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A qualitative investigation of elite golf coaches' knowledge and the epistemological chain

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Abstract

The aim of the study was to explore the existence and application of the epistemological chain (EC) construct in the decision making of elite golf coaches. Eight male expert golf coaches were recruited for the study. Employing a qualitative methodology, semi-structured interviews were conducted to gain understanding of the participants' perceptions and application of the EC and to determine its overall effect on their knowledge development. Data were analysed to identify themes using interpretive phenomenological analysis (IPA). Results indicate the EC is indeed present in the coaching of elite golfers and implemented in a structured and coherent form. This raises a number of interesting issues regarding coach and player development that may impact upon future pedagogical provision.

Introduction

Effective learning has been shown to be an important precursor of performance (MacPherson, Collins and Obhi, 2009). Therefore the creation of an optimum learning environment and the promotion of learning itself are crucial affecting the quality of learning that will take place. In deciding what, where and how to teach something, sports coaches are faced with a number of choices regarding aspects of their professional practice. For example, coaches are confronted with challenges regarding the knowledge transfer methods they adopt, the setting of their player or players' motivational climate, their creation and modification of the coach / athlete relationship, and so on (Poolton, Maxwell, Masters and Raab, 2005; Maxwell, Masters, Kerr and Weedon, 2001; Mageau and Vallerand, 2003). Researchers have offered support for these decisions via a plethora of templates and toolkits (Lyle, 2002; Cushion, Armour and Jones, 2006; Abrahams, Collins and Martindale, 2006). What has not been available, however, is a reliable and comprehensive method by which coaches themselves can evaluate their own and others' choices of such planning process and interventions; in particular, one which could be used to guide, or even self-guide, the coaches' future behaviour and provide them with a ready-made developmental framework. One method, hereto neglected but we believe to be of great value to sports coaching, is the epistemological chain (EC).

In a previous paper we introduced the EC construct and discussed its possible applications in sports coaching (Grecic and Collins, 2011). For the purposes of the present investigation we defined the EC as the inter-related / connected decisions made that are derived from high-level personal beliefs about knowledge and learning, and which become apparent through the planning processes adopted, the learning environment created, the operational actions taken and the review and assessment of performance. Here a person's epistemological stance informs their decision making process at a macro, meso and micro level. We have also discussed and highlighted the EC's potential utility and value in not just the act of coaching itself but also with regard to the training, development and selection of the coaches. Decision making based on one's epistemology has been commonly evidenced and exploited in other fields (Evetts, 2001, 2003; Pavel and Ramoni, 2001; Martindale and Collins, 2005; Tickle, Brownlee, and Nailon, 2005) but is an under-researched area within a sporting context.

Working from the premise that the EC exists in the sporting domain it would seem pertinent to examine in detail how this process is articulated. In particular, questions may concern how the EC operates in a coherent manner with each defined stage of the decision making chain, each flowing seamlessly from its predecessor. Alternatively the EC may exist in a much more ad hoc, incoherent form, with choices made in a more limited, ad hoc and/or unsystematic way. If such inconsistencies are in fact present we must then determine whether this incoherence leads to a detrimental effect on coaching performance, or whether such operation is in fact a planned and consciously directed action leading to desired behavioural outcomes in the athlete? Finally assuming that the EC is indeed present in sports coaching (in golf) we will need to uncover its origins and how it has been developed. In this way our findings might inform the future training requirements of sports coaches for them to benefit from the utility of the EC. This exploration will undoubtedly highlight the potential for refinement of current National Governing Bodies' coach education courses, who may also need to appreciate the role of formal, non-formal and informal learning on the development of the EC.

In summary therefore, this study had three purposes; to determine whether the EC exists in sport coaching, to determine how it operates, and to ascertain how it is developed. In order to gain this insight, the study examined a purposeful sample of experienced coaches in the sport of golf. The sport has been chosen as it is characterised by its long developmental process, the strong personal relationship developed between coach and player, and the plethora of views and opinions on the best ways to coach the game. Consequently, claims that are may from this study may be limited to this group of respondents within golf alone. However, findings permit inferences to be made about coaching processes across a wider range of sports.

