a constraints-based approach during her three observed coaching sessions, Stephanie commented:

> The Game-Based Approach (GBA) and constraints-based approach are basically the same … it's about playing games and rallying, getting the kids to explore the answers and trying not to give it to them. This indirect method is the best way, the only way really now to teach tennis. (Stephanie, JD coach interviewee, July 11, 2011)

David also provided a comparable definition and interpretation:

> The Game-Based Approach (GBA) and the constraints-based approach are both essentially modern, non-traditional coaching methods. They really are the same in that it's about games and rallies, and not telling the kids, it's about letting them discover answers to skills and activities. (David, CP coach interviewee, July 15, 2011)

All 13 coaches additionally commented on the specific role of the coach in these *ways* of coaching tennis. All the interviewees believed that when delivering a tennis session the coach should withdraw from hitting (feeding) tennis balls to players, and not directly and prescriptively informing students on how to perform various skills. In this case, the players should commence an activity by hitting (feeding) themselves. Furthermore, it was asserted by all 13 interviewed coaches that the primary role of the coach, in this *way* of coaching tennis, is to repeatedly pose questions to the learners who must make their own decisions and determine answers to technical and tactical problems. An example of this can be seen in Patrick's response:

> You let kids figure it out what to do. Let them decide what to do and how to do it. You try and ask lots of questions. The coach doesn't get involved in the lesson like feeding or anything like that. Just let the kids play and discover answers for themselves. (Patrick, JD coach interviewee, July 14, 2011)

Tim's interpretations share similarities with those of Patrick's:

> The coach should not tell the kids what to do, but ask lots of questions and just let them figure it out and make all or most of the decisions, explore the solutions and create the answers to the activities or technical problems they are having. This is a Game-Based Approach (GBA) essentially. This approach includes no feeding of balls … the coach shouldn't be feeding and hitting really, rather let them start the rallies and the activities, this is part of their decision making process I guess, it you want to call it that, the coach shouldn't be command or direct. (Tim, JD coach interviewee, July 30, 2011)

In the same way, Rebecca asserted:

> The students should ideally be left to solve the challenges and problems on their own … this is a game-based or discovery method. Not much feeding and a lot of rallying that the kids start up themselves … it's all about them discovering and finding out for themselves. The coach isn't there to feed balls, the kids should start the rallies for themselves, drop and hit, overarm serve, overarm throw, whatever their standard, but let them start the activities … it's quite old-fashioned for coaches to feed these days I think. Too many coaches talk too much and tell the students all the information, that's not good, I think, don't be so command. (Rebecca, JD coach interviewee, July 28, 2011)

Table 4.19 provides an outline of the terms that the interviewed coaches used interchangeably when asked to describe the *ways* of coaching they employed during their video-recorded sessions. It also delineates the common definitions and interpretations associated with these terms.

Table 4.19: Outline of the terms that the interviewed coaches (n=13) used interchangeably and common examples of these definitions and interpretations.

Coaching terms listed by coaches that were used interchangeably	Common examples of definitions and interpretations associated with the terms listed by coaches
• **Game-Based Approach (GBA)** • **Game-based method** • **Discovery method** • **Playing games approach** • **Discovery method** • **Discovery style** • **Constraints-based approach** • **Indirect approach**	• **"Asking questions"** • **"Pose lots of questions"** • **"Let kids play games"** • **"Let them make the decisions"** • **"Let them rally and explore the solutions"** • **"Allow the players to figure it out"** • **"Don't tell them how to do it"** • **"Let the players explore and figure out the answers on their own"** • **"Questioning and answering of challenges, rather than being direct and telling"**

4.3.5 Interview question 5: "Can you interpret and define any additional *ways* of coaching tennis?"

Terms such as technique-based approach, traditional approach, direct style, and command approach were largely used synonymously and comparably defined and interpreted by the coaches. The additional *ways* of coaching tennis were generally interpreted and defined by the coaches as:

- Developing the technical skills of the players.
- Providing prescriptive information directly to the players to develop these technical skills.
- Hitting tennis balls to players (feeding tennis balls) to players to enable them to develop their technical skills.

Rebecca's interpretation and definition of this *way* of coaching tennis shared similarities with Bill's definition and interpretation. She stated:

> There is a technique-based approach. This approach is basically about focusing on the technique and telling the students how to do the skill, it's quite a traditional way really, feeding balls and telling the kids what to do and how to do it. (Rebecca, JD coach interviewee, July 21, 2011)

Similarly, Bill remarked:

> Yeah, there are other ways of coaching, but they are more traditional really, perhaps outdated even … There is a direct method or a traditional method to coaching. The direct method is about getting the students to do what you want … telling them exactly it is you want them to achieve and do … like showing them exactly how to hit a forehand or a serve. This more often than not involves the coach feeding balls to the players. It's not that effective really, and probably not that encouraged. (Bill, CP coach interviewee, July 12, 2011)

David and Tegan's responses also shared common and complimentary definitions and interpretations. David commented:

> The traditional method of coaching is feeding balls to players to get their technique right. Lots of repetition and lots of direction and telling the children what it is they must do. It's really all about technique-based instructions … getting the technique right first. (David, CP coach interviewee, July 15, 2011)

Comparably, Tegan mentioned:

> The technique-based approach to coaching is quite old fashioned, but gets used a lot still I think. It's useful though, you get lots of repetition through feeding lots of balls to the players and the coach does a lot of talking and telling … instructing to the player. I don't really use it, and I tried not to do it in my lessons, they were more game-based method and less traditional ... coaches are required or should really be doing more modern things these days. (Tegan, JD coach interviewee, July 1, 2011)

Table 4.20 provides an outline of the terms that the coaches interviewed in this study (n=13) used interchangeably when asked to describe any additional *ways* of coaching tennis of which they were aware of. It also delineates the common definitions and interpretations associated with these terms.

Table 4.20: Outline of the additional terms that the interviewed coaches (n=13) used interchangeably and common examples of these definitions and interpretations.

Coaching terms listed by coaches that were used interchangeably	Common examples of definitions and interpretations associated with the terms listed by coaches
• **Technique-based approach** • **Traditional approach** • **Direct style** • **Command approach**	• **"Feed lots of balls"** • **"Feeding lots of balls to the players"** • **"The coach makes all the decisions"** • **"Getting the kids to do what you want exactly"** • **"Lots of repetition and lots of direction"** • **"The coach does a lot of talking and telling"** • **"Very traditional"** • **"Old fashioned"** • **"Perhaps outdated"** • **"Very direct"** • **"Quite a traditional way"**

4.3.6 Interview question 6: "Can you outline and discuss your reasons for adopting these *ways* that you coached during the three observation sessions?"

All the coaches indicated that the *ways* of coaching that encouraged players to engage in skill development via the following four areas were the most effective *ways* to coach. As previously outlined by the coaches, these four areas were:

- Asking the players to respond to questions about technical and tactical skills and challenges.
- Permitting the players to primarily engage in game-play and rallying.
- Allowing the players to solve technical and tactical skills and challenges independent of the coach and not directly and prescriptively informing the players what to do or how to do it.
- Limited ball *feeding*.

The *ways* of coaching that were synonymous with these areas as described by all 13 coaches who were interviewed included: Game-Based Approach (GBA), playing games method, game-based method, discovery method, indirect approach, discovery style and constraints-based approach. All of the participants further suggested that this *way* of coaching tennis provided a more robust learning environment and that learning under these conditions was more permanent. Tegan's response when asked

to outline and discuss the reasons for adopting the *ways* she coached during her three observed coaching sessions provided an accurate overview and indication of what the remaining 11 coaches thought about this question. Tegan remarked:

> The Game-Based Approach (GBA) produces better learners, better players. They work it out for themselves and remember better. Telling kids what to do doesn't really work, won't help them on the weekend when they are playing, they get to rely on the coach too much when its technique and or traditional. When kids work it out themselves and on their own they learn more and remember better. (Tegan, JD coach interviewee, July 1, 2011)

Travis and Bill shared remarkably similar opinions. Travis commented:

> The games method is the best way I think, the reasons are because the kids learn more in this way, questions and problem solving, it is just a better way for them, rather than directly telling them. (Travis, JD coach interviewee, July 8, 2011)

Expressing compatible views, David reflected: "It is (A Game-Based Approach) a more effective way, they learn better and faster, when they are involved in their own learning, they remember more" (David, CP coach interviewee, July 15, 2011). A large majority of the coaches (n=11) also believed that by employing this *way* of coaching, the players were more motivated and had more fun during coaching sessions. Nicole strongly believed: "it's the best way but really it's the most fun for the kids, they love it, lots of action and questions, they are in control, the coach isn't directly telling them what to do" (Nicole, CP coach interviewee, July 15, 2011). Similarly, Jill noted: "Game-Based Approach (GBA) is more fun for the kids, than direct ways of coaching … they learn better and more in this way of coaching" (Jill, CP coach interviewee, July 17, 2011).

Table 4.21 outlines the coaches' responses in connection with the main reasons why they chose to adopt a particular *way* of coaching during their observed coaching sessions.

Table 4.21: A summary of the interviewed coaches' (n=13) responses with regard to the main reasons why they chose to adopt a particular *way* of coaching during their observed coaching sessions.

Coaches' responses on why they chose to adopt a particular *way* of coaching
• **"It's more fun"** • **"The kids have more fun this way"** • **"They learn better, and become better at creating their own responses and decisions during points and activities"** • **"They learn better and more in this way"** • **"It's heaps more fun"** • **"It's the best way, and the most fun approach"** • **"The Game-Based Approach (GBA) produces better learners, it's a lot more fun to start with"** • **"The kids learn more using this approach, its way more interesting and fun for them"** • **"Kids are able to make better decisions and as a result they can decide what to do during rallies"** • **"The games method is more beneficial than more direct methods, like telling, it's too boring for them, The Game-Based Approach (GBA) is much more exciting and fun"** • **"The players make the decisions, so they become really, better at making decisions and deciding what to do during points on the court"**

All the coaches commented that the choice and employment of a particular *way* of coaching did not alter as a function of the age or ability of the players they coached. Each of the coaches specified that they used the same *way* of coaching in all of their coaching sessions, regardless of the age level or ability of their students. Furthermore, nearly all the coaches stated they did not believe that they should be required to change the *way* they coach. This was apparent in the following responses by some of the interviewees that are representative of all the coaches' insights that were interviewed (n=13):

> I pretty much instruct the same way with everyone, or at least I try and do it this way … it's my style to let kids and adults for that matter discover the skills of what to do on their own, I don't really think I need to change my particular style … it should work across all standards and groups … ages. (Patrick, JD coach interviewee, July 14, 2011)

> Yeah … I just modify my use of language and stuff … so the little ones can understand what I'm saying … my instructions … sometimes with the older ones and better ones, but really I coach the same way, use the same approach,

> A Games-Based Approach … still a lot of questions, and try and get the kids thinking on their own. (Chris, JD coach interviewee, July 12, 2011)

> My philosophy is games-method with all my students really, I don't think that it really matters what age or level they are. All types and ages of players can learn with this method … I also don't think that it's really necessary to change a method based on who the kids are … or who the adults or older students you have. (Bill, CP coach interviewee, July 12, 2011)

> I don't think coaches' should have to change their style. The Game-Based Approach (GBA) is just a better way to coach, so it can be done with all players, it doesn't really matter what the age of the player is, or the level really, you might have to ask easier questions to the younger kids, but, that's about it. All kinds of players find this a more fun way to learn. (Andrea, CP coach interviewee, July 17, 2011)

4.3.7 Summary of the major findings

Research that has the capacity to identify the underlying explanations of coaching practices presents a pathway for coaches to contest and reflect on the effectiveness of their practices. This permits a more coherent connection between beliefs and practice. While survey questionnaires and observation can provide descriptive data of coaching practice, it cannot "provide an insight into why coaches do what they do" (Potrac et al., 2000, p. 19). As indicated earlier, not everything is observable – for instance, feelings, thoughts and intentions (Patton, 2002). Research that addresses the individual interpretations of coaches' experiences via interview techniques presents the prospect of engendering theory that is an accurate and authentic representation of the complex realities of sports coaching (Cote et al., 1995b; Potrac et al., 2002). Implementing interviews in this study provided assistance to identify *how* the coach facilitates learning during coaching sessions and *why* coaches decide upon the application of teaching styles during coaching sessions. With a greater understanding and awareness of coaching behaviours, theorising with regards to current limitations becomes possible (Abraham & Collins, 1998). **Table 4.22** provides a summary of the major findings from the interview component of this study.

Table 4.22: A summary of the major findings from the interviewed coaches (n=13).

A summary of the major findings from the interviews of the 13 coaches
• **An overwhelming majority of the coaches (n=11) that were interviewed nominated a mentor in addition to their experiences as a tennis student and the *way* they were taught as having the greatest influence on the *way* they currently coach**
• **The interviews revealed an assortment of terms that coaches used to identify the *way* they coach**
• **The terms the coaches employed to describe the *way* they coached were frequently used interchangeably**
• **All the coaches claimed to have primarily implemented a Game-Based Approach(GBA) during all of their observed coaching sessions**
• **Common definitions and interpretations among the interviewed coaches of a Game- Based Approach (GBA) consisted of 'asking questions of students', 'letting the students play games' and 'allowing the students to solve answers to movement challenges' and 'not feeding balls the players'**
• **'Having fun' and the 'best way to learn' were commonly submitted as reasons for employing particular *ways* of coaching during sessions**
• **The results of the interviews suggested that the coaches lacked an ability to accurately describe the *ways* they coached during their observed coaching sessions and therefore lacked self-awareness of their coaching behaviours**
• **The interviews established that despite the coaches' limited awareness of the *ways* they coach during coaching sessions, they did display an ability to articulate the type of learning environment they wished to produce and behaviours they wanted to encourage**
• **The coaches possessed limited knowledge, however, of the reasons why these behaviours might be of benefit**
• **The coaches' decision to employ certain *ways* of coaching did not alter as a function of the age group, skill level or ability of the players they were coaching**
• **There were no significant differences between the responses of the coaches completing the Junior Development coaching course and the coaches completing the Club Professional coaching course**

Overall, the results from **Stage 3** (interviews) of the study highlighted a lack of knowledge concerning the theoretical and practical application of various teaching styles required for coaching tennis to junior players. It was also evident that the 13 coaches lacked self-awareness with regard to their own coaching performance and were incapable of accurately describing the reasons why they implement particular *ways* of coaching. The interviews also revealed that coaches used an assortment of terms to identify the *way* they coach and that their decision to employ certain *ways* of coaching did not alter as a function of the age group, skill level or ability of the players they were coaching.

This chapter has presented the findings from the research. In light of these findings, the following chapter will submit responses to the research questions in addition to providing a discussion based on these findings.

CHAPTER FIVE: DISCUSSION

In this chapter a discussion of the results from each stage of the study is presented. In terms of structure, this commences with a discussion of the results from **Stage 1** (survey questionnaire), followed by **Stage 2** (observations) and finally **Stage 3** (interviews). A response to each of the research questions is also provided as part of the discussion. This chapter aims to locate the findings of the current study within the landscape of the relevant body of literature. Specifically, *What do the findings of the study support or contradict in the literature?* and *What do the findings of the study add to current scholarship?* Furthermore, *What new questions have emerged owing to the findings of the study?* and, *How has the current study extended the theory of Mosston and Ashworth's Spectrum of Teaching Styles*?

Literature in the field of skill acquisition has revealed significant progress in expanding our awareness of motor skill learning and the kinds of teaching styles that most effectively develop performance players (Davids, 2010; Davids et al., 2008; Farrow et al., 2008; Chow et al., 2007; Williams & Hodges, 2004, 2005). In spite of this information, it is advocated that the behaviour of coaches primarily act as an avenue to link player understanding to the content presented in the session (Hall & Smith, 2006). In view of that, it is regarded as crucial that coaches "consider the objectives of the session, so that he or she can determine whether given behaviours are relevant to the task (Lyle & Cushion, 2010, p. 52). The effective coach has the ability to customise the content of the session and adapt the teaching styles to the individual characteristics, diverse needs and interests of the players (Lyle & Cushion, 2010; Whipp et al., 2012). While there has been some research into the teaching styles of Physical Education teachers (Hasty, 1997; Curtner-Smith, Todorovich, McCaughtry & Lacon, 2001; Kulinna & Cothran, 2003; Cothran, Kulinna & Ward, 2000; Cothran, Kulinna, Banville, Choi, Amade-Escot, MacPhail, Macdonald, Richard, Sarmento, & Kirk, 2005; Jaakkola & Watt, 2011; SueSee, 2012), it has been suggested that coaches do not display analogous pedagogical characteristic to those of teachers (Hardin & Bennett, 2002; Nash & Collins, 2006). Similarly, in the discipline of sports coaching, research is limited to a narrow account of the practice activities and coaching behaviours of professional top-level coaches (Potrac et al., 2002; Smith & Cushion, 2006; Ford et al., 2010; Partington & Cushion, 2011). These assertions, however, act as timely reminders that we cannot unthinkingly presume the assignment of research findings from one context to another (Harvey et al., 2010). To the researcher's knowledge, it would seem that no published research to date has employed survey questionnaires, observations and interviews in a single research initiative to explore the teaching styles and insights of sports coaches.

5.1 Stage 1: Survey questionnaire

Results from the survey questionnaire generate sufficient data to provide an answer to the first research question proposed in this study:

1. What teaching styles do Junior Development (JD) and Club Professional (CP) tennis coaches in Australia believe they are using during coaching sessions throughout the year?

The data from the survey questionnaire component of the study, when considering the entire sample (n=208), indicated that coaches self-identified using all of the teaching styles on *The Spectrum* (Mosston & Ashworth, 2008) to some extent during their coaching sessions throughout the year. These findings suggest that the coaches believed that they employed a range of teaching styles from the *reproduction* and *production clusters* on *The Spectrum* (Mosston & Ashworth, 2008) during coaching sessions. On closer inspection, however, a more accurate interpretation concerning the frequency with which they believed that they used all the teaching styles emerged. Only three teaching styles were reported from *often* to *most of the time* by over 45 percent of Junior Development (JD) and Club Professional (CP) tennis coaches. These included: Practice Style-B (58.7%), Command Style-A (51.2%), and, Guided Discovery Style- F (46.2%). Practice Style-B and Command Style-A are located in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) and share similarities with direct instruction guidelines. Coaches who employ direct instruction enforce the majority of the instructional decisions during the session and players are directed to acquire and use this knowledge in ways stipulated by the coach. Guided Discovery Style-F is located in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008). This teaching style shares pedagogical principles associated with indirect and discovery instruction guidelines whereby the teacher or coach includes the players in decision making to promote discovery and creativity of knowledge and skills (Mosston & Ashworth, 2008)**.**

Despite coaches reporting the use of Reciprocal Style-C (JD=16.1%, CP=20.5%) and Self-Check Style-D (JD=20.7%, CP=21.8%) during coaching sessions, significant reservations exist whether strict adherence to the pedagogical principles representative of these styles were actually realised. The accurate adoption of Reciprocal Style-C and Self-Check Style-D demands the employment of a prepared (written) checklist for players to follow.[5] It is suspected, however, that practitioners believed that they were correctly implementing this style even though they might be employing a verbal checklist for players to remember and follow.[6] Although coaches predominantly reported using teaching styles in the *reproduction cluster,* two landmark teaching styles from the *production cluster* were in the top four styles most commonly self-identified by coaches. These styles were: Guided Discovery Style-F (JD =47.7%, CP=43.6%) and Divergent Discovery Style-H (JD=31.5%, CP=44.9%). It has been suggested, however, that Guided Discovery Style-F is the most demanding teaching style to implement.[7] A detailed description of the concepts that coaches use in their Guided Discovery Style-F lessons may in fact reveal that fewer coaches accurately implement the pedagogical principles of this style[8] even for part of a coaching session. It is also plausible that given the similarity in name that Guided Discovery Style-F shares with some instructional concepts common to tennis, coaches may view the terms as comparable. For instance, Australian tennis coach accreditation learner guides (Tennis Australia, 2010a; 2010b; Crespo & Reid, 2009) refer to discovery teaching styles. This instructional practice

[5] The use of a written checklist is considered crucial in the accurate use of Reciprocal Style-C and Self-Check Style-D.
[6] Prof. Sara Ashworth has indicated that some coaches may believe that they are using Reciprocal Style-C and Self-Check Style-D in their sessions despite employing a verbally stated criteria checklist for students to follow and remember.
[7] Prof. Sara Ashworth has indicated that Guided Discovery Style-F is the most difficult teaching style to employ.
[8] Given the complexities of Guided Discovery Style-F, Prof. Sara Ashworth has suggested that the accurate implementation of this teaching style is unlikely amongst tennis coaches who are unfamiliar with the style's concepts.

fundamentally promotes the use of coach-led questions to solve challenges and stipulates greater student involvement in the learning process. Similarly, other pedagogical approaches such as Teaching Games for Understanding (TGfU) and its Australian derivative, Game Sense, also refer to the term 'guided discovery'. These findings, however, have been reported as being quite common among teachers and coaches. According to Ashworth:

> Guided discovery is a teaching style most teachers/coaches think they do a lot of … The name is very familiar and they know it has to do with asking questions … They ask a lot of questions – so they think they are using Guided Discovery … but few represent Guided Discovery. (S. Ashworth, personal communication, April 16, 2012)

The results from the survey questionnaire in this study are comparable to related research that focused on the self-identified teaching styles of Physical Education teachers (Kulinna & Cothran, 2003, 2000; Cothran et al., 2005; Jaakkola & Watt, 2011; SueSee, 2012). These studies found that Physical Education teachers believed that they used a variety of teaching styles during lessons. Results also indicated that Practice Style-B and Command Style-A were identified as the most frequently employed teaching styles. The results from the survey questionnaire used in this study, however, must be interpreted cautiously. It is reasonable to suggest that some respondents lacked an understanding of the terms and/or misinterpreted the *scenario descriptions* used in the survey questionnaire. For instance, coaches reported usage of the Self-Teaching Style-K despite Mosston and Ashworth (2008) stating "this teaching style does not exist in the classroom" (Mosston & Ashworth, 2008, p. 290). Moreover, the *scenario description* used in the survey questionnaire to describe Self-Teaching Style-K clearly states "this style is independent of a coach and not initiated by a coach" (Hewitt et al., 2011). The coaches may have also wished to be seen as employing a variety of teaching styles including styles that highlighted the independence of the player and the coach as a 'facilitator'. Nonetheless, literature supports these findings and has suggested that teachers have a tendency to overestimate the frequency with which they report using teaching styles, (Cothran et al., 2006; Mosston & Ashworth, 2008). In addition, Good and Brophy (1997) observed:

> We have discussed behaviours that Physical Education teachers engage in without full awareness and noted that even when teachers are aware of their behaviour they may not realise its effects. We believe that teachers' lack of awareness about their behaviour or its effects lessens their effectiveness. (p. 35)

Mosston and Ashworth (2008) also reinforce the findings of this study indicating that "although teachers believe they use a wide variety of alternative behaviors in the classroom, they are, in fact, significantly uniform in their teaching behavior" (p. 293).