Methods

The decision making processes of elite coaches and their modes of work and interaction can be interpreted from different positions depending on the philosophy; values and beliefs of the particular observer. No two observers would allocate value in the same way to the identical coaching behaviour they witness. For this reason interpretive phenomenological analysis (IPA) was deemed the most suitable method rather than, for example, grounded theory. This study sought to enable an understanding of the individual experiences of the coaches and gain an "insider's perspective" (Conrad, 1987) into their philosophy, epistemology and behaviour for which IPA methodology has been well utilised. Indeed Smith, Flowers, and Larkin (2009) explain that IPA as a qualitative research approach is committed to the examination of how people make sense of their major life experiences. Its aim is to explore lived experiences and how participants themselves make sense of these events rather than fix these experiences into pre-defined categories. As Smith, (2011:9) points out,

> IPA is concerned with the detailed examination of personal lived experience, the meaning of experience to participants and how participants make sense of that experience.

IPA recognises that the researcher needs to be located in the research dialogue in order to get close to the subject's perspective but also that such a perspective can never fully be achieved as a researcher cannot fully or completely understand the world of the interviewee. Consequently there is a "double hermeneutic" (Smith, Jarman, and Osborn, 1997) of interpretive activity whereby the researcher is trying to make sense of the participant whilst trying to make sense of what is happening to them. A further reason to use IPA has also been suggested by Smith and Osborn (2008) who point out that IPA is a useful approach to take if the area being studied is under researched or new. This certainly is the case in the specific domain of elite golf coaching.

Participants

In accordance with IPA guidelines (Smith and Osborn, 2007) a homogenous sample was purposively selected, a total of eight golf coaches participating in this study. These coaches had an average age of 52 (M = 52) (SD = 7) and each had over 20 years of coaching experience. (M = 24), (SD = 4). The coaches were selected on the basis of both their experience and on their relative coaching position within the realms of elite golf. Thus each of the sample were, at the time of interview, the recognized coach of an adult national squad and / or players competing on golf's pinnacle professional tours, that is to say, the US PGA and European PGA Tours for both men and women's golf. All coaches were male and all were Great Britain and

Ireland Professional Golfers' Association (GBandI PGA) qualified teaching professionals. As such they formed a homogenous but high level sample on which to base the research.

Procedure

The coaches were recruited following the inaugural England Golf Union (EGU), England Women's Golf Association (EWGA), Professional Golfers' Association (PGA) Coaching Conference at Woodhall Spa, England in January 2010. Initial contact was made with the England national coaches and those coaches present at the conference who were known to be working with elite level golfers. This was followed up with email requests to participate in the study. This provided the first author with the opportunity to discuss the nature and purpose of the study, explain the issues related to confidentiality and anonymity, as well as emphasising the voluntary nature of the study. Informed consent was received from the coaches who agreed to participate. Subsequently arrangements were made to conduct the interviews at a mutually convenient date, time and venue. These included the coaches home golf club (n = 5) and during national squad coaching sessions (n = 3).

Designing the interview guide

A semi-structured interview guide was developed based on IPA in order to seek to explain how the participants make sense of their personal and social world (Smith and Osborn, 2007). The interview schedule was developed following Smith and Osborn's (2007) guidance, with interviews guided rather than dictated by the schedule. They were constructed by first thinking about the broad issues under investigation. These issues were then placed in the most appropriate sequence. Questions were created relating to these topics, and possible prompts and probes considered. Although a framework of questions relating to the coaching decision making process was formulated at no point was the EC referred to in any way. Each element of decision making was dealt with in isolation. In this way any linkages made between elements of the framework would emerge from the coaches' own personal beliefs rather than being encouraged by the interview design. Specifically a bespoke five section interview guide was created for this study. The first section included an opening question designed to introduce the main topic of the study and help initiate discussion, for example, 'What is your overall coaching philosophy?' This section was constructed to extract information about the coaches' sources of knowledge, experience, values, beliefs and so forth. The second section was designed to learn about their coaching practices, followed by the perceived impacts of their coaching, the relationship that they consciously managed, and any pressures that affected their coaching. The format was chosen because we felt it was first important to understand the coaches' philosophy, their knowledge sources and epistemology before delving into the more practical applications of their behaviour

in order to ascertain if an EC did in fact exist. Probes were used throughout the interviews to help the researcher explore the comments provided by the participant (Patton, 2002).