5.2 Stage 2: Observations

After establishing the teaching styles that tennis coaches believe that they employed during coaching sessions, an additional aspect of the study was to investigate the teaching styles that coaches actually used during coaching sessions. This stage of the study was designed to answer the second research question:

2. What teaching styles are Junior Development (JD) and Club Professional (CP) tennis coaches in Australia actually using during coaching sessions?

Providing an answer to this question would ultimately determine the level of congruence between the coaches' intention (what teaching styles they believe that they used) and action (what teaching styles they actually used). As outlined previously, 13 coaches were chosen to participate in **Stage 2** (observations) and **Stage 3** (interviews) of the study. Of this group, 12 coaches were selected to participate in three 30 minute observations during their accreditation coaching course. The total number of hours that the 12 coaches were observed in their sessions equalled 18 (i.e., 12 coaches x three 30 minute sessions). An additional coach was chosen to participate in an extended observation period of 18 hours over a six-day period at their place of work (i.e., tennis club). The following discussion refers to the teaching styles that were observed during the coaches' sessions. It is acknowledged that the results from **Stage 2** (observations) of the study were based on certain assumptions. It was assumed that the final number of coaches who participated in the observations was representative of all the coaches who enrolled in the accreditation courses at Tennis Australia (TA) and that the observed sessions were typical of the lessons employed at their place of work. It was also presumed that the individuals who coded the coaches' teaching styles received adequate training with regard to the observation tool and that this tool was reliable in identifying the coaches' usage of teaching styles during their coaching sessions.

Despite all the coaches who participated in the observations self-reporting the use of all teaching styles from the *reproduction* and *production clusters* of *The Spectrum* (Mosston & Ashworth, 2008) at some point during their coaching sessions throughout the year, when the video-recorded sessions were coded, two landmark teaching styles from the *reproduction cluster* were observed. These were landmark teaching style Command Style-A and landmark teaching style Practice Style-B. As a percentage of total time observed, the 12 coaches indicated that they employed landmark teaching style Practice Style-B for 12.87% of the time or for a total of 2.3 hours and landmark teaching style Command Style-A for 0.18% of the time or 1.9 minutes during their three 30 minute sessions. Among the 12 coaches, no other landmark teaching styles were observed. The findings from the 12 coaches' three 30 minute observations were almost indistinguishable from those of the single coach who was observed over an extended period of time (18 hours). As a percentage of total time observed, the single coach also performed two landmark teaching styles from the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008). As a percentage of total time observed, landmark teaching style Command Style-A was employed for 1.61% of the time (17.3 minutes) and landmark teaching style Practice Style-B was employed for 13.42% of the time or 2.4 hours from a total of 18 hours. No other landmark teaching styles were observed. It could be argued that the

exclusive use of these landmark teaching styles by the coaches in this study was not entirely unanticipated. To some extent, the results support anecdotal evidence pertaining to the instructional processes that tennis coaches employ during coaching sessions. It was surprising, however, that landmark teaching style Command Style-A was not employed more frequently by the coaches during their video-recorded sessions. It was equally unexpected that the coaches did not implement any teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) during their coaching sessions.

During the observations, the coaches were also observed performing teaching behaviour that approximated two landmark teaching styles in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008). It is acknowledged at this time that the variations that approximated the landmark teaching styles, termed canopy designs, were not provided as an option on the survey questionnaire for the coaches to consider and choose from. Rather, these teaching behaviours were subsequently identified during the observations and were included to understand the exact learning behaviour that was occurring during the coaching sessions. The survey questionnaire outlined only the 11 landmark teaching styles. Each of the 11 landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008) function as indicators that represent considerably different teaching and learning experiences. Located between the teaching styles are many, if not an infinite number, of teaching and learning experiences called canopy designs (Mosston & Ashworth, 2008).

As outlined earlier, two canopy designs were identified during the coaches' observations and subsequently labelled in this study. These were:

- Canopy design Command Style-A minus (-) pace and rhythm.
- Canopy design Practice Style-B plus (+) a social partnership to complete the task.

The abbreviated notation for canopy design Command Style-A minus (-) pace and rhythm is **Â-P&R**. The abbreviated representation of canopy design Practice Style-B plus (+) a social partnership to complete the task consists of: **B+socialisation**.

The assigned labelling for **Â-P&R** means that this particular teaching episode follows the decision structure of landmark teaching style Command Style-A while omitting the decision of pace and rhythm (**P&R**). In this case, the learner made the decisions with regard to speed or how quickly or slowly they decided to perform the task or activity. A common teaching episode or scenario of this variation during the coaches' observed sessions consisted of the following:

1. The coach demonstrated the serving action to the players in the group.
2. The players then copied or reproduced this action, imitating the cues and performance of the coach.

In this teaching scenario or episode, the coach made all the decisions relating to: subject matter, location (where the task is to be performed), posture, starting time, stopping time, duration and feedback. The only decision the coach did not make was the pace and rhythm (**P&R**) of the task or activity. The players decided how quickly or slowly they performed the serving activity.

The labelling for **B̂+socialisation** means that this teaching episode adheres to the decision structure of landmark teaching style Practice Style-B while adding the element of socialisation. The added decision of socialisation does not form part of the decision structure of landmark teaching style Practice Style-B. Instead, individual and private practice of a task or activity is a requirement of landmark teaching style Practice Style-B. An example of this variation that was frequently observed during the coaches' video-recorded sessions consisted of:

1. The coach explained the activity that involved the practice of the forehand and backhand groundstroke and encouraged players to comment
2. The players then practised this task with a partner.

In this teaching scenario or episode, the coach made all the decisions regarding the subject matter and logistics of the task, as well as providing private and individual feedback to the players. The players made the decisions relating to: location, the order in which the task is to be practised, starting time, pace and rhythm, stopping time, and initiating questions for clarification. The added decision in this scenario was socialisation. Rather than practising the task privately and individually, the players practised the task with a partner.

During the three 30 minute observations, the 12 coaches performed the canopy design that approximated landmark teaching style Command Style-A (**Â-P&R**) for 10.40% of the time or 112.32 minutes (1.87 hours) in addition to the canopy design that approximated landmark teaching style Practice Style-B (**B̂+socialisation**) for 71.38% of the time. This equated to 12.48 hours from a total of 18 hours. The single coach who was observed over an extended period of time was also observed performing the variation of landmark teaching style Practice Style-B (**B̂+socialisation**) for 72.05% of the time (13.04 hours), as well as the canopy design that approximated landmark teaching style Command Style-A (**Â-P&R**) for 9.44% of the time – or 1.6 hours (101.9 minutes). No other canopy designs were observed.

Although not originally planned or intended, this study, due to the type of and nature of the data that was collected, has provided the first account of research pertaining to canopy designs. It has also provided empirical evidence of the existence and employment of canopy designs during coaching sessions. In achieving these outcomes, this study has not only contributed to the current body of research that has employed *The Spectrum* (Mosston & Ashworth, 2008) (theory-testing) but has also extended the theoretical conception of this educational framework (theory-building).

In spite of the speculation and anecdotal evidence surrounding the frequent use of particular teaching styles, empirical research was necessary to reveal definitively the precise coaching behaviours of tennis coaches. An important factor that impacts on the quality of coach education, in addition to research in the field of pedagogy, is the capacity to identify and to differentiate reliably one teaching style from another (Ashworth, 2010). As diverse learning experiences are shaped by instigating different teaching styles, it is vital that the information and skills required to differentiate various teaching styles are constant and dependable (Ashworth, 2010). Indicating the distinction between landmark teaching styles and canopy designs in this study was imperative to understanding the exact behaviour that was occurring during the coaches' sessions. It also permitted the researcher to determine,

with greater accuracy, the level of congruence between what the coaches believed that they did and what they actually did.

The results outlined in this section of the chapter reveal information that provides an answer to the second research question:

2. What teaching styles are Junior Development (JD) and Club Professional (CP) tennis coaches in Australia actually using during coaching sessions?

The findings from the 12 coaches' three 30 minute sessions, in addition to the single coach who was observed for an extended period of time, reveal that the coaches actually employed only two landmark teaching styles during coaching sessions. These included: landmark teaching style Command Style-A and landmark teaching style Practice Style-B. No other landmark teaching styles were observed. The coaches also employed a canopy design that approximated the decision structure of landmark teaching style Command Style-A (**Â-P&R**) as well as a canopy design variation of landmark teaching style Practice Style-B (**B̂+socialisation)**. No other variations that approximated the decision structure of landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008) were observed. As outlined earlier in this chapter, the landmark teaching styles that were observed, as well as the behaviour that approximated these landmark styles, are located in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008).

Previous research that observed Physical Education teachers' use of teaching styles during lessons found that teaching styles in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) were most frequently observed (Hasty, 1997; Curtner-Smith, Hasty, & Kerr, 2001; Curtner-Smith et al., 2001; SueSee, 2012). These studies also revealed that Practice Style-B is the most pervasive teaching style employed by teachers (Hasty, 1997; Curtner-Smith et al., 2001; SueSee, 2012). The study by Hasty (1997), who observed the teaching habits of 20 teachers, found that they "spent the vast majority of time using the reproduction style termed "practice" in Mosston's Spectrum" (Hasty, 1997, p. 69). According to Byra (2007) "based on direct teacher observation, Styles A-E are used more frequently than styles F through H. Style B was used more frequently than any other Spectrum teaching style" (Byra, 2007, p. 4). SueSee (2012) discovered similar outcomes when observing the teaching styles of Physical Education teachers. This study employed a survey questionnaire and observations to explore the teaching styles that 110 Senior Physical Education teachers believed that they used during class in addition to observing nine teachers to assess the teaching styles that they were actually implementing. The results revealed that teachers reported using a variety of teaching styles yet when the video-recorded lessons of the nine teachers were coded, a variety of styles was not observed. The teachers predominantly used Practice Style-B during 27 observed lessons. It is interesting to note the level of congruence when reflecting on the results from **Stage 1** (survey questionnaire) and **Stage 2** (observations) of this study. As indicated earlier, the two landmark teaching styles that were observed are located in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008). This result was also largely consistent with what these coaches self-identified on the survey questionnaire.

Notwithstanding the congruence between the teaching styles in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) that the coaches

believed that they employed and what they actually used, some inconsistencies were evident. A noticeable discrepancy was realised between the self-identified use of teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) and what was evident during the observations. These findings were supported by SueSee (2012). This study revealed that senior Physical Education teachers reported using a variety of teaching styles yet after video-recorded lessons of nine teachers were coded it was found that a variety of teaching styles was not observed. SueSee (2012) identified all six teaching styles in the *production cluster* that teachers reported using during lessons. Divergent Discovery Style-H was the third most commonly reported teaching style (73.6%) behind two teaching styles located in the *reproduction cluster*. These included: Command Style-A (77%) and Practice Style-B (94.5%). In spite of these findings, only one participant was actually observed using one teaching style in the *production cluster*. As a percentage of total time observed, Convergent Discovery Style-G was observed for 0.7% of the time. The inconsistencies were even more discernible in the current study. Regardless of the reported use of teaching styles in the *production cluster* by tennis coaches, none was actually observed. Guided Discovery Style-F was the most commonly reported teaching style from *often* to *most of the time* among the 12 tennis coaches (66.7%) as well as the single coach who was observed for 18 hours (72.4%).

As indicated earlier, the notion that teachers believe that they employ a wide range of instructional practices despite actually implementing only select behaviours is corroborated in the literature (Mosston & Ashworth, 2008). This outcome suggests that there is a lack of congruence between the teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) that tennis coaches believe that they use and what they actually use. This assertion is based on the *scenario descriptions*.

Similar to the findings of Yates et al (2008), the results in this study demonstrated that a substantial gap exists between the production of progressive and contemporary research evidence and its application in coach education (Farrow et al., 2008; Williams & Hodges, 2005). These findings contradicted contemporary research in the areas of skill acquisition, motor learning and performance (Farrow, Baker, & McMahon, 2008; Williams & Hodges, 2004, 2005). All the coaches who participated in **Stage 2** of this study were observed providing high levels of direct and prescriptive instruction to players during their coaching sessions. Researchers, however, have highlighted the potential advantages of employing less prescriptive and direct forms of instruction (Masters, 2000; Masters & Maxwell, 2004; Williams & Hodges, 2005; Wulf, 2007). Previous research has indicated that a traditional pedagogy that is exemplified by being highly directive or autocratic and prescriptive remains the most employed instructional practice in many sports among coaches of elite players (Miller, 1992; Millard, 1996; Kahan, 1999; Cushion & Jones, 2001; Williams & Hodges, 2005; Potrac & Cassidy, 2006; Potrac et al., 2007; Ford et al., 2010; Harvey, Cushion & Massa-Gonzalez, 2010; Partington & Cushion, 2011). Although the provision of direct instruction is considered a critical component of the coaching process, some researchers have recommended caution with being excessively prescriptive and direct during practice for extended periods of time (Davids, Button, & Bennett, 2008; Williams & Hodges, 2005).

The frequent application of verbal instructions, demonstrations, and feedback is claimed to generate an excessive amount of information for players to

process, thereby preventing them from engaging in the problem solving process. This aspect, however, was not explored in this study. Furthermore, it is asserted that the explicit nature of the content is readily forgotten and interrupts automatic motor processes, particularly when the learner becomes exposed to stressful and anxious situations (Jackson & Beilock, 2008; Masters, 2008). It is also suggested that an overly prescriptive approach to instruction and feedback may result in a subordinate recollection and transfer of skill to competition when compared with a method where verbal instruction, demonstrations, and feedback are provided less habitually (Hodges & Franks, 2004; Wulf & Shea, 2004). In response to these asserted limitations, a more *hands-off* and implicit approach to instruction has been encouraged (Renshaw, Chow, Davids & Hammond, 2010).

In order to achieve these outcomes, a focus on employing teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) would seem appropriate. The teaching styles in this *cluster* represent options that invite the production (discovery) of new knowledge, These styles also accentuate the development of decision making skills and advocate the learner participating in tactical problem-solving and the decisions regarding the *how*, *why* and *what* of student learning. These styles include coaches or teachers facilitating or guiding players to explore options through techniques such as questioning. This is opposed to the coaches' current behaviour of constantly telling or directing the players during coaching sessions in this study. However, as diverse learning conditions and experiences are often created by employing different teaching styles, the necessity for coaches to understand and implement purposefully a variety of teaching styles to achieve learning outcomes would seem paramount. This strongly suggests that tennis coaches should assess the learning objectives of the session and employ the most appropriate teaching style(s) rather than exclusively implementing the same teaching style repeatedly.

As outlined previously, tennis involves learning aims, objectives, skills and knowledge from a number of domains including: the psychomotor (physical/motor skill), cognitive (decision making), and affective (enjoyment/motivation) domains. This might indicate the application of specific teaching styles to develop comprehensively each learning area. According to Morgan (2008), developing physical skills in the psychomotor domain is the "most obvious one and should involve the development and application of core techniques and skills and the application of these to competition-specific situations" (p. 11). In this case, implementing teaching styles in the *reproduction cluster* is considered most appropriate. Goldberger and others (2012) have suggested that landmark teaching style Practice Style-B and its many associated canopy designs located in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) present a highly effective teaching style in achieving basic motor acquisition (Goldberger et al., 2012). If, however, developing the cognitive domain is a priority, Morgan contends that teaching styles in the *production cluster*, such as Guided Discovery Style-F, may be more suitable. The importance of adopting appropriate teaching styles to cater for the requirements of a particular learning domain is further supported by Goldberger and others (2012). These authors assert:

> If learning motor skills was the only goal of physical education, using formats of the practice style almost exclusively could make sense. However, given the variety of important goals in American education and the differing

> circumstances teachers find themselves facing, we believe the more comfortable and competent a teacher is in using a variety of pedagogical approaches available (including different teaching styles) the more effective she/he could potentially be. (p. 274)

Considering this, the primary employment of landmark teaching style Practice Style-B in addition to the canopy design that approximated the decision structure of this landmark style (**B+socialisation**) observed in this study may not be entirely appropriate when coaching tennis. The results of the observations and the information above would indicate that the coaches in this study were not committing sufficient attention to developing the cognitive learning domain of their players. This domain represents knowledge of tactics, strategies and decision making during game-play as well as in technique development. The coaches in this study employed the same landmark teaching styles and canopy designs throughout each coaching session thereby repeatedly reinforcing the same set of learning behaviours and objectives. This shows that coaches did not vary the teaching styles that they employed during coaching sessions. This presumes that the coaches know how to teach using alternative styles. As a result of their limited use of teaching styles, the coaches did not offer players developmental opportunities beyond a limited range (i.e., motor skill development in the physical learning domain). There often exists a range of objectives across a number of learning domains that practitioners are attempting to develop. It is therefore recommended:

> The more comfortable and competent a teacher is in using a variety of pedagogical approaches available (including different teaching styles) the more effective they could potentially be – mobility ability, the skill of easily moving from one teaching style to another as circumstances suggest, is what we wholeheartedly endorse. (Goldberger et al., 2012, p. 274)

As no one teaching style encompasses all learning eventualities, an effective coach must have the capability to change, combine and transition between various teaching styles during sessions. Furthermore, it is strongly advocated that the behaviour of coaches act as an avenue to link player understanding to the content presented in the session (Hall & Smith, 2006). Therefore, it is crucial that coaches "consider the objectives of the session, so that he or she can determine whether given behaviours are relevant to the task" (Lyle & Cushion, 2010, p. 52). Effective coaches have the ability to "tailor their content and instruction to the specific learning readiness and interests of their students, by integrating concepts and implementing teaching strategies that are responsive to the students' diverse needs" (Lyle & Cushion, 2010, p. 52). In order to design an optimal learning environment, coaches should be "less concerned about a coaching style or behaviour and more concerned about whether whatever they do impairs or facilitates learning" (Lyle & Cushion, 2010, p. 53). Coaches who possess the capacity to be receptive and flexible, and who can differentiate among their instructional practices are ideally positioned to augment learning outcomes for all their players (Cain, 1989). For that reason, "there is no one size fits all approach" (Lyle & Cushion, 2010, p. 54).

While survey questionnaires and observations can generate useful descriptive data about coaching practices, they cannot, however, "provide an insight into why coaches do what they do" (Potrac et al., 2000, p. 192). It is argued that

behavioural research alone does not possess the capacity to offer detail surrounding the cognitive processes that underpin coaching behaviours (Cushion & Jones, 2001; Potrac et al., 2007; Rosado & Mesquita, 2009; Ford et al., 2010). In the absence of interview data related to this specific area, one can only hypothesise about the reasons that may account for the incongruencies that were found from the results of the survey questionnaire and observations. For instance, it may be plausible to suggest that the participants did not fully understand the teaching style scenarios presented in the survey questionnaire. Similarly, the participants' interpretations of these scenarios in the survey questionnaire may be vastly different. One specific feature of coaching that may benefit from such a holistic mode of inquiry is the exploration of the pedagogical practices employed by coaches within the practice environment (Potrac et al., 2006). Therefore, in an attempt to maximise the veracity of the study and to provide a more profound understanding of the aspects that coaches believed explicated their performance, interviews were implemented. A discussion of the findings from the interviews is presented in the following section.

5.3 Stage 3: Interviews

Stage 3 (interviews) of the study was designed to answer the third research question:

3. What are the coaches' insights of the teaching styles they employ during coaching sessions?

Stage 3 also sought to explore the motivations that underpinned the employment of the coaches' decisions to employ these teaching styles during their observed coaching sessions. It contributed partly in responding to the requests of some experts that in order to comprehend the nature of coaching, research initiatives should be directed at the domain of individual coaches, and how they function within their given contexts (Potrac et al., 2002). Correspondingly, research that attends to the individual interpretations of coaches' experiences, understanding and knowledge and the processes that guide their actions during practice is recommended and necessary (Potrac et al., 2002; Smith & Cushion, 2006; Harvey et al., 2010). In this part of the discussion, the researcher refers to all the coaches who participated in **Stage 3** (interviews) of the research as a collective group (n=13). The researcher deemed it prudent to combine the group owing to the same interview schedule (i.e., interview questions; duration of interview) in addition to similar conclusions emanating from the participants' responses.

An analysis of the coaches' narratives indicated that observing and/or discussing aspects of coaching with a mentor as well as playing experience had a greater influence on current coaching behaviour than attending an accreditation course. These reflections were consistent with other research findings. In a review of the development of coaching as a profession, Woodman (1993) suggested that the basis of improved coaching lies with coach education and development programs. Considering that coaching accreditation is acquired following the successful completion of a formal course it might be expected that this source of learning would serve as the most important. However, there exists evidence that formal education

accreditation programs are only one of a number of methods that coaches consider important in learning to coach.

To date, a number of scholars have empirically approached the critical question of how coaches learn and to what value they attribute these methods to becoming coaches (Bloom, Durand-Bush, Schinke & Salmela, 1998; Bloom, Salmela & Schinke, 1995; Cote, Salmela, Trudel, Baria & Russell, 1995; Fleurance & Cotteaux, 1999; Gould, Krane, Giannini & Hodge, 1990; Irwin, Hanton & Kerwin, 2004; Jones, Armour & Potrac, 2004; Lemyre, Trudel & Durand-Bush, 2007; McCullick, Belcher & Schempp, 2005; Salmela, Draper & Desjardins, 1994; Salmela, 1995; Schinke, Bloom & Salmela, 1995; Wright, Trudel & Culver, 2007). While there is some disparity among these studies as to the perceived level of importance of formal coach accreditation programs, there is agreement that other learning experiences perform a substantial role in the acquisition of knowledge. These alternative experiences include: playing experience, mentoring, discussions with other coaches, observation and professional experience.

The responses to interview question 1: "Could you identify or tell me what has or have been the major influences on the *way* you currently coach?" showed that no coaches in this study mentioned the impact or influence of the formal accreditation coaching course that they were currently completing. This information presents important ramifications for continuing professional development. As a majority of the coaches identified a mentor as exercising the greatest degree of influence on the *way* that they coached tennis, it is incumbent upon coach education providers to explore avenues that may provide a more profound impact on the coaches' instructional processes during accreditation courses. Furthermore, education initiatives involving the mentors of course participants may also prove beneficial. This might consist of information pertaining to the benefits of implementing a variety of teaching styles in addition to a greater awareness of the theoretical assumptions that underpin these practices.

The findings also revealed that coaches in his study utilised a variety of terms to describe the *way* that they coached, and that many of these terms were used interchangeably. The responses recorded by the coaches share similarities with other research. According to Bailey and Macfadyen (2007) teaching models, strategies, approaches, methods, styles, practices and formats are terms that have been employed interchangeably in educational literature. Similarly, Ashworth (1998) has reported that classroom teaching-learning procedures have been directed by the following terms including: teaching models, strategies, styles, methods, behaviours, techniques and practices. In a review of the literature that clarified the specific definitions and distinct purposes of these terms, Ashworth found that these terms are:

- Common, frequently used, and often interchanged in our professional literature.
- Not in competition, but rather used as synonyms.
- Used to offer recommendations about how to structure the teaching/learning interaction. (p. 119)

The study by Ashworth also revealed that "the data did not support any consistent or precise definition for these individual terms; rather the definitions of these teaching

options (methods, styles, strategies, etc.) were arbitrary and personalised according to each author's usage" (p. 119). Correspondingly, many tennis coaching accreditation manuals use terms interchangeably when referring to particular instructional practices. Coach education accreditation manuals from the International Tennis Federation (ITF) and Tennis Australia (TA) describe teaching styles (command, direct, indirect and discovery) and coaching approaches (traditional, technique-centred, game-centred, game-based, integrated, situational, complex, total, holistic, constraints-based and modern) (Crespo & Reid, 2009; Tennis Australia, 2010a, 2010b). Furthermore, some scholars have asserted:

> In tennis, the conceptualisation of different coaching approaches or philosophies has been confounded by disparate terminology and coaching parlance. This has led to a certain ambiguity in global tennis coaches' education and exacerbated the extent to which the instruction of the game is anecdotally based. (Reid et al., 2007, p. 1)

What appears to be lacking in these publications is a framework of common terminology that clearly defines specific *ways* that are available for tennis coaches to coach during coaching sessions. In the absence of consistency in terminology, "reliable communication, accurate implementation, and assessment of ideas are difficult if not impossible" (Mosston & Ashworth, 2008, p. 3). Moreover, the inconsistent use and understanding of terminology creates confusion and leads to the misinterpretation of events that ultimately limits educational practice (Mosston & Ashworth, 2008). It could be asserted that the anecdotal declarations by some researchers in connection to tennis coaches using "disparate terminology and coaching parlance" (Reid et al., 2007, p. 1) have been empirically supported in this study. However, the authors' notional suggestions about coaches maintaining varied definitions in relation to some teaching styles were not realised in this study. In spite of the coaches describing a range of terms that were often used synonymously, their definition and interpretations were remarkably similar. For instance, common definitions and interpretations among the interviewed coaches of a Game-Based Approach (GBA) consisted of:

> I mainly used a Game-Based Approach (GBA). In all the lessons I tried to get the students to figure out the answers for themselves … I asked questions and got them to discover for themselves. (Jimmy, CP coach interviewee, July 21, 2011)
>
> The coach should not tell the kids what to do, but ask lots of questions and just let them figure it out and make all or most of the decisions, explore the solutions and create the answers to the activities or technical problems they are having. This is a Game-Based Approach (GBA) essentially. (Tim, JD coach interviewee, July 30, 2011)

These conceptions align with many of the recommended practices associated with indirect instruction. The implementation of questions requires a player to implement different levels of thought processes to respond and is considered a beneficial coaching behaviour that promotes a player's active learning through problem solving, discovery, and an awareness of performance (Chambers & Vickers, 2006). As indicated earlier, a noticeable discrepancy was realised between the self-identified use of teaching styles in the *production cluster* of *The Spectrum* (Mosston &

Ashworth, 2008) and what was evident during the observations. Teaching styles in the *production cluster* share pedagogical principles associated with indirect and discovery instruction guidelines whereby the coach includes the students in decision making to promote discovery and creativity of knowledge and skills (Mosston & Ashworth, 2008). The findings of this study demonstrated that all the coaches who were observed provided highly prescriptive and direct instruction during their observed coaching sessions. In spite of this, all the coaches during the interviews stated that they believed that they created a learning environment that encouraged players to make decisions and respond to questions about technical and tactical skills and challenges. The coaches also commented that encouraging players to become involved in the decision making process during coaching sessions was the most effective avenue for developing tennis players. This aspect can be seen in the following comment:

> The Game-Based Approach (GBA) produces better learners, better players. They work it out for themselves and remember better. Telling kids what to do doesn't really work, won't help them on the weekend when they are playing, they get to rely on the coach too much when it's technique and or traditional. When kids work it out themselves and on their own they learn more and remember better. (Tegan, JD coach interviewee, July 1, 2011)

Beyond mentioning that these types of instructional processes were the most effective when conducting coaching sessions, the coaches were unable to explain why this was so. This situation was perhaps similar to what Light (2008) calls an epistemological gap or cognitive dissonance. This is evident when practitioners utilise the language of particular instructional guidelines or *ways* of coaching, but persist in coaching in an alternative *way* owing to a lack of understanding (Davis & Sumara, 2003; Light, 2008). Similar to previous research (Knowles, Gilbourne, Borrie & Nevill, 2005; Smoll & Smith, 2006; Partington & Cushion, 2011), the results of the interviews suggested that coaches were incapable of accurately describing their individual coaching behaviours. This strongly indicated that the coaches exhibited a reduced self-awareness of their coaching in practice. This point was further demonstrated when the coaches were requested to provide feedback and commentary after viewing their video-recorded coaching sessions prior to the interview. All the coaches expressed a high degree of surprise and disbelief as to what transpired during these coaching sessions. Each coach indicated and acknowledged an apparent lack of compatibility about what they believed had happened during the sessions and what actually ensued with regard to the *way* that they coached. All the coaches strongly believed that they had coached in a particular *way* that emphasised the following areas:

- Asking the players to respond to questions about technical and tactical skills and challenges.
- Permitting the players to engage primarily in game-play and rallying.
- Allowing the students to solve technical and tactical skills and challenges independent of the coach and not directly and prescriptively informing the players what to do or how to do it.
- Limited ball *feeding*.

In spite of this, all the coaches identified an essential component of the learning environment that was corroborated in current literature. The insights of the coaches in this study provided support for Bunker and Thorpe's (1986) assertion that Game-Centred Approaches (GCAs) can stimulate player motivation and by extension player enjoyment and fun. GCAs strongly encourage the employment of questions to stimulate players' learning. Common responses among all the coaches with regard to employing GCAs consisted of: "It's more fun" (Tegan, JD coach interviewee, July 1, 2011), "It's heaps of fun" (Bill, CP coach interviewee, July 12, 2011), and "It's the most fun approach" (Travis, JD coach interviewee, July 8, 2011).

In connection with learning in the affective domain (i.e., emotion, fun, enjoyment) Oslin and Mitchell (2006), found that GCAs were considered to be more enjoyable, and learners reported elevated levels of motivation when participating in Physical Education lessons (Griffin et al., 1995). Similarly, research conducted by Thomas (1997, as cited in Pearson, Webb & McKeen, 2005; Light (2003) and Light and Georgakis (2005), repeatedly discovered that Teaching Games for Understanding (TGfU) produced increased enjoyment and empowerment, greater engagement and improved physical activity levels in learners. Since 2006, there has been a noticeable increase in the volume of research that has explored learning in the affective domain (Harvey & Jarrett, 2013). These initiatives have provided support for the claims that GCAs "can be more fun than doing drills and that students can be motivated when taught with these approaches" (Harvey & Jarrett, 2013, p. 14).

Although research has been conducted into the adeptness of GCAs compared with the Technique-Centred Approaches (TCAs), evidence of the authority of one or the other concerning the development of motor skill acquisition is equivocal (Oslin & Mitchell, 2006). Similar inferences were determined in a review of GCAs to teaching and coaching literature since 2006 (Harvey & Jarrett, 2013). The results from the interviews in this study revealed, however, that the coaches fervently believed that GCAs, consisting of high levels of indirect instruction, are the most effective *way* to coach tennis. This might indicate that the coaches appreciated the importance and benefits of these types of instructional processes in developing the affective domain. The following comment provided an accurate overview and representation of what all the coaches thought about employing GCAs:

> The Game-Based Approach (GBA) produces better learners, better players. They work it out for themselves and remember better. Telling kids what to do doesn't really work, won't help them on the weekend when they are playing, they get to rely on the coach too much when its technique and or traditional. When kids work it out themselves and on their own they learn more and remember better. (Tegan, JD coach interviewee, July 2, 2011)

Throughout the course of the interviews, all 13 coaches commented that the choice and employment of a particular *way* of coaching did not alter as a function of the age or ability of the players whom they coached. Each of the coaches specified that they used the same *way* of coaching in all of their observed coaching sessions regardless of the age level or ability of their players. Furthermore, nearly all the coaches stated that they did not believe that they should be required to change the *way* they coach. The six Club Professional (CP) coaches, who primarily instructed players of an intermediate level between the ages of 6 and 8 years, stated that they employed the

same *way* of coaching regardless of the age or ability of the player. The responses from the seven Junior Development (JD) coaches who spent most time coaching players of a beginner level aged between 4 and 5 years indicated similar thoughts. The following comments provided by two of the coaches were common among all the coaches:

> I pretty much instruct the same way with everyone, or at least I try and do it this way… it's my style to let kids and adults for that matter discover the skills of what to do on their own. (Patrick, JD coach interviewee, July 12, 2011)

> I don't think coaches should have to change their style. The Game-Based Approach is just a better way to coach, so it can be done with all players. It doesn't really matter what the age of the player is, or the level really, you might have to ask easier questions to the younger kids, but, that's about it. All kinds of players find this a more fun way to learn. (Bill, CP coach interviewee, July 15, 2011)

These beliefs are in stark contrast to literature concerning the use of various teaching styles (Dill, 1990; Jewett & Bain, 1985; Tomlinson, 1995, 1999; Rink, 2001; Byra, 2006; Rukavina & Foxworth, 2009; Whipp et al., 2012). A common conception among these authors stipulates that coaches should cater and respond to the needs of all learners, with consideration being provided to the player's, developmental readiness, interest, and competence. Metzler (2011) has indicated that the decision to employ direct or indirect instruction is contingent on a number of factors. These factors incorporate the coaching context and environment, learning outcomes and the players' developmental stage. Whereas, the learning outcomes are considered by some as the primary reason when determining whether to employ direct or indirect instruction considerable thought should also be assigned to the players' stage of development (Metzler, 2011). Moreover, MacFadyen (2007) has suggested that the "year group being taught will tend to shape which styles can be profitably utilised" (p. 46). As some learners may possess limited comprehension of certain aspects of a particular activity or part of the curriculum, teachers or coaches may be required initially to perform a greater role in instruction (MacFadyen, 2007). This may include adopting certain teaching styles to cater to the developmental readiness of particular learners. Mawer (1995) suggests that "as no one method covers all eventualities, the effective teacher will have the ability to switch, mix, and blend teaching strategies to suit his objectives and pupil responses" (p. 228). These recommendations serve to promote pedagogical sentiments such as: "there may not be a best way to teach, but there may be a best way to teach particular content to particular learners" (Rink, 2001, p. 123).

While the sample of coaches interviewed for this stage of the study limited its capacity for generalisation to all tennis coaches it does provide worthwhile information with regard to the insights into the teaching styles that coaches employ during coaching sessions. It also offers support for the claim by Cushion and colleagues (2003) that coaching is a complex process that has been oversimplified in the coaching literature and in coach development programs. More specifically, it highlights that coaches in this study lacked knowledge concerning the theoretical and practical application of various teaching styles required for coaching. It additionally

revealed that coaches lacked self-awareness and an understanding in relation to their own coaching performance.

The points discussed here have implications for curriculum initiatives in coach education as well as for future professional development opportunities. The learner guides used in the accreditation coaching courses in Australia recommend that tennis coaches should combine the use of direct and discovery teaching styles with the latter nominated as the preferred teaching style (Tennis Australia; 2010a, 2010b). The predominant use of teaching styles in the *reproduction cluster* is not necessarily compatible with the favoured teaching processes identified in these publications. The necessity for coaches to understand and purposefully implement a range of teaching styles to achieve various learning outcomes is paramount. As no one teaching style encompasses all learning eventualities, an effective coach must possess the capability to change and combine teaching styles during sessions.

CHAPTER SIX: CONCLUSION

6.1 Introduction

This chapter provides a summary of the research findings in addition to the assumptions, limitations, recommendations and recent developments. With regard to chapter structure, after the key findings have been highlighted, a discussion of the assumptions that the researcher maintained prior to the commencement of the research is outlined. This is followed by an account of the limitations, before the researcher details the recommendations that were developed in response to the findings of the study. A closing comment relevant to the study as a whole is then provided.

6.2 A summary of the research

This study has presented the findings of research completed on the self-identified teaching styles of 208 Junior Development (JD) and Club Professional (CP) tennis coaches in Australia as well as the observed teaching styles of 12 tennis coaches from three 30 minute coaching sessions each. As well as these observations, an additional coach participated in an extended observational period of 18 hours of coaching at their local tennis club. This study also explored the coaches' insights of teaching styles in addition to the motivations that informed their decisions to employ particular teaching styles during coaching sessions. *The Spectrum* (Mosston & Ashworth 2008) was used as a basis for identifying the coaches' teaching styles. The specific aims of the research were to pursue answers to the following research questions:

1. What teaching styles do Junior Development (JD) and Club Professional (CP) tennis coaches in Australia believe they are using during coaching sessions throughout the year?

2. What teaching styles are Junior Development (JD) and Club Professional (CP) tennis coaches in Australia actually using during coaching sessions?

3. What are the coaches' insights of the teaching styles they employ during coaching sessions?

As previously outlined, exploring the teaching styles of tennis coaches may provide assistance in identifying *how* coaches facilitate learning and *why* coaches decide upon the application of teaching styles during coaching sessions. Only through an understanding and awareness of coaching behaviours does theorising about current limitations become likely. The identification of different features within pedagogical behaviour among tennis coaches in Australia will be particularly crucial to enhancing coach education programs – namely on a content and learning strategies basis. Owing to these reasons it would appear necessary for coach education providers to understand what teaching styles tennis coaches are presently employing and if they are using a range of teaching styles as recommended by coach education providers. Equally important are the motivations that serve to guide these practices.

The study results show that JD and CP tennis coaches in Australia do not use a range of teaching styles during their coaching sessions throughout the year. Despite all the coaches who participated in the observations self-reporting the use of all teaching styles from the *reproduction* and *production clusters* of *The Spectrum* (Mosston & Ashworth, 2008) at some point during their coaching sessions throughout the year, when the video-recorded sessions were coded, only two landmark teaching styles from the *reproduction cluster* were observed. These were landmark teaching style Command Style-A and landmark teaching style Practice Style-B. These results indicated a lack of congruence between the teaching styles that coaches believed they employed and the teaching styles they actually implemented. This suggests a lack of knowledge in relation to the application of various teaching styles in addition to an absence of self-awareness in relation to the coaches' own performance. While the primary use of these landmark teaching styles was not a completely unexpected outcome (based on the researcher's experience in coach education and anecdotally) it was surprising that the coaches did not use any teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) at any stage during their observed sessions. These teaching styles share pedagogical principles associated with indirect and discovery instruction guidelines whereby the teacher or coach includes the players in decision making to promote discovery and creativity of knowledge and skills (Mosston & Ashworth, 2008). The coaches in this study primarily employed landmark teaching style Practice Style-B in addition to a variation that approximated the decision structure of this landmark teaching style. This variation was labelled **B̂+socialisation**. These coaching behaviours are located in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) and strongly correlate with direct instruction where the coach makes all the decisions in relation to *what* the player is learning in addition to *how* and *why* they are learning it. This indicates that coaches do not vary the teaching styles they employ during coaching sessions and do not provide learning opportunities to players beyond a restricted range (i.e., motor skill development in the physical learning domain). Goldberger and others (2012) have suggested that landmark teaching style Practice Style-B and its many variations are an ideal teaching style when the primary goal is developing basic motor skills. The learning aims and objectives in tennis, however, also include the cognitive domain which represents knowledge of tactics, strategies and decision making during game-play. The employment of certain teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) may be more appropriate when the objectives entail decision making to promote discovery and creativity of knowledge and skills with some players. Instead of catering to all the learning domains required for learning tennis, the coaches in this study repeatedly reinforced the same learning behaviours and objectives in each coaching session.

This study also has provided the first account of empirical research regarding canopy designs. Describing the difference between landmark teaching styles and canopy designs was crucial to understanding the exact coaching behaviour that transpired during the observed sessions. Additionally, it allowed the researcher to establish with increased accuracy, the level of congruence between what the coaches believed they did and what they actually did. According to Goldberger and colleagues (2012), "clarity and precision are critical in understanding the Spectrum and its implications" (p. 274). Ashworth (2010) advocates that when "discussing, implementing, assessing or conducting research it is imperative that a correct distinction be made as to the identification of the observed teaching events-landmark or canopy" (p. 3). Furthermore, Ashworth posits that canopy designs cannot be

assessed or labelled in the same manner as landmark teaching styles. Canopy designs only share approximate learning objectives, decision structures and the developmental focus of the landmark teaching style(s) they are located near or in between (Ashworth, 2010).While this notion has been comprehensively outlined previously, it is relevant to reinforce at this point.

The interviews showed that the terms the coaches used to describe teaching styles lacked consistency and accuracy and were often used interchangeably. It was also revealed that coaches were incapable of accurately describing and identifying their own teaching styles during their observed lessons. This suggests that coaches exhibit a reduced self-awareness of their coaching in practice. This presents as a major concern as "self-awareness is needed for coaches to understand the implications (good or bad) of their behavior" (Partington & Cushion, 2011, p. 7). However, the findings established that despite the coaches' limited awareness of the teaching styles they performed during the observed sessions, they were able to articulate specifically the type of environment they wished to produce and behaviours they wanted to encourage. The coaches referred to concepts such as: asking the players questions, allowing the players to solve challenges independently, and not prescriptively informing the players *what* to do or *how* to do it during sessions. These behaviours strongly correlate with indirect instruction guidelines, where the decisions regarding the *how, why* and *what* of learning are shared with the coach. These findings are in line with contemporary research that highlights the potential advantages of employing less prescriptive and direct forms of instruction (Masters, 2000; Masters & Maxwell, 2004; Williams & Hodges, 2005; Wulf, 2007). In spite of all the coaches advocating the employment of teaching styles that share similar pedagogical principles with indirect instruction they were unable to explain the theoretical assumptions that underpin these practices. This stage of the study also revealed that the coaches' choice and usage of a particular teaching style did not alter as a function of the age or ability of the players they coached. This perturbing viewpoint is in stark contrast to literature concerning the use of various teaching styles. This showed that coaches are not necessarily catering and responding to the individual needs of their players' developmental readiness, interest, and competence.