The interviews were all carried out by the first author who has worked in the field of professional golf for the last 10 years and is the director of a golf research institute. Prior to beginning each interview the participants were provided with a detailed explanation of the study and asked to give their consent to participate. Following introductions and this orientation period, actual interviews lasted from 30 to 90 minutes and were transcribed verbatim. Finally participants' confidentiality was protected through the use of a coding system that replaced each name with a number (i.e. coach (C) 1 - 8). In addition any potentially identifying information (e.g. names of players, home club, home town, etc.) was also replaced or disguised.

Data analysis

Analysis was carried out on the data using IPA procedures suggested by Smith and Osborn (2008) and further defined by Smith *et al*. (2009). The transcribed interviews were read several times. From these readings initial themes and key phrases were extracted and coded. The process entailed the following stages. First the transcripts were read and re-read to get a sense of meaning. The scripts' emerging concepts were then identified and coded. The researchers were aware of their own influence upon data interpretation and endeavoured to bracket their own views as much as possible in order to concentrate on the detailed examination of the particular participants account. However the process acknowledges the influence of the researcher on the process, and the analysis being inevitably a personal process, based on the interpretative work which the investigator does at each stage of this process (Smith and Osborn, 2008).

The next stage involved these emerging themes being clustered together with higher-order themes being highlighted and identified. Throughout the interpretive process, it was ensured that all meaning units and themes were supported by the text. After the raw data themes and lower-order themes were identified for each individual transcript the next step was to identify connections across the different themes. This process was repeated with each interview transcript in turn. Finally patterns across the eight transcripts were uncovered and compared with linkages and discrepancies within the data highlighted. To ensure the accuracy of groupings all themes and meaning units were continually referenced against the original data.

Trustworthiness

Research bias: Just as quantitative research strives for validity and reliability, qualitative research seeks to diminish the possibility for misinterpretation or

mishandling of data through means that enhance trustworthiness (Lincoln and Guba, 1985). Several approaches were employed to ensure data trustworthiness (cf. Guba and Lincoln, 2008; Sparkes and Smith, 2009). As the goal of IPA is to get experientially "close" to the phenomenon rather than experientially "far" from it researchers must be aware of possible research bias in their study. As noted previously, researchers seek to gather rich data and thorough descriptions from the participants own experiential perspectives (see Husserl's work for fuller description of this process which he terms "epoché", that is one should look before one judges, and not judge until there is sufficient evidence). Therefore it is important for qualitative researchers to identify and attempt to suspend their own pre-existing beliefs that may impose biases through the research process. This Husserl called 'bracketing'. Therefore the author attempted to suspend his own views, taking special care not to give any visual or verbal cues or feedback.

Member checking: External member checking was used after the data analysis was completed to ensure the adequacy of the information and protect against potential misinterpretations and researcher subjectivity (Lincoln and Guba, 1985). The process of internal member checking was however not adopted. This was a conscious decision by the researchers taken in order to eliminate any bias in the planned follow up study.

Trust: Finally the reliability of the data was also augmented by the trust and rapport developed by the first author having spent time with the coaches at various professional, national and international golf tournaments, coaching conferences, national training camps and through interaction linked to his paid employment.

In summary we appreciate this form of qualitative research applying IPA analysis dictates that there is a great deal of personal interpretation both on the part of the participant and the researcher. According to Parker (2005) however, this enables a more personal phenomenological approach to investigation over quantitative research. It also allows us to more fully understand the individual experiences of the golf coaches with regard to their personal epistemology and their subsequent decision making processes. Therefore the findings of this research reflect the interpretation of the data by the authors.

Results

Following the initial analysis 351 individual coding units were identified. These were brought together into clusters which created 64 raw data themes. These were then collated into 13 lower-order themes and then these in turn were amalgamated into 7 higher-order themes as illustrated in Table 1 below.