Conducting research as a means to acquire a more coherent understanding of teaching styles and tennis coaching has been a thought-provoking and challenging pursuit. With regard to conducting a research agenda in sports coaching, scholars have signalled the necessity to "site coaching research within practice and the practice community" (Lyle & Cushion, 2010, p. 9). In relation to this point, Marx contended: "all social life is essentially practical. All the mysteries that lead theory toward mysticism find their rational solution in human practice and in the comprehension of this practice" (as cited in Bottomore & Rubel, 1963, p. 84).

It has been identified that the association between research and practice, and researchers and practitioners requires further development (Lyle & Cushion, 2010). There remains a growing need to ensure that research initiatives diametrically stem "from practice, are seen to be relevant to the problems and challenges of the day-to-day work of the coach, and of course, have an appropriate level of utility for coach education and development, improved practice and more effective coaching" (Lyle & Cushion, 2010, p. 9). Researchers have been alerted to the need for "concept and theory building, but not losing sight of the danger of isolation from the practitioner

community" (Lyle & Cushion, 2010, p. 10). In the same way, a foremost intention of this study has been to impact directly on the everyday coaching practices of tennis coaches. This objective is coupled with the additional purpose of informing and extending coach education providers' knowledge regarding the theoretical conceptions of the coaches' behaviour during coaching sessions.

6.3 Assumptions and limitations

It is acknowledged that the researcher maintained particular assumptions about some of the eventual outcomes of the research. As suggested earlier, the results somewhat supported anecdotal evidence in relation to the teaching styles that the coaches employed during **Stage 2** (observation) of the study. The exclusive implementation of landmark teaching style Practice Style-B and landmark teaching style Command Style-A was not completely unexpected. However, based on the researcher's experience and anecdotally, it was assumed that the coaches would employ landmark teaching style Command Style-A more regularly. It was also assumed that the coaches would be observed employing teaching styles from the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008) at some point during their coaching sessions. However, after the coding and analysis of their coaching behaviour during observations, it was found that they did not employ any teaching styles from the *production cluster*. The results from the interviews also dismissed certain assumptions that the researcher had made in relation to the coaches' insights of the teaching styles that they employed during coaching sessions. The researcher had presumed that the coaches would possess a greater awareness of their coaching behaviour during sessions. It was also assumed by the researcher that the coaches would have a more comprehensive and accurate understanding and interpretation of various teaching styles. After investigating the narratives of coaches during the interviews, however, it was established that the coaches lacked knowledge in relation to the theoretical application of various teaching styles, as well as awareness with regard to their own coaching behaviour.

A significant amount of attention and consideration was afforded to the development of the research questions, the methodology that provided an avenue to address the research questions, data analysis, and the subsequent findings of the research. In spite of this, the researcher openly acknowledges the presence of a number of apparent limitations that are associated with this study. These limitations are listed below:

- The number of participants for the observations and interviews.
- The number of observations.
- The frequency and duration of the interviews.
- Employing the descriptions of the landmark teaching styles on *The Spectrum* (Mosston & Ashworth, 2008).
- A representative sample of all tennis coaches in Australia.
- The generalisability of data and findings about the observations and interviews.
- The relative inexperience of coaches based on their age and other characteristics.

Conducting the study with a larger sample of participants for **Stage 2** (observations) and **Stage 3** (interviews) of the study may have provided the study with a capacity to generalise the findings across the population of JD and CP tennis coaches in Australia. However, the researcher did make a concerted effort to secure the maximum number of participants for these stages of the study. Nonetheless, it could be claimed that the participants in these stages of the study provided a reasonably accurate representation of the characteristics of JD and CP tennis coaches in Australia.

Despite all efforts, coaches from some states and territories in Australia were not represented in this study. There were two primary reasons for this occurrence. In the first instance, the enrolments in some of the courses were deemed exceedingly low and therefore the course was not conducted. Another reason related to the number of formal coach accreditation courses that individual states and territories conduct each year. This situation is also related to the number of enrolments that are submitted. It has been acknowledged that the large majority of tennis coaches in Australia reside and work in Victoria (VIC), New South Wales (NSW) and Queensland (QLD). Therefore, all the coaches from these states were represented in **Stage 2** (observations) and **Stage 3** (interviews) of the study, while an overwhelming majority of the coaches who participated in **Stage 1** of the study (survey questionnaires) were also from VIC, NSW and QLD. The opportunity to employ a greater number of observations may have delivered a stronger case about the coaches' use of teaching styles during all their coaching sessions – not just those that were observed during the course of this study. It would seem reasonable to suggest that the more time that individuals are observed the more comprehensive the claims can be with regard to their everyday coaching behaviour. In an attempt to alleviate this potential limitation, the author conducted an extended observational period of 18 hours with a single coach at their workplace (local tennis club). Given that the results of this extended observational period with the single coach shared analogous findings with those of the 12 coaches, it is plausible to suggest that the teaching styles observed among all coaches could be considered broadly representative. The opportunity to observe a larger sample of coaches for a longer duration of time would have undoubtedly supported the researcher's ability to generalise the findings of this component of the study across all JD and CP tennis coaches in Australia.

Perhaps one of this study's greatest assets may have also initially presented as its most obviously limiting feature. All the coaches in this study reported to having no prior knowledge of *The Spectrum* (Mosston & Ashworth, 2008). Subsequently, while some coaches might have declared the use of a Game-Based Approach (GBA), the coding process used in this study would not have recognised this by name as it is not formally listed on *The Spectrum* (Mosston & Ashworth, 2008). However, the implementation of *The Spectrum* (Mosston & Ashworth, 2008) to code the participants' teaching styles provided an impartial and unprejudiced conception of any teaching style. This was based on the notion of a *non-versus* approach that stipulates that no teaching style is inherently more or less effective than another (Mosston & Ashworth, 2008). Each teaching style "because of the unique learning conditions it fosters, is either more or less appropriate given the purposes, the context in which it is presented, or the learners involved" (Goldberger et al., 2012, p. 269). Those who are familiar with *The Spectrum* (Mosston & Ashworth, 2008) have the capacity to observe:

> Any teaching-learning encounter and, with a good degree of accuracy and reliability, agree on which decisions were made by the teacher and learner, and which decisions were not made by anyone, and thus can identify the approximate position of this particular teaching-learning encounter along the decision making continuum. (Goldberger et al., 2012, p. 269)

Statements such as *in my opinion* are essentially not necessary when discussing *The Spectrum* (Mosston & Ashworth, 2008). It does not cast judgement about any form of teaching or coaching behaviour but rather "identifies its position along this decision making continuum within the elements of an instructional context" (Mosston & Ashworth, 2008, p. 269). Therefore, while it is acknowledged that *The Spectrum* (Mosston & Ashworth, 2008) does not identify a teaching style called GBA, it does have the capacity to recognise and identify any coaching and learning behaviour. This notion is based on *The Spectrum's* (Mosston & Ashworth, 2008) premise that all coaching behaviour is about decision making. This analysis would typically involve identifying the decisions made by the coach and the learner in all three decision sets (*pre-impact*, *impact*, and *post-impact*). The interviews confirmed that the coaches employed a number of terms to describe their coaching behaviour and instructional practices. This reinforces that many of the teaching styles that were observed may be defined by alternative names. The central axiom of *The Spectrum* (Mosston & Ashworth, 2008) – decision making – however, provided the researcher with assistance and guidance from Prof. Sara Ashworth to code these behaviours. This was achieved not by the term that the coaches assigned, but rather by the decisions that the coach and the students exhibited during all three decision sets (*pre-impact*, *impact*, and *post-impact*). This notion provides further evidence of the ability of *The Spectrum* (Mosston & Ashworth, 2008) to identify various forms of coaching behaviour irrespective of how these behaviours are defined or labelled.

For almost 50 years, *The Spectrum* (Mosston & Ashworth, 2008) has endured as a renowned theoretical framework about teaching, coaching and research in Physical Education worldwide (Goldberger et al., 2012). It continues to present as a practical framework for the provision of instruction in Physical Education and sport (Harrison, Blakemore, & Buck, 2007; Mohnsen, 2010; Pangrazi & Beighle, 2010; Siedentop & Tannehill, 2000). *The Spectrum* (Mosston & Ashworth, 2008) has also been widely employed for stimulating student learning (Graham, Holt/Hale, & Parker, 2010; Metzler, 2011; Rink, 2010; Tjeerdsma Blankenship, 2008). The unparalleled expertise and knowledge of Prof. Sara Ashworth with regard to *The Spectrum* (Mosston & Ashworth, 2008) was frequently provided throughout the entirety of the study and in particular during the coding of the coaches' observed coaching sessions. Therefore, it could be confidently affirmed that the conceptual framework of which this study is founded is markedly sound. The potential flexibility and scope of *The Spectrum* (Mosston & Ashworth, 2008) are further realised with the notion of canopy design teaching styles. According to Prof. Sara Ashworth, "the idea of the canopy is the new world where creative teaching stems. Deliberately designing different episodes to engage specific learning opportunities is a wonderful new world that education has not even begun to enter. (S. Ashworth, personal communication, June 18, 2011)

6.4 Recommendations

6.4.1 The context

The recommendations presented have been formulated with a particular emphasis on the educational curricula and the formal accreditation coaching courses provided by Tennis Australia (TA). However, the potential for this study to influence and impact on other sports coaching and teaching disciplines is evident. As some of the findings from this study have been published in a number of editions of the International Tennis Federation (ITF) *Sports Science Review* (Hewitt & Edwards, 2011, 2013) the resultant outcomes are of relevance to tennis coach education providers outside Australia. Consequently, the outlined recommendations have the potential to be considered as providing useful and contemporary pedagogical information among a wide variety of coach and teacher education providers and associated sport and Physical Education governing bodies more broadly. In consideration of the findings made during this research, this section provides recommendations aimed at addressing not only the research questions but also some of the factors potentially influencing the perceived and actual teaching styles employed by coaches and their associated beliefs concerning the implementation of teaching styles as identified in this research.

By undertaking a concerted professional dialogue, coaches need to be engaged in and challenged by the issues presented in this study. In view of the importance of these issues, coaches are ideally positioned to enact change to their instructional practices and associated insights about these practices. Coaches must be prepared to cater for the diversity of players' learning needs, interests, preferences and developmental readiness or stage of learning. As no one teaching style encompasses all learning eventualities, an effective coach must have the capability to change, combine and transition between various instructional practices during sessions. An extensive body of knowledge has compellingly indicated that coaches have a significant role to play in developing and enhancing the abilities of their players. This begins with the coaches' beliefs that their professional instructional practices can be modified and/or enhanced and that these enrichments will serve to boost players' development in various learning domains, abilities and enjoyment of the game of tennis. In order to accomplish these complex and demanding issues the recommendations are presented in light of the findings of this study and largely appeal to continuing professional development initiatives.

6.4.2 Summary of recommendations

Recommendation 1: Increase understanding and knowledge of a variety of teaching styles.
Recommendation 2: Enhance the awareness of tennis coaches' behaviour during coaching sessions.
Recommendation 3: Provide a clearer delineation of pedagogical terminology with regard to the teaching styles available for tennis coaches.
Recommendation 4: Provide professional development opportunities for the mentors of course participants

6.4.3 Recommendation 1: Increase understanding and knowledge of a variety of teaching styles

It is recommended that tennis coaches acquire a greater understanding and knowledge of a variety of teaching styles. This proposal is strongly supported by the findings of this study. Despite all the coaches who participated in the observations self-reporting the use of all teaching styles from the *reproduction* and *production clusters* of *The Spectrum* (Mosston & Ashworth, 2008) at some point during their coaching sessions throughout the year, when the video-recorded sessions were coded, two landmark teaching styles from the *reproduction cluster* were observed. These results indicated a lack of congruence between the teaching styles that coaches believed that they employed and the teaching styles that they actually implemented. This suggests a lack of knowledge in relation to what constitutes teaching styles and the application of various teaching styles.

As indicated previously, a lack of knowledge regarding *The Spectrum* (Mosston & Ashworth, 2008) certainly influenced the instructional processes that were observed during **Stage 2** (observations) of this study. Therefore, increasing the understanding and knowledge of *The Spectrum* (Mosston & Ashworth, 2008) would positively impact on the coaches' performance. This would be particularly evident in their capacity to employ a variety of teaching styles, in addition to having the ability to implement particular teaching styles depending on various factors. These factors might include the player's individual characteristics and requirements as well as the specific objectives of the session.

According to Mosston and Ashworth (2008), the answer to positively influencing a more stable learning environment is to possess a more established understanding of teaching and coaching and the inherent learning outcomes that each alternative teaching style option proposes. Each teaching style alternative emphasises significantly different learning outcomes in content, cognitive engagement, social interaction, and emotional and ethical development. Primary questions include:

- "What is a teaching style?"
- "How is one behaviour distinguished from another?"
- "What is the criterion for selecting one behaviour rather than another?"
- "Is it really possible to implement different behaviours during tennis coaching sessions without confusing players?"
- "If each behaviour has its own expectations, rules and procedures, does coaching become more complicated?"

- "Is there really a difference in learning outcomes when alternative behaviours are implemented during tennis coaching sessions?"

In order to promote a better understanding of *The Spectrum* (Mosston & Ashworth, 2008) these are some of the questions with which professional development initiatives must engage coaches. In order for coaches to provide players with a quality learning experience they need to learn about different teaching styles and be prepared to provide a full range of teaching and learning options. According to Ashworth:

> Alternatives in coaching can be learned, just as learning can result from coaching. Appropriate selection of teaching styles is the true measure of good teaching and TS (teaching style) selection is influenced and directed by awareness of student needs, developmental intent, and content focus. It could be that Style-B is the best TS for all lessons because of the learning conditions and situation. (S. Ashworth, personal communication, September 12, 2012)

It must be acknowledged, however, that *The Spectrum* (Mosston & Ashworth, 2008) is a complex theoretical teaching framework that demands a comprehensive understanding to implement accurately and effectively the teaching styles and appreciate and apply the innovative concept of canopy designs. As described earlier, canopy designs highlight and share approximate, but not precise, learning objectives, decision structures and the developmental focus of the landmark teaching style(s) they are located near or in between. Subsequently, an initial exposure to certain theoretical notions that inform the practice of select teaching styles may provide the most effective avenue for educating practitioners who possess no prior knowledge of *The Spectrum* (Mosston & Ashworth, 2008). This might include providing demonstrations and showing videos, during coaching courses that show the use of a variety of teaching styles.

There are a number of specific professional development initiatives involving in-service opportunities as well as embedding new information and material in accreditation course manuals that could be employed to increase coaches' knowledge and understanding of a range of teaching styles. These specific initiatives have been outlined as sub-headings below and are discussed individually.

6.4.3.1 Video clips of a range of teaching styles

One initiative that may serve to increase the knowledge and understanding of coaches with regard to a variety of teaching styles is the production of video clips of various teaching styles. These clips would outline a range of teaching styles and show what they look like in a practical tennis coaching setting. This recommendation is based on findings that emanated from the interviews. For instance, David suggested:

> Having some practical examples of different coaching styles and methods to watch instead of reading in a book about how it works or reading from a PowerPoint presentation would be good. To see how it actually works, what it looks like and how the coach communicates and sets up the different

> coaching ways would be very helpful, it's pretty hard to do it from just reading from a book. (David, JD coach interviewee, July 12, 2011)

David's views pertaining to presenting various teaching styles in video format for coaches to observe is reinforced by Andrea's reflections:

> I think the course needs video footage of different approaches and how they actually operate and work on the court. I think I need to see real life examples, actual activities and how the coach and the player interact. In books and on a white board presentation it loses its real meaning and practical perspective. I want to see videos of examples. There are heaps of ways to describe what we do and reading about them or someone just telling you about them is too confusing I reckon. (Andrea, CP coach interviewee, July 15, 2011)

The provision of visual examples provides the added benefit of catering for learners who prefer to learn via visual mediums. Preferences for learning in this manner were evident in the interviews. Common responses among a large majority of the respondents indicated their desire for educational material, particularly those related to teaching styles, to be exhibited in more visual forms. An example of was seen in a comment made by one of the interviewees:

> I prefer to see things happen than read about it, or being told about it. I like to watch it happen. Show it to me and give me visual explanations and demonstrations and I'll probably get it, understand it better than someone telling me really. (Diana, CP coach interviewee, July 16, 2011)

A sound understanding of the theoretical aspects related to *The Spectrum* (Mosston & Ashworth, 2008) is of significant value as coaches plan and deliver meaningful and purposeful coaching sessions designed to enhance the abilities of their players. In an attempt to generate added understanding and discernment of the various teaching style options available to tennis coaches, the development of video footage that offers visual examples of teaching styles is recommended. Currently, *The Spectrum* website (http://www.spectrumofteachingstyles.org/) includes an array of video clips designed to provide a general outline of the 11 landmark teaching styles. There also exist various video clips on YouTube that highlight different Physical Education and sporting activities being instructed using a number of the landmark styles on *The Spectrum* (Mosston & Ashworth, 2008). It is recommended that coach education providers at Tennis Australia (TA) develop a series of video clips designed specifically for tennis coaches. If *The Spectrum* (Mosston & Ashworth, 2008) is to be accepted as the medium for coaching tennis using its identified teaching styles then these clips would demonstrate how teaching styles on *The Spectrum* could be employed during tennis coaching sessions. Through a greater understanding of a variety of teaching styles, coaches would be better equipped to cater for the range of learning aims and objectives required to coach tennis.

6.4.3.2 A better understanding of the learning theories that underpin teaching styles

Another initiative that may serve to increase coaches' knowledge and understanding of a variety of teaching styles and improve their coaching performance is a better grasp of the learning theories that underpin the employment of teaching styles. The findings from the interviews established that despite the coaches' limited awareness of the instructional practices that they perform during coaching sessions, they did display an ability to articulate the type of environment that they wished to produce and the behaviours that they wanted to encourage. For instance, the following comment was representative of all the interviewees: "It is important that the kids learn themselves and the coach plays more of a guiding role" (Andrea, CP coach interviewee, July 15, 2011).

Despite not having the capacity to describe the benefits of their coaching behaviour, all the interviewees highlighted the importance of their players making decisions about learning during sessions. They also indicated that coaches should primarily ask questions as opposed to telling the players what to do and how to do it. These responses reveal a disparity between "espoused theory, that describes regulatory statements of intent regarding teaching, and theories-in-use, which is what the teacher actually does" (Argyris & Schon, 1974, p. 67). The findings in this study suggest that the coaches strongly believed that the players should be primarily responsible for their own learning. In spite of this, however, they were unable to perform these pedagogical principles during coaching sessions or to elaborate on the theoretical assumptions that supported these claims much less impart to the players the knowledge and appreciation of the value of the various teaching styles that underpin these objectives. This point was evident in a comment by Patrick who stated: "Having the players figure things out for themselves is the best way to coach … They just learn more" (Patrick, JD coach interviewee, July 23, 2011). Andrea expressed a similar point of view when she commented:

> You have to include them and ask questions. A more games based strategy or approach with lots of questions and discovery is definitely the best though … Let then work it out … Tennis is a game so getting them to figure it out for themselves will help them when they play on the weekend. (Andrea, CP coach interviewee, July 20, 2011)

Light (2008) has suggested that a catalyst for enhancing what coaches do necessitates that they are able to identify and understand the assumptions that inspire and inform their teaching styles. Light further indicates that it is crucial to possess an awareness of the suppositions about learning that underpin various teaching styles. A coach's decision to employ certain teaching styles and instructional practices should be informed and based on relevant theories of learning. Initiating any change process with regard to instructional practices requires the involvement of some understanding of the theories supporting it. Rink (2001) has further indicated that "You don't want to know simply that something works – you want to know why it works" (p. 23). Literature has also suggested that an awareness and knowledge of key pedagogical concepts about the theoretical assumptions that underpin various teaching styles will result in a more profound level of self-reflection with regard to *what* the coach is doing and *why* they are doing it. It will also assist coaches in developing a better

understanding of *how* players learn and the impact that their coaching behaviours may have on the learning of their students (Jones et al., 2008). Applying this knowledge utilising a clear session plan or outline of the specific learning objectives, and identifying the relevant teaching style to achieve these aims is paramount. Setting tasks during coaching sessions that specifically focus on selected teaching styles in the *production cluster* of *The Spectrum* (2008), is one avenue that may increase the coaches' theoretical and practical understanding of particular teaching styles (K. Edwards, personal communication, July 15, 2014).

While the coaches involved in the observation and interview stages of this study expressed a desire to implement teaching styles that are representative of a constructivist perspective, their practices were more representative of a behaviourist approach to learning. Constructivist orientations view the learner as an active participant in the learning process "who interacts with both a meaningful task and the learning environment to literally organize experiences and construct personal meaning" (Rink, 1999, p. 152). Constructivist theories emphasise "the nature of the content presented to the learner, the environment, and the role of the learner" (Rink, 1999, p. 152). This approach to learning adopts "a more ecological, holistic view of learning that challenges the dualistic division of the mind from body, learner from learned, and subject from object" (Light, 2008, p. 22). Components of constructivism are apparent in the teaching styles located in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008). In spite of the assumption that players may learn most effectively via constructivist conditions, it is crucial for coaches to acknowledge that effective coaching practices also "draws on many aspects of behaviourist and social learning theories" (Jones et al., 2008, p. 15). The claims regarding the value of employing teaching styles that are representative of constuctivist learning however, must be considered in light of various impacting variables. For example, these variables include: the objectives of the coach, the age of the player, the skill level of the player, the stage of learning of the player, the size of the group being coached, the motivation of the player in addition to the complexity of the skill being learned (Bailey & MacFadyen, 2007). Rink (2010) also cautioned about the "wholesale adoption of particular teaching methods" (p. 35).

According to Mosston and Ashworth (2008), in the absence of a "broad professional system and/or a reliable theoretical foundation" (Mosston & Ashworth, 2008, p. 3), teachers are at risk of approaching their instructional practices from an idiosyncratic perspective. As this viewpoint consists of personal interpretations and biases, it may serve to limit the educational practices of teachers and coaches (Mosston & Ashworth, 2008). Furthermore, these personal interpretations may lead to a lack of conceptual consensus, consistency of definitions or uniformity in relation to various pedagogical approaches. In the absence of definitional consistency concerning terminology:

> Reliable communication, accurate implementation, and assessment of ideas are difficult, if not impossible … Imprecise terminology allows teachers, supervisors, and researchers to interpret events differently. They then make assumptions about what they do in the classroom or make research conclusions that are unreliable and at times inaccurate. (Mosston & Ashworth, 2008, p. 3)

Therefore, coach education providers must strive to offer coaches professional development initiatives that include a fundamental outline of theories of learning and their associated benefits and limitations within a practical setting. The ultimate outcome of these initiatives "enables a clearer match between coach behaviour, practice, and context, as well as the athlete's development and specific needs" (Cushion, 2010, p. 5).

6.4.3.3 There is no *best* teaching style

The results of the findings indicate that tennis coaches believe that some teaching styles are better than others are for developing tennis players. It is recommended, therefore, that coaches require knowledge about the benefits of having the capacity to employ a variety of teaching styles. Despite the fact that all the coaches were observed employing teaching styles in the *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) they all attested to the superiority of teaching styles that share similar pedagogical guidelines with teaching styles in the *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008). These teaching styles include the students in decision making to stimulate discovery and creativity of knowledge and skills (Mosston & Ashworth, 2008). Below are two specific examples that encapsulated the general opinions expressed by all the interviewees Andrea stated that:

> A more games based strategy or approach with lots of questions and discovery is definitely the best though … Let them work it out … tennis is a game so getting them to figure it out for themselves will help them when they play on the weekend. (Andrea, CP coach interviewee, July 14, 2011)

Patrick provided a further example of this viewpoint:

> I still reckon asking questions and the games based approach and discovery is the best way to teach tennis … Let the students play games and rally and guide them to figure the skills and tactics out for themselves. (Patrick, JD coach interviewee, July 22, 2011)

There is a growing view of the value of instructional guidelines that foster increased student decision making in order to support discovery and creativity of knowledge (Farrow, Baker & McMahon, 2008; Renshaw, Chow, Davids & Hammond, 2010; Williams & Hodges, 2005). A major assumption of indirect instruction "encourages learners to engage in self-discovery that could lead to greater psychological engagement in sport and physical activity" (Renshaw et al., 2010, p. 134). Interestingly, Rink (2010) has claimed that students will be engaged actively and creatively in a way that will lead to a more effective movement response that is adaptable and transferable to the sporting context.

These learning assumptions in relation to discovery and inquiry instructional practices have prompted tennis coach education providers to promote indirect teaching styles that embrace a greater degree of meaningful learning and increased student involvement in the learning process (Crespo & Reid, 2009; Tennis Australia, 2010). This has perhaps created a *versus* mentality among tennis practitioners in

Australia with regard to the value of different forms of coaching behaviour. According to Mosston and Ashworth (2008), a *versus approach* to education is when ideas are "presented in opposition to the status quo" (p. 2). Since a *versus* perspective to various pedagogical principles fundamentally "rejects ideas, it limits educational practices" (Mosston & Ashworth, 2008, p. 2). Initiating change, in this case, might consist of introducing coaches to the idea that there is a range of teaching styles, drawing on *The Spectrum* (Mosston & Ashworth, 2008). The conception that there exist many different teaching styles that may be used is a useful starting point in encouraging coaches to think critically about the conceptions of learning and coaching. Rather than attempting to educate coaches about all the teaching styles on *The Spectrum* (Mosston & Ashworth, 2008), it may be initially more realistic to inform coaches of a select range of teaching styles from the *reproduction* and *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008).

6.4.3.4 Cater to the needs of all players

All of the interviewees specified that they used the same *way* of coaching in all of their observed coaching sessions regardless of the age level or ability of their players. Furthermore, nearly all the coaches stated that they did not believe that they should be required to change the *way* that they coach. In response to these particular findings it is recommended that coaches receive professional development in employing teaching styles to suit the individual needs and developmental readiness of each player. It has been suggested that "there is no single theory of learning that would explain learning or lack of it in all situations, and, therefore, there can be no single approach to instruction" (Rink, 2001, p. 123). Each theory of learning supports a particular approach to instruction, and consequently, each has "but a piece of a very complex phenomenon we call learning" (Rink, 2001, p. 123). To impact on the learning experiences of players effectively, coaches are required to customise their instruction to the "specific learning readiness and interests of their students, by integrating concepts and implementing teaching strategies that are responsive to the students' diverse needs" (Whipp, Taggart, & Taggart, 2012, p. 1). With regard to Physical Education, Graham (1995) posited that while instruction would be simpler if all the students possessed matching interests, capabilities, and experiences, a 'one program fits all' perspective fails to acknowledge the notion of differentiation. The concept of differentiation fosters the promotion of instructional content and behaviour specifically designed to cater to the individual needs and requirements of students (Graham, 1985; Tomlinson, 1985, 1999).

As no one teaching style encompasses all learning eventualities, an effective coach must have the capability to change, combine and transition between various teaching styles during sessions. A common principle in the discipline of coaching is that coaches should base their teaching style(s) on a number of considerations. These include the developmental characteristics and individual requirements of the player, as well as the subject matter intent (Rukavina & Foxworth, 2009). As diverse learning conditions and experiences are often created by employing different teaching styles, the necessity for coaches to understand and to implement purposefully a range of teaching styles to achieve various learning outcomes is paramount. As previously indicated, the requirement for a tennis coach to employ a range of teaching styles is perhaps reliant on a number of considerations. To begin with, coaches must be prepared to cater for the diversity of the player's learning

needs, interests, preferences and developmental readiness or stage of learning. Moreover, tennis involves learning aims and objectives from the psychomotor (physical/motor skill), cognitive (decision making) and affective (enjoyment/motivation) learning domains. Likewise, the content of the session and the context (such as age and ability) in which subject matter is presented must be considered. As motor skill instruction appeals to a progressive, step-by-step and explicit orientation, there exists substantial support for the teaching of motor skills using direct instruction. However, there is agreement with the view that restricting the teaching and learning of sport and Physical Education to learning how to perform a motor skill not only limits our "contributions but may have a negative effect on the manner in which students are able to use those motor responses in meaningful activity" (Rink, as cited in Hardy & Mawer, 1999, p. 164). Therefore, designing instructional practices that provide players with the ability to execute motor skills in meaningful and contextual activities and settings would appear to be the challenge for Physical Education teachers and sports coaches. This is a challenge that, as Rink (1999) advocates "is likely to involve the need for a variety of instructional processes" (p. 164).

Despite this recommendation, all the coaches in the present study commented that their choice and employment of a particular teaching style did not alter as a function of the age or ability of the players whom they coached. Each of the coaches specified that they used the same *way* of coaching in all their observed coaching sessions irrespective of the age level or ability of their players. Implementing the same teaching style regardless of various factors may be plausible if it is employed with the appropriate level of understanding and complexity. The coaches in this study, however, demonstrated a lack of understanding and knowledge in relation to various teaching styles. It was also evident that the coaches believed that certain *ways* of coaching were more effective than others. All the interviewees suggested that a Game-Based Approach (GBA) was the *best* way to teach tennis to junior players. Yet, their inaccurate understanding and application of this particular *way* of coaching may be doing more harm to the learning outcomes and perhaps the enjoyment of the session compared to the implementation of a limited, but well executed, number of teaching styles which consider the age and ability of players. The notion that certain *ways* of coaching may be more beneficial than others was evident in the responses provided by some of the interviewees. These select examples are representative of all the interviewee's views.

> I pretty much instruct the same way with everyone, or at least I try and do it this way … It's my style to let kids and adults for that matter discover the skills of what to do on their own. (Patrick, JD coach interviewee, July 12, 2011)

> Yep … I just modify my use of language and stuff … so the little ones can understand what I'm saying … my instructions … Sometimes with the older ones and better ones, but really I coach the same way, use the same approach, A Games-Based Approach … Still a lot of questions, and try and get the kids thinking on their own. (Chris, JD coach interviewee, July 12, 2011)

> I don't think coaches should have to change their style. The Game-Based Approach is just a better way to coach, so it can be done with all players, it doesn't really matter what the age of the player is, or the level really, you

> might have to ask easier questions to the younger kids, but, that's about it. All kinds of players find this a more fun way to learn. (Bill, JD coach interviewee, July 10, 2011)

These comments suggest that the coaches' decisions concerning the selection of instructional guidelines are not informed by the notion of differentiation. As discussed in **Chapter One**, differentiation stipulates the promotion of instructional behaviour and content specifically designed to cater to the individual needs and requirements of students (Graham, 1985; Tomlinson, 1985, 1999). Rather, the coaches' decisions are perhaps based on an idiosyncratic perspective that consists of personal interpretations, biases and what they perceive as the most effective avenue for players to learn tennis. According to Mosston and Ashworth (2008), this viewpoint may reduce the educational effectiveness of teachers and coaches. The motivation and interest of coaches in relation to learning new concepts as well as their willingness to change the way that they conduct coaching sessions, however, are factors to consider.

Nevertheless, this information affords coach education providers with a crucial understanding of what coaches are thinking and the motivations that underpin their decisions to select particular instructional guidelines for players during sessions. Therefore, professional development initiatives that focus on providing coaches with an awareness and understanding of differentiation would be advisable. Providing coaches with the ability to recognise the individual capabilities, interests, backgrounds and characteristics of individual students may assist them in selecting appropriate instructional guidelines to achieve effective coaching outcomes. According to Rink (2001):

> This kind of thinking changes the question that we ask from "Which is best?" and "What do I believe?" to "What is happening here, and for what purposes, under what conditions, and in what way should I use this instructional methodology?" There may not be a best way to teach, but there may be a best way to teach particular content to particular learners. (p. 124)

In order to design an optimal learning environment, coaches should be "less concerned about a coaching style or behaviour and more concerned about whether whatever they do impairs or facilitates learning" (Lyle & Cushion, 2010, p. 53). Coaches who possess the capacity to be receptive and flexible and can differentiate their teaching styles are ideally positioned to augment learning outcomes for all their players (Cain, 1989). However, is has been contended that a deficiency exists in coach education with regard to providing coaches with an "opportunity to explore how their behaviour looks to athletes, how athletes perceive what they are learning, and how athletes learn content that is in some way foreign to them" (Lyle & Cushion, 2010, p. 53). It could well be the case that poorly understood and applied teaching styles are possibly more damaging than not attempting to use them at all.

This shortcoming in coach education initiatives fundamentally dismisses a central conception of the role and function of coaching (Jones, 2006). Therefore, an awareness of behaviour as well as the resultant consequences via self-reflection is a crucial skill (Smith & Smoll, 2007). Furthermore, Smith and Smoll (2007), suggest that regular intervals of self-reflection may serve to encourage coaches to become

increasingly aware of situational cues and the various individual needs of their players and therefore more flexible in their behaviour. This recommendation forms part of extending the knowledge of coaches about having the capacity – though not necessarily the need – to always employ a range of teaching styles.

6.4.4 Recommendation 2: Provide a clearer delineation of pedagogical terminology with regard to teaching styles

It is recommended that tennis coaching course learner guides include a clearer delineation of pedagogical terminology regarding teaching styles available for tennis coaches. Literature about tennis coaching has suggested that a clear delineation of various instructional practices available to coaches would afford coach education providers with a more effective and relevant foundation to deliver evidence-based pedagogical messages throughout their formal accreditation courses (Reid et al., 2007). The results from the interview data indicated agreement between participants that multiple teaching styles exist for coaching tennis. However, the interviews also revealed that the coaches' interpretations and definitions of these teaching styles lacked consistency and accuracy and were often used interchangeably. According to Mosston and Ashworth (2008), "perhaps the most pressing issue confronting theory and practice is the ambiguity of pedagogical terminology" (p. 209). To be valuable terminology must be uniform and consistent.

The interviews revealed variability and confusion with regard to the definitions and interpretations of terms used to describe various teaching styles. This strongly suggests that the coaches' knowledge concerning teaching styles lack a thorough understanding of the theoretical conceptions that underpin the various teaching styles. It is recognised that the coaches who participated in the observation and interview stages indicated an absence of knowledge about *The Spectrum* (Mosston & Ashworth, 2008). It is possible, however, that the coaches had a superficial understanding of the approaches they believe they use. Furthermore, these approaches are often an amalgam of various teaching styles. The teaching styles described by the coaches in the interviews suggest the general presence of similar and common conceptions with teaching styles in the *reproduction* and *production cluster* of *The Spectrum* (Mosston & Ashworth, 2008). As a consequence, it is recommended that TA develop a framework containing a clear delineation of pedagogical terminology and definitions with regard to teaching styles and tennis coaching. This initiative would commence with coach education providers at TA reviewing the current course manuals and ensuring that the terms and definitions employed in these resources are consistent. Once the manuals were developed, the course presenters (or Learning Facilitators) would require some professional development when delivering this information to course participants. In this case, *The Spectrum* (Mosston & Ashworth, 2008) could be used as a way of not only understanding a range of teaching styles but also as a mechanism for interpreting and implementing various so-called approaches and methods.

The development of a clearer pedagogical terminology may also be relevant for all those involved in sport and Health and Physical Education (HPE). This might include teachers, sports coaches and university lecturers. The concept that a universal framework of terms be developed and implemented across an array of disciplines, including tennis coaching, is unrealistic. However, presenting a compilation of terms

at conferences (e.g., ACHPER, tennis coaching conferences), in published articles and even literature reviews, detailed instructional processes as they relate to coaching and teaching (such as that presented in this thesis) may serve to promote a better understanding. This material could be supported by modelling, demonstrations and video clips.

6.4.5 Recommendation 3: Provide professional development opportunities for the course participants' mentors

It is recommended that professional development opportunities be afforded to the mentors of course participants. This suggestion is supported by the findings from **Stage 3** (interviews) of this study. All 13 coaches acknowledged the significant influence of a mentor on the *way* that they currently coach. Each of the participants who were interviewed identified the Head Coach at the tennis club where they work as this mentor. Consequently, it is recommended that coach education providers explore ways to engage positively and to collaborate more closely with these mentors. Encouraging these mentors to reinforce sound pedagogical coaching messages may further assist coaches in delivering effective coaching sessions.

Learning to teach or coach is an expansive and multifaceted discipline. It remains a disputed construct that is informed by a "range of theories drawn from three main approaches: behaviourism, cognitivism and social/constructivism" (Cushion, Nelson, Armour, Lyle, Jones, Sandford & O'Callaghan, 2010, p. 1). Consequently, there is no distinctive embodied theory of learning from which to construct coach development and education. Notwithstanding the presence of assumptions concerning learning and the embedded conceptions of how teachers and coaches learn, the approaches to coach education and learning principally remain "explicitly uninformed by learning theory" (Cushion et al., 2010, p. 1). It is suggested that learning is largely pursued within a collection of "ideas or experiences, or the result of the default view for a particular programme" (Cushion et al., 2010, p. 2). Coach learning is shaped by a diverse combination of "formal, non-formal, informal directed and self-directed learning experiences" (Cushion et al., 2010, p. ii). It is considered, however, that these avenues are mostly personalised and random. Considering that coaching accreditation is typically acquired only following the successful completion of a formal course it might be expected that this source of learning would serve as the most important. However, formal accreditation programs are only one of a number of methods that coaches consider important in learning to coach. Other than formal accreditation programs, learning experiences that stem from playing experience, mentoring, discussions with other coaches and observation all play a substantial function in learning to coach. It is acknowledged that altering or modifying coaching behaviour, especially if the individual coach follows similar instructional processes to when they were coached, is a challenging initiative. However, given the lack of knowledge and understanding in relation to the application of various teaching styles, it would seem paramount that some form of education be instituted in this area.

In spite of the fact that coaching accreditation is commonly achieved only following the completion of a formal course, no coaches in this study mentioned the impact or influence of the formal accreditation coaching course that they were currently completing. It is possible, however, that it may have been too early in the

course for the participants to judge its impact. There might also be a perception that the courses are a requirement but not particularly useful or relevant to their everyday work experience. In addition, some of the coaches may have mentioned the influence of the course on their coaching behaviour if asked directly or prompted. Nonetheless, this information presents important ramifications for continuing professional development initiatives.

6.4.6 Recommendation 4: Enhance the awareness of tennis coaches' behaviour during coaching sessions

All the coaches who were observed as part of **Stage 2** of the study indicated and acknowledged an apparent lack of compatibility with regard to what they believed happened and what actually transpired during their coaching sessions. As a result of this finding, it is recommended that coaches become more aware of their coaching behaviour during coaching sessions. According to Lyle and Cushion (2010) "coaches are notoriously poor at describing their own behaviour" (Lyle & Cushion, p. 44). Similarly, Mosston and Ashworth (2008) state the gap between what we say we want to do and what we are doing in practice has been and still is the main problem in Physical Education, as it is with many branches of education. This claim is further supported by this research and that of others (Hewitt & Edwards, 2011, 2013; SueSee, 2012). Research has established that sports coaches have a restricted capacity of awareness in relation to their behaviours, and that players' ratings associate more persuasively with observed behaviours than the coaches' own self-ratings (Smoll & Smith, 2006). Consequently, highlighting the actions employed by coaches in practice and competition settings can contribute to elevating the awareness of coaches of what they are actually doing. Lyle and Cushion (2010) contend that "the most sophisticated understandings of coaching practice and advances in coach education would seem fruitless if coaches seemingly lack basic levels of self-awareness" (p. 44). Likewise, Launder (2001) maintains that "coaches' behaviour is often intuitive – in other words their knowing is in their actions, they cannot always conceptualise or verbalise what they do, even if they do it superbly" (p. 45). Therefore, it is argued that if their level of knowing remains situated in action, coaches may be incapable of producing a coherent and rational account of the reasons why they behave as they do. As a result, coaches may not realise the potential limitations associated with their coaching behaviour.

In order to generate a greater level of awareness among coaches with regard to their teaching styles, it is recommended that coaches develop the capacity to reflect on their coaching behaviour (Cassidy et al., 2009). Reflection is a term that has various definitions and interpretations (Cassidy et al., 2009). According to Dewey (1966), those who adopt a reflective pose investigate the assumptions that inform their behaviour and accept responsibility for their actions. Furthermore, Dewey (1916) suggested that before an individual can engage in reflective thinking, three personal attributes need to be present: "open-mindedness, wholeheartedness and responsibility' (p. 224). These are defined as follows:

- Open-mindedness is an active desire to listen to more sides than one; to give heed to facts from whatever source they come; to give full attention

to alternative possibilities; to recognise the possibility of error even in the beliefs that are dearest to us.

- Wholeheartedness, as the name suggests, refers to being 'absorbed' and/or 'thoroughly interested' in a particular subject.
- Responsibility refers to when the consequences of actions are not only considered but also accepted, thereby securing integrity in one's beliefs. (p. 224)

The interest in the term reflection can be largely attributed to Schön (1983). While Dewey's conception of reflection mainly focused on "outside the action and on future action rather than current action" (Eraut, 1995, p. 9), Schön's (1983) interpretation of reflection takes practice into account. In examining the notions associated with reflection, Schön introduces the concept of *reflection-in-action*, which refers to what "professionals and lay people alike do in practice, namely thinking about what they are doing, even while doing it"(p. 50).

By reflecting on practice, a coach may expose their perceptions and beliefs to evaluation, creating a heightened sense of self-awareness, which in turn may result to a "certain openness to ideas" (Hellison & Templin, 1991, p. 9). In recent times, the focus on reflection, or becoming a reflective practitioner, has gained popularity in a wide range of contexts (AITSL, 2011). Increasingly, practitioners are being persuaded to "stand back and reflect upon the construction and application of their professional knowledge" (Hardy & Mawer, 1999, p. 2).

All the coaches remarked on the beneficial outcomes associated with viewing their coaching sessions. The coaches expressed strong agreement that the video-recorded footage provided a useful platform to review their performance and assist in developing their understanding of the coaching process. For instance, David suggested:

> Yeah, I managed to take a look at the videos on Wednesday night, it was quite good, good to look at yourself coach and see what is happening, actually happening on the court. It would be good to have a copy of the DVD when you speak with the learning facilitator, instead of them just telling you about the lesson and talking you through what happened, the video lets you see it for yourself. (David, CP coach interviewee, July 15, 2011)

These comments serve to highlight the importance of employing strategies during coach accreditation courses that provide coaches with an opportunity to reflect on their coaching practices. In light of recommendations offered by Tsangaridou and O'Sullivan (1997) continuing professional development requires a dedicated focus on coaches' lived professional experiences and the provision of opportunities that serve to develop, refine, and extend coaches' abilities to self-reflect in relevant areas. Cushion and colleagues assert that through reflection, coaches become conscious of their behaviours and develop a rationale behind these actions (Cushion et al., 2003). However, in constructing and providing professional development initiatives that highlight the notion of reflection, coach education providers must acknowledge that "time and space is required within a learning program to develop reflective skills, otherwise these are likely to be superficial and uncritical" (Cushion, Nelson, Armour, Lyle, Jones, Sandford & O'Callaghan, 2010, p. 57). The ultimate objective in

implementing strategies designed to improve coaches' awareness is to enhance understanding of their behaviour and to activate questions and discussion as to what they are doing and why they are doing it (Jones, 2007). Achieving these outcomes will not only improve the coaches' performance but also serve to augment the development of their players.