Table 1. Analysis of themes from coach interviews

Raw data themes	Lower-order themes	Higher-order themes
Negotiation process	Openness	Coaching environment created
Communication		
Player expectations		
Reputation		
Trust	Caring and supportive behaviour	
Caring		
Respect		
Fun		
Individual focussed	Player Led	
Player initiated		
Work it out themselves	Autonomous decision maker	Creating self- reliant players
Understand your swing		
Commentators		
Decision making		
Empower		
Autonomous learner		
Self analysis	Assessing Success	
Facilitate learning		
Recording progress		
Assessing Success		
Guidance		
Personal development		
Access to player	Accessibility	Barriers to success
Barriers to player progress		
Pressure	Fear	
Blame		
Fear of failure		
Players distractions		
Tips		
Tour		
Industry training PGA	Own experiences	Sources of coaching knowledge
Influence		

Studying golf		
Martial arts		
Significant other	Knowledge sources	
Own experiences		
Mentors		
Learning		
Broad knowledge sources		
Long term focus		Planning progress
Progressive targets		
Short term focus	Focus	
Reflection		
Cause and effect		Coaching practices employed
Fault fixing		
Model		
Competition		
Challenges		
Common denominators		
Games	Exploration	
Competitive practice		
Opportunity to coach		
Questioning		
Early specialisation		
Improvements		
Proof		
Information	Explanation	
Right attitude		
Return on Investment		
Simple		
Talent	Coaching coaches	Coach development
Coach development		
Peer attitudes working relationships		
Coaching coaches		

The results offered evidence from all participants making explicit linkages up and down the EC. This study will utilise the super-ordinate themes of; broad knowledge sources, learning relationships, autonomy-supportive behaviour, and player centred coaching in order to explore what may constitute the epistemological chain for these coaches. Following IPA guidance on what constitutes an acceptable and valid range of data, we have endeavoured to provide quotations from at least 50 percent of the sample with regard to each of the study questions (Smith, 2011). In most instances we have selected fewer but longer quotes in order to demonstrate the richness of data in the participants' own words.

Does the EC exist?

In assessing whether the EC actually exists, one first needs to consider its full articulation through the stages from epistemology to performance (see table of themes from coach interviews). On examination there appears to be a clear and direct relationship between the coaches' epistemology and their behaviour which mirrors the results uncovered in studies from other fields and from education in particular. The coaches demonstrate a range of knowledge sources that support a sophisticated epistemology including various forms of informal and non-formal learning. Interestingly all the coaches in this study have been Tour professionals themselves before completing their industry training through the PGA. Each participant views this initiation into golf coaching as the starting point on their learning journey rather than a sign of coaching competence or mastery. As such these beliefs are evident in their attitudes to their players' learning, the relationship they consciously created, and in the coaching methods and practices they adopt. For example C1 describes the sources of information he has explored to develop his own coaching knowledge:

> You listen to different professionals and different coaches, and you even listen to the amateurs as well. You listen to how they respond to how you teach, and how you coach them, or work with them. I have also sat in lots of seminars with top coaches and listened to them. You try to glean as much information as possible.

C2 meanwhile describes the path he has taken in adopting a broad and sophisticated epistemology:

> My philosophy of golf coaching is obviously something that has developed over the years and hopefully continues to develop. I think at a pretty early stage in my coaching career I was very much into golf coaching being very technical (….) I was fortunate to meet some people that proved that there was a lot more to golf coaching than just a golf swing, and I think through that and through the work I have been involved in over the years, have come to terms with golf coaching being about just about anything and everything (….) I think I've sort of been very, very narrow, to being extremely broad, with an understanding that I am not going to be an expert in

> all those areas to influence performance, but I can know a little bit here, a little bit there and I can have a bit of a network of people who I know and trust and can work with who are better than I am in those areas.

This coach in particular attributes his development to the environment of professional golf in which he is 'fortunate' to operate:

> Because whatever environment you are in you will get the opportunity to meet certain people, and you will get your hands on certain books, and people will give you advice in various ways, and I think I became somebody who just followed different advice, I learnt through books and people I met with, and I had a bit of a drive to continue to ask questions, and to find out new ideas and new principles by meeting, reading, watching golf, watching videos, learning through seminars, learning through lots of other areas as well. Because I think we are sort of, a little bit narrow in our way of looking at golf and I think we have a lot to learn from other sports.

Many of C2's comments are echoed by others. For example the point of learning from other sports is highlighted as a valuable knowledge source in the interviews of three of C2's fellow coaches. Other similarities include the exploration and experimentation undertaken initially with the selfish purpose of benefiting their own game, and the seeking of information from their playing peers, coaches, books, journals, seminars and television. C3 supports these overarching points:

> I think you do read a lot. I've got a library that will fill that wall twice over probably. I think you read, you work with other coaches, players, you question yourself, you question others, you learn, you go on seminars, training courses.

C4 also corroborates these methods of knowledge exploration:

> I decided to go off to America and went to see the so called 'guru' coaches. I spent time with Coach A, the Coach B Academy, a few others to find out what made them good coaches. So I researched it….. And I came back and I pieced it together and then I went down to the martial arts…. I went to see a martial arts trainer to see how they trained. He had never played golf. So I found out from other sports what made good coaches.

C6 also notes his own progression from a very narrow to a more sophisticated epistemology:

> When I was a young player I thought only about technique, that things were very fixed, but I watched my father who coached a number of tour players including X. What he did was very different. It made me realise that there isn't just one system. It is all about the individual.

How does the EC operate?

As described above the coaches in this study demonstrate a sophisticated epistemology and view knowledge as fluid and the learning process as being situated in the learner. This is reflected in most instances by the coaches' attitude towards their players, in the learning environment and learning relationships cultivated, and in that they consciously try to create self reliant learners and autonomous decision makers. For example C5 notes his aim as being:

> Everyone's learning will be slightly different but it is about creating those self learners, those people that can make the decisions, decide and feel and hit the shots and performers that are a lot more skilled so that those skills will work in a pressure situation.

This altruistic view is matched by his colleagues. As C3 states:

> What I try to do is to get players to learn how to develop themselves, their games. And if you can get them to develop, then you are helping a player.

C2 directly links this aim to his own coaching philosophy:

> I think golf at the highest level changes so quickly that unless you have got the drive to constantly learn and develop yourself you are going to be behind very, very quickly. So I think that is a key and in terms of the philosophy that I and we try to instil in the players, I think it is very much about the same thing as a player, because I think each player also has the opportunity to develop their own programme, their own pathway. I think what we need to do is to give opportunities and options, and provide facilities and support where players can learn to develop themselves.

The willingness for players to trust their coach in order to embark on this educational journey is also described by coach C5 in his elite group work:

> With the X National Squad and with the lads we have on there, that has been a development programme, not just with the players but also with the parents, to trust in us and believe in what we are doing, to fully understand about the learning process and that relationship has evolved, has developed and continues to develop.

There are exceptions to this overarching learning philosophy however such as some players' desire for quick fixes, and more prescriptive forms of instruction. This cognitive dissonance in the coaching interaction appears though, to be a planned and acceptable mode of operation in specific circumstances. It does indeed create an incoherent chain but rather than this being the manifestation of a deeper belief of the need to dictate and manipulate players actions, which would lie well outside the acceptable boundaries of any form of EC of decision making, this is a managed process controlled and rationalised by the coach himself. As C2 explains:

> I think what we need to remember is that golf is also about here and now, and about being able to compete with what you've got on any given day, and there needs to be a balance of, … of attacking both their areas.

In this study's golf context the over-riding EC starts with a position of knowledge being available from many sources, fluid, and developing. Learning, though important for the coach is seen as located with, and as the responsibility of the player, with the coach taking the role of a guide or mentor. As such the coaches' purposely foster autonomous supportive environments and engage in coaching methods and practices that prodded and provided information to players how to make their own decisions. The player overtly becomes the focus of attention, owning the knowledge and directing the coach / player in their planning and reviewing process, thus determining and owning their own subjective measure of success, and ultimately determining their self-perception of performance.