In order to maximise the effectiveness of professional development within the discipline of education, it has been suggested that certain guiding principles be employed (Gulamhussein, 2013). The length of professional development must be significant and continuous to permit a sufficient amount of time for practitioners to grasp a novel strategy or teaching method as well as to contend with the application of the problem (Gulamhussein, 2013). Subsequently, it is advised that the professional development initiatives outlined for tennis coaches are of adequate duration and are ongoing. During the implementation stage of professional development, it is also considered essential that a satisfactory level of support is provided that suitably caters for the specific challenges encountered. According to Gulamhussein (2013), "simply increasing the amount of time spent in professional development is not enough … support at this stage helps teachers navigate the frustration that comes from using a new instructional method" (p. 15).

Many unsuccessful professional development programs involve participants as passive listeners rather than active participants (Gulamhussein, 2013). It is recommended that practitioners actively participate in understanding a new teaching method or form of instruction via activities such as: role plays, open-ended discussion and team-teaching (Gulamhsussein, 2013). While numerous forms of active learning assist practitioners to interpret pedagogical theories and practices, the concept of "modelling – when an expert demonstrates the new practice – has been shown to be particularly successful in helping teachers to understand and apply a concept and remain open to adopting it" (Gulamhussein, 2013, p. 17). Having mentor coaches, for instance, model certain coaching methods and practices while being observed by a novice coach who is learning the skill may serve as a highly relevant activity in the professional development of tennis coaches in Australia. In this way, novice coaches can view how particular coaching behaviour is being successfully implemented in a session consisting of actual players.

For professional development to be relevant, it is also advised that the content presented be specific. In the case of tennis coaches, this might consist of information pertaining to stroke technique for novice players as opposed to advanced tennis players. While there might be various generic concepts that apply to all coaches, these are ultimately "best understood and mediated with attention to how those general principles manifest within the context a teacher teaches" (Gulamhussein, 2013, p. 17).

6.5 Recent developments

With regard to curriculum reform and change, Macdonald (2003) associated innovation and improvement with a stone striking the roof of a henhouse – to wit, it results in a loud noise, excitement and anticipation that initially disturb the chickens, only to see things return to the status quo. That is to say – nothing actually changes. Educational reform does not simply transpire from valuable ideas that engender significance and fervour among practitioners, but with none or minimal action (Kirk, 2011). Rather, it involves taking these ideas beyond the preliminary stage of excitement and interest to embedding them into the practices of coaches and teachers.

The findings from this study are relevant to TA and tennis coaching internationally in their continuing quest to deliver quality coach education programs to engage and educate coaches to develop talented athletes nationally. In 2014, TA developed new coach education accreditation manuals for all their formal coach accreditation programs. These manuals included Trainee, JD, CP and HP (Tennis Australia, 2014). These learner guides now serve as the major resource for coaches during their formal accreditation courses. A major addition to these learner guides has been the inclusion of a Tennis Australia Coaching Methodology (TACM). The TACM was adopted in all of TA's 2014 accreditation manuals to provide coaches with a clear and defined pathway to plan, conduct and reflect on their coaching sessions. This initiative was in response to the findings from the interviews conducted as part of this study. These results revealed a number of potentially limiting features in maximising the development and effectiveness of tennis coaches in Australia. These comprised:

- Coaches used an assortment of terms to identify their teaching styles.
- The terms that the coaches employed to describe these styles were used interchangeably.
- Coaches lacked an ability to describe accurately their teaching styles during their three observed coaching sessions and therefore lacked self-awareness of their coaching behaviours.
- The coaches possessed limited knowledge of the reasons why these teaching styles might be of benefit to players.
- The teaching styles that coaches selected did not alter as a function of the age group or skill level or ability of the players whom they were coaching.

The TACM outlines a clearly defined and common set of terms that describe various pedagogical behaviours common to tennis coaches. This common framework of terminology was designed for coaches to employ a shared discourse when describing, defining and interpreting their coaching behaviours. In addition to this common definitional framework, video clips are being produced to provide visual representations and examples of various pedagogical behaviours common to tennis coaches. The video clips are based on some of the scenario descriptions of the 11 *Landmark Teaching Styles* on *The Spectrum* (Mosston & Ashworth, 2008) that were included in the survey questionnaire. These scenario descriptions provide a practical example of a coaching episode. The TACM also expanded the current provision of information concerning learning theories that underpin various pedagogical behaviours as well as the potential benefits and limitations that are associated with

each. This initiative provided coaches with a more informed pedagogical foundation on which to make decisions about their coaching behaviours. The TACM will be the subject of further research and refinement in the future.

Highlighting the importance for coaches to consider the concept of differentiation and catering to the individual needs of each student formed another key feature of the TACM. This area was deemed a crucial addition to the formal accreditation courses owing to all the coaches in the study indicating that their employment of teaching styles did not differ as a function of the age or ability of their students. Literature has suggested that effective coaches have the ability to: "tailor their content and instruction to the specific learning readiness and interests of their students, by integrating concepts and implementing teaching strategies that are responsive to the students' diverse needs" (Whipp et al., 2012, p. 12).

Within this process, it is pertinent to note that "coaches should not necessarily follow a plan or style either rigidly or blindly without consideration of what is happening in front of them" (Whipp et al., 2012, p. 52). As outlined in the TACM, one of the first decisions that coaches must formulate is *who* they are coaching and *what* their individual requirements are. Only after assessing these crucial questions, are the coaches directed to consider additional components of the session.

The reported incongruence between the teaching styles that the coaches believed that they employed and styles that they actually performed provided TA with an incentive to elucidate various teaching styles for coaches to employ during their coaching sessions. In this case, a major objective was increasing the awareness of tennis coaches about their pedagogical practices. Providing coaches with an outline of teaching styles in the *production* and *reproduction cluster* of *The Spectrum* (Mosston & Ashworth, 2008) was designed to illustrate the availability of a variety of teaching styles that coaches can employ. It also served to outline the key pedagogical principles associated with each teaching style and the possibilities that they present for developing tennis players. Opportunities via group problem-based learning activities and practical case study scenarios were provided in all coaching courses to generate discussion and reflection and to encourage awareness and understanding of various teaching styles. As diverse learning conditions and experiences are created by employing different teaching styles, the necessity for coaches to understand and purposefully implement a range of teaching styles to achieve various learning aims and objectives is vital. The requirement for a tennis coach to possess the capacity to employ a range of teaching styles when appropriate is perhaps reliant on a number of considerations. Coaches must be prepared to cater for the diversity of players' learning needs, interests, preferences and developmental readiness or stage of learning. Additionally, tennis involves learning aims and objectives from the psychomotor (physical/motor skill), cognitive (decision making) and affective (enjoyment/motivation) domains. This might suggest the application of specific teaching styles to develop each learning area. As no one teaching style encompasses all learning eventualities, an effective coach must have the capability to change, combine and transition between a range of appropriate teaching styles during sessions.

In a further response to the apparent lack of awareness among the coaches in relation to the employment of teaching styles during coaching sessions an additional

initiative relating to assessment processes has been implemented during courses. The findings emanating from **Stage 1** (survey questionnaires) and **Stage 2** (observations) of the study suggest that coaches possess limited awareness of their perceived and actual coaching behaviour. The results from the interviews served only to support this view. Prior to the interviews, all the coaches were requested to watch all of their video-recorded coaching sessions. These video-recorded sessions were provided to them on a DVD by the researcher prior to the interview. At the commencement of the interview the researcher asked the respondents to comment on what occurred during the three observations with regard to their coaching behaviour. All the coaches who participated in **Stage 2** of the study expressed a high degree of surprise and disbelief as to what had transpired during these coaching sessions. Each coach indicated and acknowledged an apparent lack of compatibility to what they believed had happened during the sessions and what had actually ensued with regard to the teaching styles they had employed. All the coaches remarked on the beneficial outcomes associated with watching the video-recording of their coaching sessions. The coaches conveyed strong agreement that the videos provided a useful platform to review their performance and assist in developing their understanding of the coaching process. In order for the interviewees to provide such candid responses it was crucial that the interviewer provided a non-threatening, informal and supportive environment for the conversation that was largely led by the coaches. The quotation below from one of the JD coaches, which has been previously outlined, was representative of all interview respondents. Chris commented:

> I've never watched myself before, so it was really good to see what I do and how I coach, I thought that I might have used a more Game-Based Approach, but I did a lot of talking, I didn't shut up actually!, One of the comments from my learning facilitator was that I spent too much time explaining things and the kids didn't get to hit enough balls. At the time I didn't really agree with her, but after watching the lesson, I can see that I spent way too much time talking. (Chris, JD coach interviewee, July 12, 2011)

Consequently, all the coaches' on-court assessment sessions during formal coach accreditation courses are now video-recorded. These video-recordings are used by the course facilitators to assist coaches to reflect on their use of various teaching styles during coaching sessions. In an attempt to present this information in a *user-friendly* and accessible format to coaches, the Tennis Australia Coaching Methodology (TACM) was also summarised and presented in a checklist format for coaches to refer to during coaching sessions if they so desired.

Empirical research has revealed that effective coaches are capable of evaluating and rationalising their behaviours (Jones et al., 2004). It has also been suggested that good coaches "think about, and are aware of, their practice before, during and after the event, reflecting in some depth about plans, actions and consequences" (Cassidy et al., 2009, p. 5). If tennis coaches are to understand their behaviours and if they are to value the limitations and possibilities associated with these behaviours they must firstly know what they are doing. The recent developments outlined here demonstrate the utility of this study's research problems. The outcomes of this study have provided useful and contemporary pedagogical information that has been implemented in professional development initiatives to improve coaching performance.

6.6 Conclusion

Lyle and Cushion (2010) have described coaching research as neglecting to characterise satisfactorily the practice of coaching and as failing to impact on coach education. Coaches are often confronted with nebulous challenges and their practice is repeatedly exposed to elevated levels of variability and ambiguity. Sport pedagogy specialists have argued that the constrictions of practice may be specific to a particular context or common to all coaches, however, our current understanding of *what* they do and *why* they do it is largely limited (Saury & Durand, 1998; Mallett, 2005; Cushion, 2007; Lyle & Cushion, 2010). Therefore, research that considers "what coaches do and why they do it, still offers much in developing our understanding about coaching" (Cushion, 2010, p. 44). This study has contributed to the existing body of literature with regard to the instructional practices and insights of coaches in the discipline of tennis coaching as well as extending the theoretical conceptions of *The Spectrum* (Mosston & Ashworth, 2008). This was clearly evident in providing the first empirical research in connection with canopy designs. The identification of different features within pedagogical behaviour between tennis coaches in Australia is particularly crucial in the design of coach education programs and professional development initiatives. These findings present international implications and applicability especially in the context of tennis coaching and may provide relevance into sports coaching and pedagogy more broadly.

This study has presented the findings of research on the self-identified teaching styles of 208 JD and CP tennis coaches in Australia as well as the observed teaching styles of 12 tennis coaches from three 30 minute tennis sessions. As well as these observations, an additional coach participated in an extended observational period of 18 hours of coaching at their local tennis club. This study also explored the coaches' insights of teaching styles in addition to the motivations that informed their decisions to employ particular teaching styles during coaching sessions. Mosston and Ashworth's *Spectrum of Teaching Styles* (2008) was used as a basis for identifying the coaches' teaching styles. To the researcher's knowledge, this study has been the first published attempt to explore the practices and insights of tennis coaches. In doing so, it has provided necessary and valuable information and direction towards gaining a more comprehensive understanding of the behaviour of tennis coaches in Australia.

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APPENDICES

The following Appendices outline significant aspects related to the study.

Appendix A: Teaching styles survey questionnaire.

Appendix B: Identification of classroom teaching-learning styles instrument.

Appendix C: Instrument for identifying teaching styles (IFITS) coding sheet: Raw data for one of the participants.

Appendix D: Interview transcripts of two participants.

Appendix E: University of Southern Queensland ethics approval.

Appendix F: Tennis Australia approval letter.

Appendix G: Plain language statement and letter of invitation for coaches to participate in the study.

Appendix H: Consent form for the coaches participating in **Stage 2** (observations) and **Stage 3** (interviews) of the study.

Appendix I: Plain language statement and letter of invitation for parents and guardians of the players to participate in **Stage 2** (observations) of the study.

Appendix J: Consent form for the parents or guardians of the players participating in **Stage 2** (observation) of the study.

Appendix A: Teaching styles survey questionnaire.

A Survey of Teaching Styles used by Tennis Coaches

Mitchell Hewitt

TEACHING STYLES OF TENNIS COACHES QUESTIONNAIRE

A Teaching Style is a plan of action that defines the specific decision interaction of the teacher or coach and the learner for the purpose of leading to the development of specific objectives in subject matter and behaviour. One or more teaching styles may be used during a lesson/session.*

PART 1. BACKGROUND INFORMATION

INSTRUCTIONS:

- Please circle your response for the questions below. For example:

1. GENDER: (Male) Female

QUESTIONS:

1. GENDER: Male Female

2. AGE: 15-20 20-30 30-40 40-50 50+

3. STATE/TERRITORY WHERE YOU CURRENTLY COACH:

VIC NSW QLD SA

WA TAS ACT NT

4. HIGHEST EDUCATIONAL QUALIFICATION:

Secondary School Certificate or Diploma Trade/Apprenticeship

Undergraduate degree Postgraduate degree Masters Doctorate

5. COACHING QUALIFICATION THAT YOU ARE CURRENTLY COMPLETING:

Junior development Club professional

Master club professional High performance

6. YEARS OF COACHING: 0-3 4-10 11-20 20+

7. HOURS PER WEEK COACHING: 1-5 5-10 10-20 20-30 30-40 40+

INSTRUCTIONS:

- For questions 7 and 8 please indicate your response by placing the appropriate number in the box provided

8. AGE GROUP(S) MOST TIME SPENT COACHING PER WEEK:
(Please number in order from most to least e.g., 1, 2, 3 etc; if time is equal use the same number e.g. 1, 2, 2, 3, 4 etc; or not at all – use an X)

4-7		10-12		15-17	
7-10		12-15		17+	

9. LEVEL(S) MOST TIME SPENT COACHING PER WEEK:
(Please number in order from most to least e.g., 1, 2, 3 etc; if time is equal use the same number e.g. 1, 2, 2, 3 etc; or not at all – use an X)

Beginner		Intermediate	
Advanced		Elite Professionals	

PART 2. TEACHING STYLES

INSTRUCTIONS:

- Please read the **Scenario Description** for each **Teaching Style** and circle your response for each question.
- Please answer all questions from your coaching situations and respond as honestly as possible about only your teaching experiences.
- There are NO right or wrong responses. All teaching SCENARIO DESCRIPTIONS are valid. This questionnaire seeks your beliefs and opinions about which teaching styles you believe you use.

COMPLETED EXAMPLE:

Scenario Style	Scenario Description of Teaching Style				
1	The coach selects the task that the students perform in a unison, choreographed or precision performance image following the exact pacing and rhythm (cues) set by the coach.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	(4)	5

PLEASE COMPLETE THE FOLLOWING QUESTIONNAIRE:

Scenario Style	Scenario Description of Teaching Style				
1	The coach designs a single or series of problems, situations or questions that seek multiple solutions to the *same* problem. The task is new to the students; therefore, each student is invited to discover new possibilities, as they produce multiple responses to the specific problem. The coach acknowledges the production of multiple ideas, rather than any singular idea.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
2	The learner takes the role of both student and coach setting all learning objectives. The learner makes decisions about subject matter intent, design, execution, and assessment of the learning experiences. This style is independent of a coach and not initiated by a coach. Feedback from others occurs only IF the learner seeks it.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
3	The coach selects the task that the students perform in a unison, choreographed or precision performance image following the exact pacing and rhythm (cues) set by the coach.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
4	The coach asks one student a series of specific questions; each question has only one correct answer. The questions are sequenced in a logical pattern so that each answer leads the student step by step to discover the anticipated concept, principle, relationship or solution.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
5	The coach selects the subject matter tasks and presents the expectations for students to work with a partner. One student (the doer) practices the task, while the other student (the observer) uses coach prepared criteria (checklist) to offer immediate feedback about the performance to the doer. When the first set of tasks are finished, the students switch roles and continue to the second set of tasks. The coach interacts with the observer to affirm the use of the criteria and the accuracy of the feedback comments and/or to redirects the observer's focus to specific performance details on the criteria.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
6	A learner initiates a request to the coach to plan his/her own learning experience. In this experience the student makes all the decisions: selects the subject matter intent, designs, executes, and identifies the assessment criteria for the learning experience. The coach participates when and how the learner requests. The coach acknowledges the learner's successful implementation of the plans and initiates questions where discrepancies emerge between the learner's intent and actions. It is not the coach's job to evaluate, rather to act as a reference source between the indicated intent and action when asked by the student.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
7	The coach designs a situation or one question that has only one specific correct response—the situation or question is new and the response is not previously known to the students. The learners are given individual and private time to use their thinking and questioning skills to sequentially and logically discover the anticipated answer.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
8	The coach selects the subject matter tasks and designs multiple levels of difficulty for each task. Students select the level of difficulty that is appropriate to their performance. If inappropriate level decisions are made, the student may change the level choice. Students check their performance using the coach prepared performance checklist (criteria sheet). The coach circulates to acknowledge the choices the students have made and to ask questions for clarification to affirm the accuracy of the students' assessment process and/or to redirect the learner's focus to specific performance details on the criteria.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
9	The coach selects the subject matter tasks, the quantity, and the time limits so that students can practice individually and privately. The coach circulates among all students and offers private feedback. The students learn to set a pace to practice tasks within an allocated time frame.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
10	The coach selects the subject matter tasks and designs the criteria (performance checklist) for the students. Students individually practice the tasks and check their own performance using the checklist. The coach privately communicates with students to listen to their self-assessment comments and either reinforces the learner's use of the criteria or redirects the learner's focus to specific performance details on the criteria.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

Scenario Style	Scenario Description of Teaching Style				
11	The coach designates a broad subject matter/topic. Within that topic each student is responsible for producing an individual learning program that includes setting goals and the process for accomplishing the goals. The learners design, implement, refine the program, and create performance criteria for their individual learning programs. The coach acknowledges the production of ideas and asks questions for information or clarification about the learning program.				
How frequently do I use this teaching style in my coaching sessions throughout the year?	Not at all	Minimally	Here and there	Often	Most of the time
	1	2	3	4	5

This questionnaire is an adaptation by Hewitt, M., Edwards, K., Ashworth, S., & SueSee, B. (2010) of:

SueSee, B., Ashworth, S., & Edwards, K. (2006). Instrument for collecting teachers' beliefs about their teaching styles used in physical education: *Adaptation of description inventory of landmark teaching styles: A spectrum approach*. Unpublished dissertation, Queensland University of Technology, Brisbane, Australia. (Permission granted to adapt this inventory).

*Ashworth, S. (2009). *Teaching a Spectrum Repertoire*. Keynote presentation for 26th ACHPER International Conference. Brisbane, Australia, July.

Thank you!

Thank you for the time you have taken to complete the questionnaire. Perhaps you would like to take a break, before checking that you have answered all the questions.

Would you be interested in receiving a summary of the research findings?

NO

YES If yes, please provide a mailing address below.

If there are any comments you would like to make regarding this questionnaire, please use the space below.

Would you be willing to participate in STAGE 2 of this research project?

STAGE 2 of this research project consists of observing and recording coaching sessions in addition to conducting interviews.

Three of your practical tennis coaching sessions will be observed and recorded by the researcher. In addition, and as all comments, opinions and views in relation to your background and experiences in tennis and with teaching styles are highly valued I am planning to conduct an interview. This interview will be approximately 30 minutes in length (or longer if you wish to share additional insights and information). All recorded information as well as any information you share during the interview will be treated in the **strictest confidence.**

Please circle your willingness to be involved in STAGE 2 of the research project.

NO

YES If yes, please provide your name and a contact telephone number and/or email address below.

Thank you for your time and consideration.

Mitchell Hewitt
[mitch_hewitt@hotmail.com]

IDENTIFICATION OF CLASSROOM TEACHING-LEARNING STYLES

BASED ON THE SPECTRUM OF TEACHING STYLES FRAMEWORK

This tool is designed to determine which teaching style(s) are used in the classroom. This identification tool does not determine the *fidelity* or the *appropriateness* of the teaching-learning approach, but rather it identifies which of the Spectrum landmark teaching-learning styles the classroom behavior most resembles. This tool focuses on classroom **expectations** (stated and/or observed) in subject matter and learner behavior (the manner in which the learners are engaged in the task). During class time, more than one set of expectations is given; therefore, a series of *episodes* (a period of time in which the teacher and learners are in the same set of expectations) comprise each lesson. Consequently, the teaching-learning behavior in each *episode* within the lesson *must* be tallied, if an accurate analysis is to be made about which teaching-learning styles are used and which one(s) are used more frequently. Although there may be variations within the expectations, the teaching-learning styles used in the series of episodes throughout the lesson may resemble the same or different styles.