Clear examples of the chain are described with the coaches' testimonies highlighting very strong linkages between their own sources of knowledge and experience and the learning episodes they seek to facilitate. Further 'downstream' linkages within the chain will now be highlighted in more detail. In order to facilitate player learning. A common theme is for the coaches to engage in autonomy-supportive behaviour in order to help develop self reliant decision makers. For example, the coaches in this study strongly believe:

> It is about teaching them and empowering them to make their own decisions. (….) I have a saying that "you can't phone a friend on the 18th fairway!" You need to trust yourself and trust that your basic concept will not let you down when you are under pressure (C 8).

C2 agrees and describes the role of a coach:

> To constantly remind and constantly encourage players to think for themselves, to think where do I go from here, how can I do it, who can help me and so forth.

A key element of this player development is the relationship and the behaviour of the coaches. C1 describes his own relationship with his players:

> I'm here as a support mechanism as well, you know we are a family. We work together. I'm always here for them. I'm always approachable. You've always got to be there for them. I'm always there for them twenty four-seven whenever they ring me, whenever they text me email me whatever……. When you have been with them for seven or eight years you build that type of relationship up. It is not just student client, it is like a marriage.

Another component used to locate the ownership of learning and performance in the player is the type of environment and methods used by the coaches. In particular the use of fun and enjoyment, and providing tools to aid players' self assessment and decision making. For example, C1 offers:

> You have always got to keep it fun. Because if you make it a fun environment, you are creating the right learning environment. If you are too strict and hard on people and not open and approachable, and not creating a good learning experience, and ultimately that is what people are coming to see you for, they are wanting to learn, they are wanting to improve. It has to be fun, it has to be.

Inextricably linked to the autonomy-supportive behaviour is the player centred focus of our coaches. For example C8 describes how he starts each of his sessions with his players:

> We just see how we are going and what the player feels he needs at that time. If a player hits a certain type of shot, he has a fade or a draw then I am not one for changing that. Play to your strengths and what you do well rather than develop a whole range of average shots.

C4 agrees and utilises this philosophy even when working with the national squads:

> Basically it is what suits the player. When you run a squad you can't have everyone doing the same thing, driving at the same time, hitting irons. It is about… what they need to work on.

How is the EC developed?

As noted the coaches interviewed had all completed their industry based formal training before embarking on their own personal journeys of discovery. The coaches view this form of knowledge accumulation as a valuable building block but also note its limitations and its potential detrimental effects. For example C5 describes the focus of his initial training with the PGA:

> The whole focus from the PGA, if I worked harder, concentrated on all the technical aspects, I would improve. You know it is in my DNA to think about the technical side of the game. It is how I have been brought up, what has been reinforced what I am conditioned to think and to believe. I'm not against the PGA per se but that body of knowledge, that stuff that being passed down, it is very difficult to break through those thoughts.

The sample highlights a greater need for coaches to share their experiences, to boldly go where no one has gone before and to learn from their own and others' mistakes as they have done, rather than simply replicating the models and techniques of others. C1 explains:

> When we first qualified we were taught the PGA way, that was how we had to teach, but you can't put everybody into the same box so then you have to go out and investigate different ways.

C2 describes the catalyst that opened his mind to a greater range of possibilities and the tipping point in his own career that led him down his path of discovery:

> I think that maybe early on there was a moment when I realised that what I was doing with my own game was going to a dead end, and I think when that moment came, that was a bit of a blunt moment, when I started to realise that there were an awful lot of doors that I had never looked behind. And I think that by just realising that I also understood that I needed to speak to a lot more people, that I needed to listen to a lot more, to various people's experiences, and also to start developing myself in a lot more areas. And I think sort of that since day it has been a constant journey.

C5 recounts similar frustrations about his game that led to his own enlightenment and illustrates a further point of how the coaches own epistemology is encapsulated in how they view not only their own learning but also the learning of others:

> Well when I was a player [the sources of knowledge] it was anywhere, it was tips, it was things that people would say, magazines, television, and analysts, absolutely everything. Eventually I realised that this wasn't the focus but it was all about learning, I've tried to read a lot about what the academic research says. I've been to a lot of the conferences, seminars, but ultimately it has all been about my own experience, trying things out, what has worked for me, what has helped me understand and then being able to pass that on.