Directions: To identify the teaching-learning style, record the classroom action as it relates to both subject matter and learner behavior expectations. Record by placing a check or number, which represents the different episodes, in the blank spaces under each set of expectations. Each set of expectations can be placed into one of two clusters—reproduction (memory) teaching or production (discovery) teaching.

Listen to the verbal comments and/or observe the action to determine if the subject matter (the task) invites reproduction or production thinking. Then observe the manner in which the learners are participating in the task to identify the specific teaching-learning behavior in use.

I. Subject Matter Expectations – the content/task design

Reproduction-memory tasks. Four characteristics depict memory tasks. Any one / all characteristics indicate reproduction tasks.
Production-discovery tasks. Two characteristics depict two different types of discovery expectations. Each represents production tasks.

Learner Behavior Expectations – how are the learners asked to participate in the activity?
Reproduction. Five landmark *behavior descriptions* delineate different memory teaching-learning styles.
Production. Four landmark *behavior descriptions* delineate different discovery teaching-learning styles.

Reproduction - Subject Matter Expectations
Four characteristics depict memory tasks. Any one characteristic indicates a reproduction task.

Content is to be replicated as demonstrated (shown / explained) to the learners	The learner knows, has familiarity with, or is provided with the specifics of the task	"Correct" response(s) or a performance model exists in the subject matter task	Memory cognitive operations are used	Other: Learners could be passively (listening) or actively engaged in the task. Options with the prescribed task could be available

Reproduction - Learner Behavior Expectations

Five landmark ***behavior descriptions*** delineate different memory teaching-learning styles

Behavior 1: Precision Performance . Synchronized . On cue responses/ performance . Stimulus immediate response	**Behavior 2:** Individual practice, private feedback about performance from teacher **OR** Classroom experiences that seek "correct" responses: Factual question and answer lessons; Opinion or Review discussions; Lectures; Share Time activities, Guided Practice episodes, etc.) **OR** . "Listening" task *OR* . "Cooperative learning" or peer experiences where feedback is from peers who know how to do the task	**Behavior 3:** Partner practice with immediate feedback provided by a peer who uses teacher made criteria and with opportunity for switching practice and feedback roles (both learners must engage in both roles: performance practice and feedback practice using teacher prepared detailed criteria)	**Behavior 4:** Individual practice and engagement in self-assessment using teacher prepared detailed criteria	**Behavior 5:** Individual practice on a self-selected "difficulty level." All learners are engaged in the same task; however students choose their level of difficulty and Engagement in self-assessment using teacher prepared detailed criteria and opportunity to make another "level" selection if task is too difficult or not difficult enough
Behavior akin to the Command Style - A	Behavior akin to the Practice Style - B	Behavior akin to the Reciprocal Style - C	Behavior akin to the Self-Check Style - D	Behavior akin to the Inclusion Style – E

Production: Subject Matter Expectations

Two characteristics depict different types of discovery expectations.

Convergent Discovery Thinking One "correct" response exists in the subject matter; however, the delivery process shifts discovery of the concept to the learner There are two distinct convergent discovery behaviors	OR	**Divergent Discovery Thinking** Learners produce multiple-discovered responses within a particular question... (Specific "correct" responses are not anticipated.) Two divergent discovery behaviors are described	Other: Learners did not know the content before the experience. Subject matter is produced (discovered) by the learners Discovery cognitive operations are elicited Learners are active in the subject matter

Production: Behavior Expectations

Four landmark *behavior descriptions* delineate different discovery teaching-learning styles.

Behavior 6: Guided Convergent Discovery Learners engage in a series of logically sequenced questions that lead to the discovery of **ONE** "correct/anticipated" response (The "correct/ anticipated" response can be a concept, principal, rule, or relationship. The "correct/ anticipated" response cannot be a date, a name, a vocabulary word or a remembered fact. If the learner knows the target BEFORE the questions, the experience is not discovery rather behavior 2.) Although this teaching-learning behavior is possible with the whole class, it is most desirable with one student	**Behavior 7: Convergent Discovery** Learners are presented one question (that has one "correct/anticipated" answer) that requires logical, connected, discovery "thinking." No additional questions from the teacher or peers are given. Discover	**Behavior 8: Divergent Discovery** Learners are presented one question or a series of questions that result in the production (discovery) of multiple responses that were previous unknown to the learner	**Behavior 9: Individual Program Divergent Discovery** Learners are presented a problem/situation/ or condition (that is unknown/new to them) and they must design a program that presents discovered solutions to the stated situation
Behavior akin to the Guided Discovery Style - F	Behavior akin to the Convergent Discovery Style - G	Behavior akin to the Divergent Discovery Style - H	Behavior akin to Individual Program Learner Design Style - I

Appendix C: Instrument for Identifying Teaching Styles (IFITS) coding sheet: Raw data from one of the participants.

IFITS CODING SHEET

REPRODUCTIVE STYLES	PRODUCTIVE STYLES
A- Command	F- Guided Discovery
B- Practice	G- Convergent Discovery
C- Reciprocal	H- Divergent Discovery
D- Self-check	I- Individual Program
E- Inclusion	J- Learner Initiated
	K- Self-teaching

M-Class management

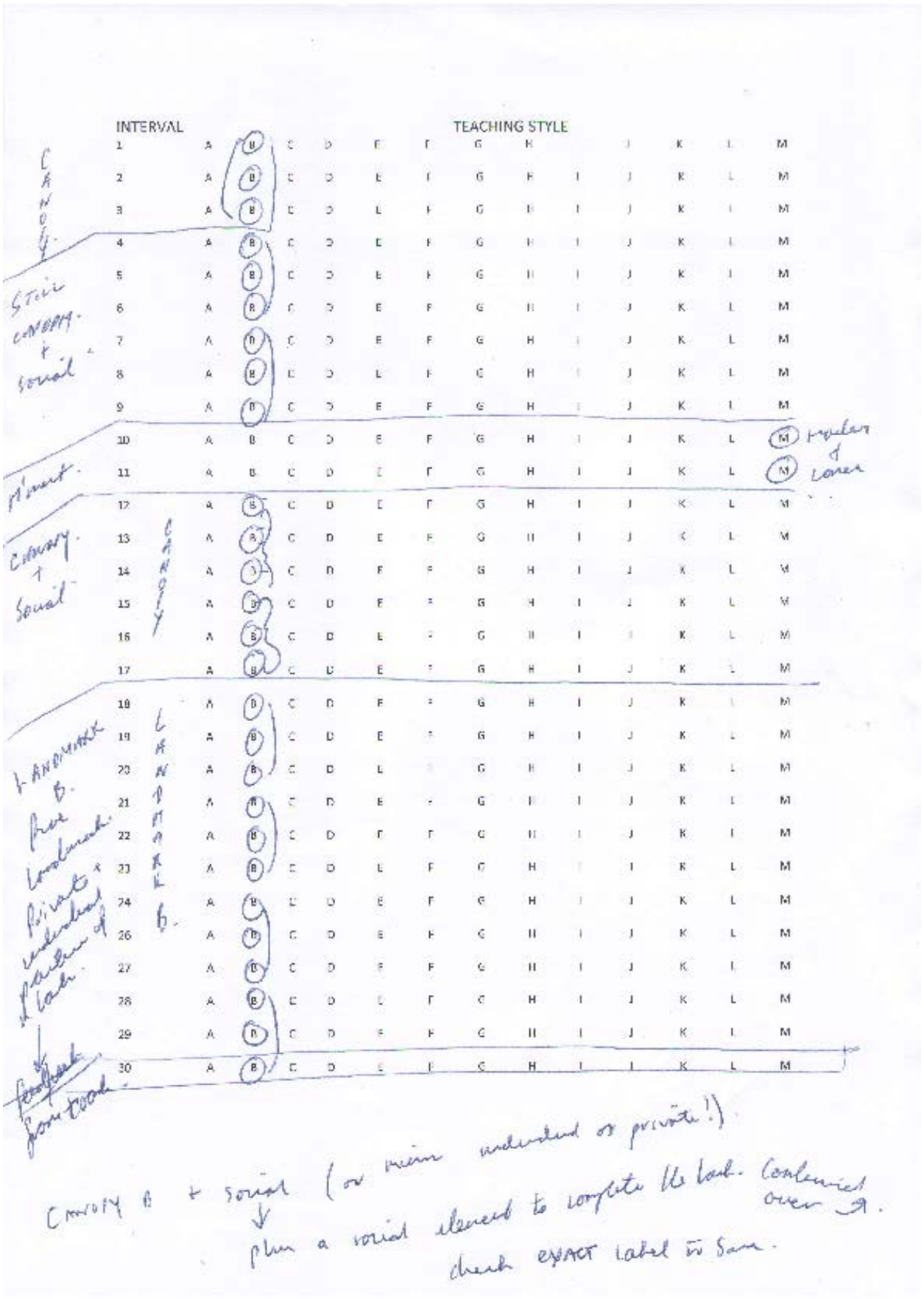
Name: Patrick

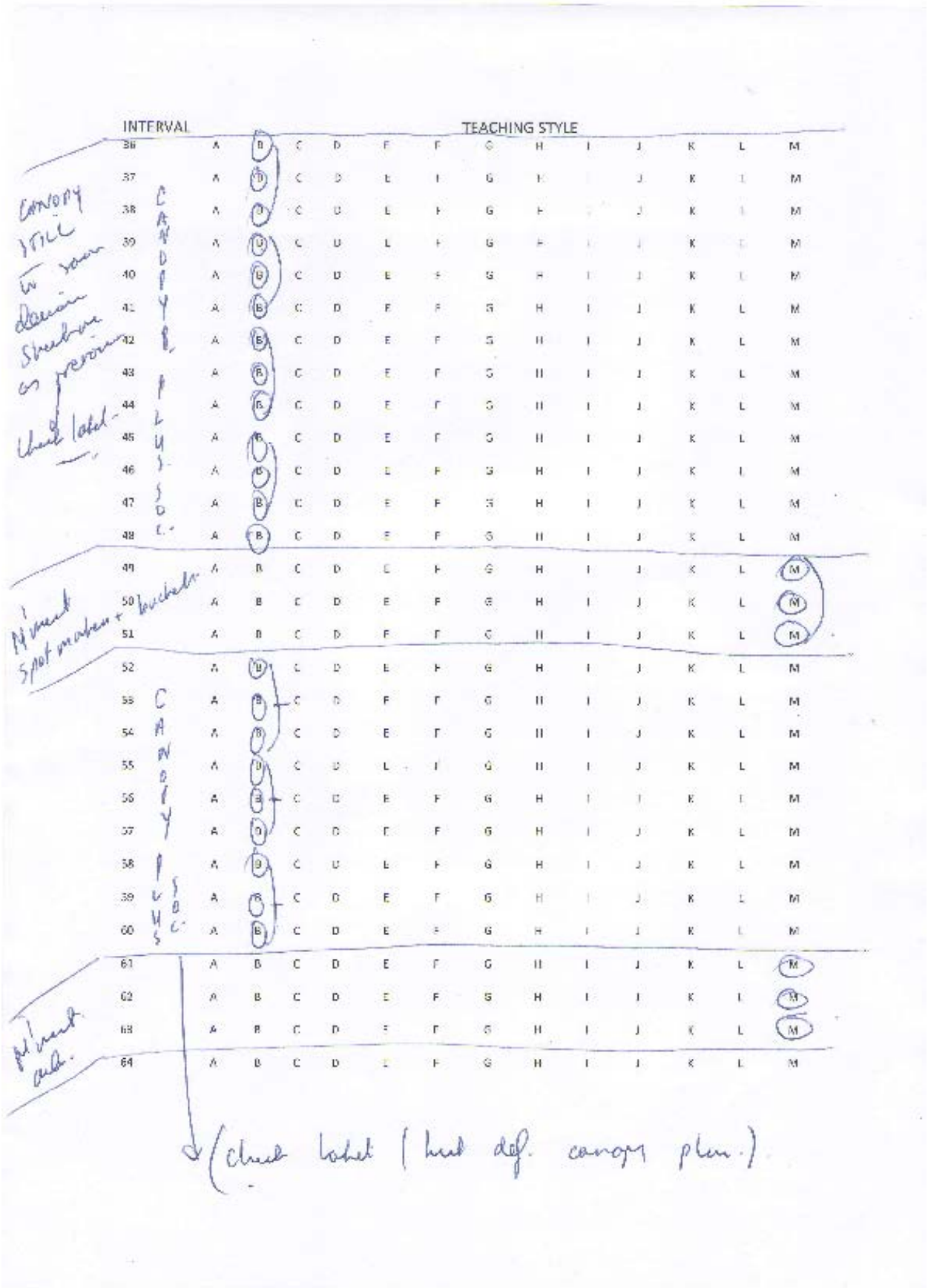
Lessons: Red. / 1

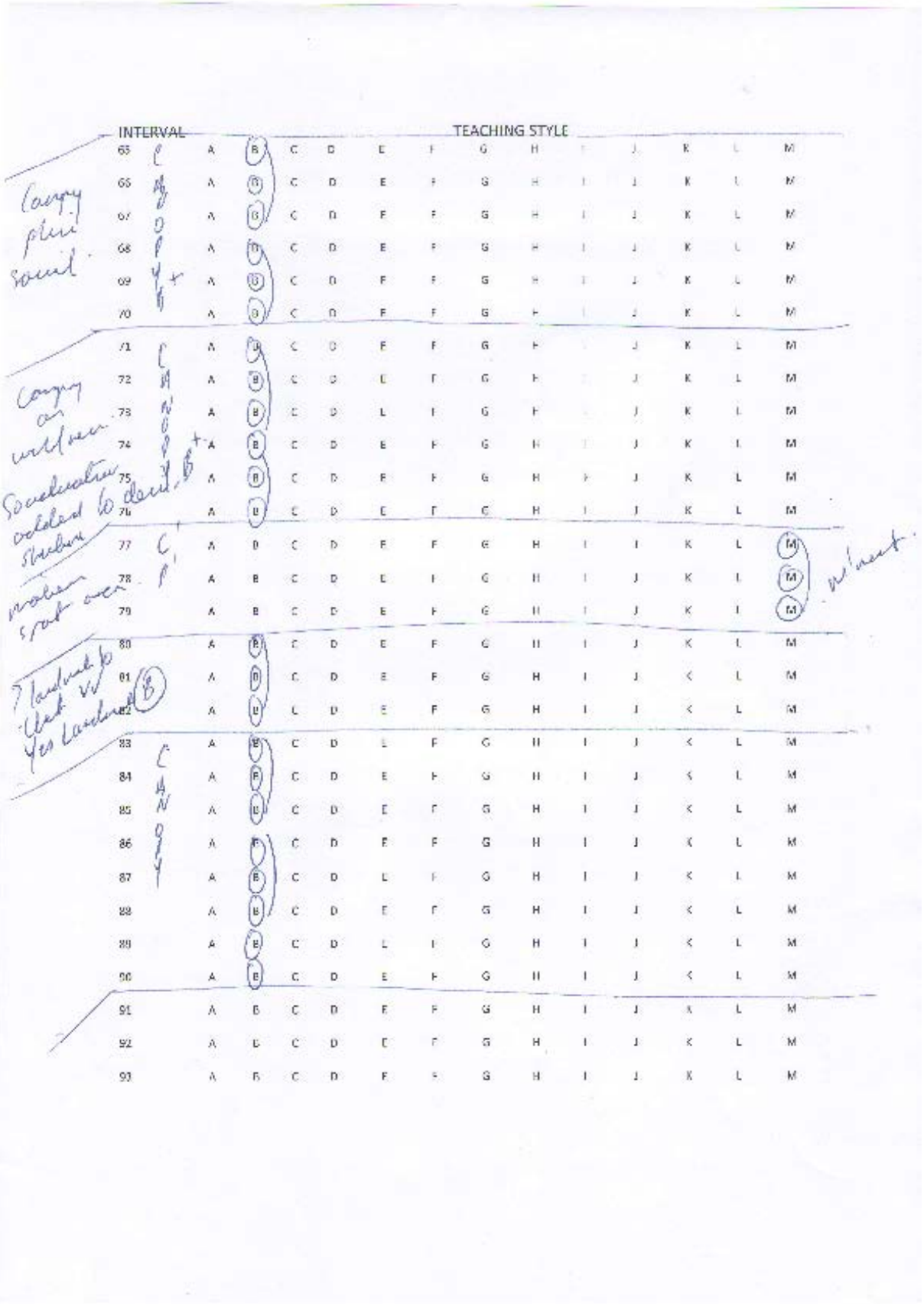
Description: Red.

State: VICTORIA

Course: TD MARCH.


INTERVAL
TEACHING STYLE
CANDY.
Static concept + social
Mimet.
Concept + social
CANDY
LANDMARK
1- ANDMARK
B.
free landmark
Private individual practice of task
feedback from task
M regular + lower
Concept B + social (or mimic individual or private!)
plus a social element to complete the task. Continued over
check EXACT label is same.


INTERVAL
TEACHING STYLE
CANOPY PLUS SOC.
CANOPY PLUS SOC.
(check label (last def. canopy plan.)



INTERVAL		TEACHING STYLE												
65		A	B	C	D	E	F	G	H	I	J	K	L	M
66		A	B	C	D	E	F	G	H	I	J	K	L	M
67		A	B	C	D	E	F	G	H	I	J	K	L	M
68		A	B	C	D	E	F	G	H	I	J	K	L	M
69		A	B	C	D	E	F	G	H	I	J	K	L	M
70		A	B	C	D	E	F	G	H	I	J	K	L	M
71		A	B	C	D	E	F	G	H	I	J	K	L	M
72		A	B	C	D	E	F	G	H	I	J	K	L	M
73		A	B	C	D	E	F	G	H	I	J	K	L	M
74		A	B	C	D	E	F	G	H	I	J	K	L	M
75		A	B	C	D	E	F	G	H	I	J	K	L	M
76		A	B	C	D	E	F	G	H	I	J	K	L	M
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85		A	B	C	D	E	F	G	H	I	J	K	L	M
86		A	B	C	D	E	F	G	H	I	J	K	L	M
87		A	B	C	D	E	F	G	H	I	J	K	L	M
88		A	B	C	D	E	F	G	H	I	J	K	L	M
89		A	B	C	D	E	F	G	H	I	J	K	L	M
90		A	B	C	D	E	F	G	H	I	J	K	L	M
91		A	B	C	D	E	F	G	H	I	J	K	L	M
92		A	B	C	D	E	F	G	H	I	J	K	L	M
93		A	B	C	D	E	F	G	H	I	J	K	L	M

Appendix D: Interview transcripts for two of the participants.

- **Interview 1: JD Tegan (pseudonym)**

1. Coaching background /learning influences on current instructional practices.

Question: Could you identify or tell me what has or have been the major influences on your current coaching or instructional practices?

2. Identify the instructional practices you employed during the three assessments.

Question: Can you describe the way you coached in each of the assessment lessons?

3. Interpret and define the instructional practices you employed during the three assessments.

Question: If you were to define these ways or instructional practices to another coach, what would you say?

4. Outline and discuss your reasons for adopting these instructional practices.

Question: Are there any particular reasons why and when you choose to use these ways – instructional practices when you are coaching?

R: Hello, Tegan, its Mitch Hewitt calling, how are you?

T: Good thanks Mitch, and you?

R: Yep, all good here. Are you sure that this is a good time for you to talk?

T: Yer, absolutely, no problems.

R: Now, I just wanted to confirm with you that it is ok for me to record our conversation today?

T: Yep, that's fine … no problems.

R: Ok, did you manage to have a look at the lessons that I recorded?

T: Yer … embarrassing ... just a little! It was hard to watch … but it was ok … quite interesting actually.

R: (mild laughter) It was fine wasn't it … your famous now … on TV… Interesting in a good way?

T: (laughter) Famous, yer that's right … yer it was … I got to really see what was actually happening … some things you think you do and then you don't … if that made sense?

R: Perfect sense … I'm glad that it helped out … Alright then, are you ready for a bit of discussion, some questions about your coaching sessions?

T: Ok, no problem.

R: Could you identify or tell me what has or have been the major influences on your current coaching or instructional practices?

T: You mean, like where I learned what I do on the court?

R: Yes, who have been your major influences?

T: The coach at where I am working has really taught me the most.

R: Is he the head coach?

T: My coach has had a big influence on the way I coach now. I still learn from him, like as a student, and just kinda automatically do what he does, the same activities and how to explain things. I can still remember how he coached me as a beginner, like the exact activities. I just try and use these activities because they were fun for me … its lots of games and stuff but with a real look at how they hit ... proper technique.

R: Can you describe the way you coached in each of the assessment lessons?
T: You mean like the ways I coach? ... game based … like that you mean?
R: Yes, your instructional practices.
T: Well, it was pretty much the same all the way through … I suppose … But having a look now at the video … there weren't so many questions.
R: Did you think that you asked more questions?
T: Well I thought my coaching method had more questions … yer the video really shows you different things doesn't it? ... like I like to ask a lot of questions to the students … my methods are mostly … probably mainly game-based approach and coaching I reckon ... In all the lessons I tried to get the students to figure out the answers … I tried to ask questions and get them to discover for themselves ... this coaching method is better I think for their learning … you have to keep them organised though or else they will muck around and not do what you want … like in the first lesson with the red ball kids … it was a bit of a disaster really … they couldn't do it very well ... no idea with the rallies … When I look at the video now I did heaps of talking … I can't stand the sound of my own voice! ... The second lesson, was a bit the same … I thought that I questioned, but I was telling them what to do, like how to do an activity, and then I tried to let them discover how to hit the shots this is a good approach – this is really a games based approach ... a games based approach or methodology but I did focus a lot on technique though ... there are heaps of different ways to coach though and you have to use all of them. Technique is pretty important … getting the kids to hit the right way, they have to be able to hit the right way, like swings and stuff … so concentrating on this way is good I reckon. Kids line up and the you just feed balls to them and they just practice hitting ... just concentrating on the actual swing shapes and grips ... once they get good or pretty good they can then play the game really … get them into a game … making decisions for themselves … the second and third assessments I did actually spend lots of time feeding the balls to the kids in pairs … I thought that I'd just show them what to do first and then get them into a game…they were good enough to play games … after some feeding … we all rallied … I tried to ask questions and let them go … but the activities were too advanced I think … they didn't get what I was saying really.

R: If you were to define these ways or instructional practices to another coach, what would you say?

T: I'd probably say that Game-based was about playing games ... scoring and rallying ... I only used mainly a game-based way during my three assessments so that would be it I reckon … games and rally … trying to get them serving and playing the game. Its not a good definition I know! ... when they are playing I can them tell them what to do … which shots and how to hit.

R: Ok, so GBA is about playing games with the coach telling the players how to play? Hit the ball?

T: Pretty much…is that right???

R: There is no or wrong answer ... these are your opinions so they are right.

T: Maybe.

R: No, its fine, it's really a very personal view – no right or wrong

T: Then game-play ... it's pretty simple for a definition isn't it? ... but its good … a focus on games and game play.

R: Do you think that other ways exist?

T: Well, I guess feeding the balls in to players … like drills I suppose ... you could do this.

R: Is there a specific term you might use to explain or define this way?

T: Command style ... maybe ... its command or really traditional coaching ... its a bit outdated and my coach doesn't really like us using this way during lessons … prefers questions.

R: No feeding balls to players?

T: Nah ... you can feed if you absolutely have to but let them start the point and rally.

R: How did you decide which way to use?

T: My coaching method is pretty much the same all the time ... I used the same way each lesson, but the first group didn't really get it ... they were badly behaved, the next two lessons was better, although I did think that I asked more questions ... I did a lot of telling and talking ... I really can't stand the sound of my voice ... having kids answer questions and explore ... having them explore ... If you tell them they wont remember and won't learn as much ... I kind of also did some feeding to two kids.

R: What about for different standards and ages of players? I'm pretty much the same generally. I reckon I tried to do games based approach with all three lessons, so beginner, intermediate or orange kids and better kids ... green ball … mean coaching tennis for me is ... well I use the same methods for all players I reckon ... with the young ones I need to be clearer … like slower when I speak, but the approach is the same.

R: Well, I don't wish to hold you up Tegan, I know that you have coaching after this, and I don't want to 'get you in trouble'!

T: Nah … that's cool … I have heaps of time to make it.

R: Well, was there anything else you wanted to say or mention today?

T: Not really ... I hope my answers were ok … made sense!

R: It is all excellent and very helpful information … thanks again.

T: No worries.

R: Just lastly Tegan, just so I have all this information that we have discussed today … accurately … can I email or post you a copy of the transcript of the

interview for you to read-over and check that you are fine with my interpretation – all listen to the interview and type out the contents.

T: Yep, that's ok.

R: I have your email address, so that's ok … if there is anything you wanted to add to this document, any changes or additions, please feel free to write the comments on the document anywhere is ok … and then just email it back to me will be fine … I am also happy to speak to you if you would prefer that as well … anything is ok ... if you wanted to have another chat ... just email or text me a good time for you and will ring you.

T: Yer, that's fine Mitch thanks for that..

R: Well, thanks again Tegan … I'll be in touch.

T: Ok, see ya.

R: Thanks, bye for now.

- **Interview 2: CP Andrea (pseudonym)**

1. Coaching background /learning influences on current instructional practices.

Question: Could you identify or tell me what has or have been the major influences on your current coaching or instructional practices?

2. Identify the instructional practices you employed during the three assessments.

Question: Can you describe the way you coached in each of the assessment lessons?

3. Interpret and define the instructional practices you employed during the three assessments.

Question: If you were to define these ways or instructional practices to another coach, what would you say?

4. Outline and discuss your reasons for adopting these instructional practices.

Question: Are there any particular reasons why and when you choose to use these ways – instructional practices when you are coaching?

R: Hello Andrea, how are you?

A: I'm really good thanks, how are you?

R: Very well, thank you. Thanks again for your time today, I greatly appreciate it.

A: No probs.

R: Just before we begin, I wanted to confirm with you that it is ok for me to record our conversation today.

A: No worries … that's ok.

R: Ok, excellent, now did you manage to watch the videos of your three coaching sessions?

A: Yes I did, I actually watched them a few times, it was interesting … it was the first time that I had actually watched myself coach … on the court … can't say that I

enjoy the sound of my own voice, but anyway … I got a lot out of it … I had my head coach watch it as well.

R: What did you think?

A: I actually learned a lot just from watching myself?

R: What did you get from watching?

A: That I need to change some of the things I do with the red ball kids especially, like I asked too many questions … it was like they didn't get it … too much time trying to ask questions … this guided discovery didn't really work so well ... or as well compared to the others … the orange and green kids.

R: Do you think that the questions were too difficult for them to understand?

A: Well, watching back now, not really, but it is just harder … like you have to ask more than once … and in the while [sic] they were standing around waiting … I was running around stressing about getting them active and playing and they just didn't respond as well.

R: Ok, well let's perhaps begin with one of my first questions and then, if its ok with you, we could return to this discussion … how does this sound?

A: Yer, anything is fine … no probs.

R: Could you identify or tell me what has or have been the major influences on your current coaching or instructional practices?

A: The coach at my coaching centre.

***R:* Is this a fellow coach at your club?**

A: No, it's Mike (pseudonym), the main coach … head coach at the club … he has been there for ages … great with the coaches and the kids.

R: Can you describe the way you coached in each of the assessment lessons?
A: I reckon that I used a combination of ways during my 3 lessons. But the games based approach or method was probably the one I used the most. I pretty much let the students discover and find the solutions to the problems themselves. When they couldn't do it though I told them. Technique is important … kids need to know how to hit the ball correctly … but you have to include them and ask questions. A more games based strategy or approach with lots of questions and discovery is definitely the best though … let then work it out … tennis is a game so getting them to figure it out for themselves will help them when they play on the weekend. I sometimes use constraints methods also though. But, now having watched the sessions, these questions that I tried to use didn't really work with the red kids.

R: Can you discuss the idea of constraints?

This method basically means setting challenges for the students to work through, but probably the challenges I had for really all coloured balls were probably too hard for them to get the rallies going.

R: Could you provide a practical example of this?

A: Like putting out targets and having the students figure out how to hit them … I also tried to get the green ball kids to hit past the service line in their serve return lesson and this was way too hard for them.

R: ***Is there any 'telling' in this way?***

A*:* No, constraints is like GBA, playing games and letting the students work out challenges … Just telling them doesn't help them … but sometimes you have to use different situations … like a game approach … playing games to teach them … feeding balls to kids is pretty old now … they have to figure it out … answer questions and solve the problem … the games based method where kids solve the problems … a feeding method where the coach just feeds the balls to students who hit back … focusing on technique … a technique centred approach … the discovery approach … I did notice that I started feeding with the orange kids though … its amazing watching myself coach … its like I strayed from the lesson plan.

R: Can you be more specific or perhaps provide an example?

A: Well, I guess I thought I was doing more games method, but in orange and green I might not have done this.

R: Ask questions?

A: Yer … I tried to get them playing games and rallying and finding out for themselves, but I did notice how much I really told them what to do…how to hit and really where to hit … like tactics.

R: Is this (discovery method) like a games-based method that you just mentioned?

A: It's the same … pretty much the same.

R: You mentioned that you used a combination of ways in all three of your assessments earlier on … you mentioned Game-Based … what were the other ways that you used?

A: Mmmmm … command I guess was the other option.

R: Can you tell me a bit about this way?

A: Command style is basically ... a bit more traditional … more feeding to the kids for success … good for success though.

R: When might you use it?

A: I don't use it much … maybe just something different … as I said most of my coaching is discovery or games based with constraints … gets them thinking … and learner quicker.

R: So you used this way in all three assessments?

A: Well I tried … but, my coach asked why I didn't ask more questions and get them rally more.

R: If you didn't have the players rallying, can I ask what you had them do?

A: I hit to them … gave them a few drills … the rally was too hard … they just couldn't drop and hit … that was the red kids … the orange kids were a bit better, but they couldn't get it either really … so feeding and some drills was better at the time … the green kids were probably the best … they could rally at least.

R: If you were to define these ways or instructional practices to another coach, what would you say? The coaching ways you used during your three assessments

A: Well, I'll start with games-based approach, or discovery method … same definition I will provide for both. Basically, its about playing games … rally games that are like the actual game … Kids need to figure out why and how they are doing

stuff and make decisions … the coach helps them along by asking questions and the kids pretty much teach themselves … the games sometimes have constraints … so I guess game-based approach and constraints based approach are the same … basically defined as the same.

R: What about … did you call it command and I think the other word you used was traditional?

A: Just feeding from the coach and drills I suppose … bit old fashioned.

R: Are there any particular reasons why and when you choose to use these ways – instructional practices when you are coaching?

A: If I am coaching beginners, you have to be slower, and simpler. But, its all about game based really, asking questions gets kids learning … I really should be taking my own advice here … I usually just try and use games based all the time … games and questions … let them figure it all out … they learn more … but I didn't really do this … maybe younger kids need less questions … the learning facilitator was pretty big on questions and discovery though … but anyway I thought I used more discovery with the older ones in orange and green but I didn't really … ahhh, I'm confused now.

R: Don't worry, tennis coaching is challenging.

R: Do you usually use this way with all ages of students?

A: You make the questions simpler, easier words and that … but its pretty much the way I do it. the same way … but the tactics have to be easier as well My coaching method is pretty much the same all the time … I used the same way each lesson … having kids answer questions and explore … having them explore … If you tell them they wont remember and wont learn as much … What about for different standards and ages of players? … I'm pretty much the same … I mean coaching tennis for me is … well I use the same methods for all players I reckon … with the young ones I need to be clearer … like slower when I speak, but the approach is the same.

R: After watching the video recordings of your coaching, would you change anything?

A: Maybe to break it down a bit more for the younger ones ... my coach said I had to keep it simpler … keep the rallies going but simplify it … instead of drop and hit and rally, have the kids underarm throw and catch in a bucket … I dunno why I went into feeding, but it made it easier for me to control them when they werent having success.

R: Was this the case with all three assessments?

A: When I look back at the lessons, yes it definitely was.

R: Oh well, then perhaps the video recordings gave you some insight into how you actually coach and what you look like on the court?

A: Definitely, it did ... my coach and I had a good chat about all the lessons and ways to improve them.

R: That's good … I'm pleased … Well before we finish Andrea, was there anything else you wanted to mention with regard to your coaching, this discussion, the video recordings?

A: maybe confusion now (laughing) … its hard isnt it ... now I see myself doing things that I didn't really know I did ... I'll probably get the coach to video more of my lessons … I might do less questions with the red ball kids too … my coach mentioned that some of the questions were just too hard and that also some of the rally activities were just too difficult … I really needed to break it down for them.

R: And what about the other standards of students (in the orange and green ball)?

A: Yep, probably for them too … my coach did mention that it might be necessary to feed the ball every now and then … based on your kids.

R: That's sounds like an interesting conversation you had with your coach … Would it be ok, Andrea, that after I have listened to this interview and typed up the transcripts that I send you a copy for you to check that I interpreted it correctly … and got it all right?

A: Yes that's no worries … it will be good to read it back.

R: Alright then Andrea, if there is anything else you need to mention, I'd be happy to take your call or an email … otherwise I'll email the transcripts and if you would like, or if you have any changes or modifications please feel free to write or type them in the document and email it back … as I said, if you want to ring me with any extra or added information that's ok … or if you want to text or even email this information, that's fine as well … anything will be ok for me.

A: Thanks Mitch … much appreciated.

R: Ok, well thanks again Andrea for all your time today … it has been very helpful … so thanks very much again.

A: No problem … its been interesting to talk more about methods and coaching … and discussing the DVDs … I found it useful to reflect on the lesson while actually watching it, rather than just discussing or talking about it.

R: That's terrific feedback Andrea, thanks again for your help … I'll email the transcripts as soon as I can.

A: No problem.

R: Ok, bye for now Andrea.

A: Yep, see ya Mitch.

Appendix E: University of Southern Queensland ethics approval.

University of Southern Queensland
TOOWOOMBA QUEENSLAND 4350
AUSTRALIA
TELEPHONE +61 7 4631 2300
CRICOS: QLD 00244B NSW 02225M
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OFFICE OF RESEARCH AND HIGHER DEGREES
Ashley Steele
Ethics Officer
PHONE (07) 4631 2690 | FAX (07) 4631 1995
EMAIL steele@usq.edu.au

Wednesday, 7 April 2010

Mitchell Hewitt
8 Raynes Street
South Caulfield
Melbourne VIC 3162

Dear Mitchell,

Thankyou for submitting your project below for human ethics clearance. The Faculty Ethics Chair recently assessed your application and agreed that your proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research*. Your project has been endorsed and full ethics approval granted.

Project Title	Teaching Styles of Australian Tennis Coaches: An Exploration Using Mosston and Ashworth's Spectrum of Teaching Styles
Approval no	H10REA064
Period of Approval	25/03/2010 – 25/03/2011
Faculty Decision	**Approved with recommendations:** 1) it is suggested the applicant include a sentence in para 3 of the 'information to participants' which explicitly asks participants to avoid using any identifying terms in their responses

Please note: the application is approved unconditionally; the recommendations have the status of informal advice which you are not obliged to take note of.

The standard conditions of this approval are:

(a) conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC;
(b) advise the HREC (email: ethics@usq.edu.au) immediately if any complaints or expressions of concern are raised, or any other issue in relation to the project which may warrant review of ethics approval of the project;
(c) make submission to the HREC for approval of any amendments, or modifications to the approved project before implementing such changes;
(d) in the event you require an extension of ethics approval for this project, please make written application in advance of the end-date of this approval;
(e) provide the HREC with a written "Annual Progress Report" for every year of approval. The first progress report is due 12 months after the start date of this approval (by **25/03/2011**);
(f) provide the HREC with a written "Final Report" when the project is complete;
(g) if the project is discontinued, advise the HREC in writing of the discontinuation.

For (c) to (f) proformas are available on the USQ ethics website: http://www.usq.edu.au/research/ethicsbio/human

Please note that failure to comply with the conditions of approval and the *National Statement on Ethical Conduct in Human Research* may result in withdrawal of approval for the project.

You may now commence your project. I wish you all the best for the conduct of the project

Yours sincerely

Ashley Steele
Ethics Officer
Office of Research and Higher Degrees

Appendix F: Tennis Australia approval letter.

Tennis Australia
Batman Avenue
Victoria Australia
Private Bag 6060
Richmond Victoria 3121
T +61 3 9914 4000
F +61 3 9650 2743
www.tennis.com.au

September 9, 2010

RE: Mitchell Hewitt research project with Tennis Australia coaching course participants

To Whom It May Concern

I hereby provide written approval and consent for Mitchell Hewitt to approach the participants involved in tennis coach accreditation courses with Tennis Australia for the purposes of a doctoral research program with the University of Southern Queensland.

I also permit Mitchell to have access to the practical on-court assessment lessons that Tennis Australia video and record for the purposes of his doctoral research program with the University of Southern Queensland.

If you have any further questions in regards to this matter please contact me.

Yours sincerely

Patrick McInerney

National Coach Education Manager
Tennis Australia

T: 03 9914 4263
E: pmcinerney@tennis.com.au

Tennis Australia Limited
ABN 61 006 281 125

Appendix G: Plain English language statement and letter of invitation for the coaches to participate in the study.

Plain English language statement/letter of invitation

Dear Sir / Madam,

My name is Mitchell Hewitt and I am currently involved in an approved doctoral research program through the University of Southern Queensland that is being supervised by Associate. Prof. Ken Edwards. The study is involved with researching the practices and insights of tennis coaches in relation to teaching styles. The title of research project is:

Teaching Styles of Australian Tennis Coaches: An Exploration Using Mosston and Ashworth's Spectrum of Teaching Styles.

Apart from anecdotal reports, little is known about Australian tennis coaches' practices and insights in relation to the teaching styles they use during coaching sessions. It is hoped that this study will assist in informing future professional development initiatives in coach education.

The study consists of three stages. **Stage 1** is an anonymous survey questionnaire. The questionnaire poses questions about your coaching habits as well as your insights in relation to the teaching styles you use during coaching sessions throughout the year. It takes approximately 20 minutes to complete.

Stage 2 of this research project consists of video-recording three 30 minute coaching sessions from your coach accreditation course. The purpose of these video-recorded sessions is to identify the teaching styles that you use during coaching sessions.

Stage 3 of this research project consists of conducting an interview. As all your comments, opinions and insights in relation to your coaching experiences in tennis are highly valued, this interview will be approximately 45 minutes in length (or longer if you wish to share additional insights and information).

All the information you share during this study will be treated in the **strictest confidence**.

If you have any questions about this study, please do not hesitate to contact me on 0412 099 090 or alternatively at [mitch_hewitt@hotmail.com].

Yours sincerely,

Mitchell Hewitt

Appendix H: Consent form for the coaches participating in **Stage 2** (observations) and **Stage 3** (interviews) of the study.

Participant Consent Form

Please read the following statements and initial each corresponding box if you wish to participate in the interview and observation stages of this study

I confirm that I have read and fully understood the plain English language statement/letter of invitation that provided details about the nature and purpose of the research study. ☐

I understand that my participation in this research study is voluntary and that I have the right to withdraw from the project at any stage and reserve the right not to answer any questions. ☐

I understand that during any analysing or reporting of data obtained from interviews, observations or any other discussions in relation to the research study, the researcher will maintain all my responses as strictly confidential and anonymous and will not reveal my identity. ☐

I agree to have my words, recorded tennis sessions, any of my written material used as data for the purpose of this research. ☐

I confirm that I may request to examine the transcripts of my interviews to ensure that they are an accurate representation of my statements and comments during the interview procedures and may alter any comments or answers if so desired. ☐

I understand that this study may be published in professional journals and may be used for educational purposes and/or presentations. ☐

I confirm that I have read and personally initialed this consent form and have been provided with the opportunity to ask questions, which I have subsequently received satisfactory answers for. I therefore confirm my consent to participate in the observation and interview component of this research study.

Participant's name:_____

Signature:_____Date:_____

I confirm that the research participant has read this consent form in addition to a Plain English language statement/letter of invitation outlining details about the nature, purpose, and procedures of the study. All questions were answered to the participants' satisfaction.

Researcher:_____

Signature:_____Date:_____

Appendix I: Plain English language statement and letter of invitation for the parents or guardians of the players to participate in **Stage 2** (observations) of the study.

Plain English language statement/letter of invitation

Dear Sir / Madam,

My name is Mitchell Hewitt and I am currently involved in an approved doctoral research program through the University of Southern Queensland that is being supervised by Associate. Prof. Ken Edwards. The study is involved with researching the practices and insights of tennis coaches in relation to teaching styles. The title of research project is:

Teaching Styles of Australian Tennis Coaches: An Exploration Using Mosston and Ashworth's Spectrum of Teaching Styles.

Apart from anecdotal reports, little is known about Australian tennis coaches' practices and insights in relation to the teaching styles they use during coaching sessions. It is hoped that this study will assist in informing future professional development initiatives in coach education.

Part of this research project consists of video recording three 30 minute coaching sessions. The sole purpose of these video-recorded sessions is to identify the teaching styles that coaches use during coaching sessions. Your role in this project will be to participate, as a player, in one of the 30 minute coaching sessions.

If you choose to participate in this project, your child will be video-recorded playing tennis. Any video-recordings will be stored securely and only the research team will have access to the recordings.

All the information you share during this study will be treated in the **strictest confidence**.

If you have any questions about this study, please do not hesitate to contact me on 0412 099 090 or alternatively at [mitch_hewitt@hotmail.com].

Yours sincerely,

Mitchell Hewitt

Appendix J: Consent form for the parents or guardians of the players participating in **Stage 2** (observations) of the study.

Parental or guardian consent form

Please read the following statements and initial each corresponding box if you wish your child to participate in this study

I confirm that I have read and fully understood the plain English language statement/letter of invitation that provided details about the nature and purpose of the research study. ☐

I understand that my child's participation in this research study is voluntary and that they have the right to withdraw from the project at any stage and reserve the right not to answer any questions. ☐

I agree to my child being video-recorded playing tennis and that these video- recordings will be used in this study to identify the teaching styles of coaches. ☐

I understand that this study may be published in professional journals and may be used for educational purposes and/or presentations. ☐

I confirm that all procedures relating to the research study have been explained to me and that all my questions have been thoroughly answered. ☐

I understand that the video-recordings will be stored securely and only the research team will have access to the recordings. ☐

I confirm that I have read and personally initialed this consent form and have been provided with the opportunity to ask questions, which I have subsequently received satisfactory answers for. I therefore confirm my consent for my child(s) participation in this this research study.

Parent/guardian:_____

Signature:_____Date:_____

I confirm that the research participant has read this consent form in addition to a plain English language statement/letter of invitation outlining details about the nature, purpose, and procedures of the study. All questions were answered to the participants' satisfaction.

Researcher:_____

Signature:_____Date:_____