This theme of experimentation is again supported by C3 in his statement:

> Whatever I learnt I tried out myself. I tried to make sure that whatever I believed or learned that I tried it out on myself. Whatever it was I would try it out so that I can say this is what it is, it works and I believe in it. And if I didn't try it out I didn't want to say try this because X says it works. I wanted to say it worked on me and it may work on you so try it out.

To summarise the coaches all recognise the initial benefit of their formal training but then pro-actively sought to widen their knowledge base. They recount their own complex and time consuming learning process and in response express a desire to guide their players and provide them direct and effective things to improve performance. Upon reflection they also note that they have been fortunate in their careers. They too have required a helping hand to accelerate their own learning and develop their professional practice and now they want to give something back to the

game. This guidance, mentoring and sharing is described by various coaches but most eloquently expressed by C4 who states:

> I would like to go into a role of coaching coaches, to be very much a mentor in coaching, what I have learned through the hard way really, pass it down. I just think that the coach has to search the knowledge but he has to sometimes know where to look. Sometimes he has to be assessed, to be sat down and asked where are your strengths and where can you improve?

Discussion

The study sought to uncover and articulate an EC within the sporting domain of elite golf coaching. Findings are discussed in relation to the three underlying aims of the study, namely does the EC exist, how does it operate, and how is it developed? The practical implications and future directions of EC research are then considered.

Answering the questions

First, evidence from this study that the EC does indeed exist in sport / golf, as in other domains, strengthens it as a conceptual framework against which we can reference the decision making practices of coaches. As noted by many authors the complex nature of coaching makes any linear process driven model ill advised. However the EC of coaches' decision making has utility as a tool to stimulate debate amongst practitioners in order for them to reflect upon and uncover a greater understanding of what drives their action. At each stage of the chain coaches are encouraged to look outside their narrow sphere of operation in order to explore a range of sources, methods, and behaviours that align to their deep held beliefs about knowledge and learning which may hitherto have been hidden deeply below the surface.

Secondly, all the coaches demonstrated clear linkages both up and down the EC. Where incoherence existed this was explained as well considered decisions focused on the overall "intention for impact" (Hill, 1992) rather than simply ad hoc actions (See Thorburn and Collins (2003) for a fuller examination of cognitive dissonance and practitioner decision making).

Not surprisingly the sample exhibited many characteristics previously espoused as indicators of high level coaching interactions. In particular all areas of Côté and Gilbert's (2009) definition of successful coaching practice, the interpersonal, intrapersonal and contextual factors, were clearly evident. Our coaches demonstrated an almost philanthropic "harmonious" passion for coaching (Lafreniere, Jowett, Vallerand, and Carbonneau, 2010). Their chosen methods of practice and behaviour were aligned closely to coaching models that place value on relationship

management (Jowett, 2007: Jowett, O'Broin and Palmer, 2010; Lerner, Fisher and Weinberg, 2000). They fostered high levels of autonomous – supportive behaviour as in Mageau and Vallerand's paradigm of athlete motivation (Mageau and Vallerand 2003), and their methods articulated closely to Kidman's athlete centred focus (Kidman 2001, 2005; see also MacGladley, Murray, and Hannon, 2010; and Lombardo, 1987). In most cases each coach's behaviour was linked directly up and down the chain in such a way as to mirror their own "sophisticated" epistemological stance.

Thirdly and finally what is evident from the testimonies of the coaches in this study was that despite all of them undertaking their industry's prescribed training (PGA Training Diploma, latterly the PGA Foundation Degree, and CPD) all of them have attained their position as coaches of elite players following extended periods of informal and non-formal learning episodes. These learning sources are indeed in line with recent evidence from Blomqvist, Hayrinen, and Hamalainen (2011) and their study of international level coaches' experiences of learning. (see also various studies on learning preferences of coaches: Vargas-Tonsing, 2007; Cushion, Armour and Jones, 2003; Nelson and Cushion,2006; Gilbert and Trudel, 2006; Erickson, Bruner and MacDonald, 2008; and Cushion *et al.,* 2010, for a comprehensive review of formal, informal, and non-formal learning).

Conclusion

Practical implications and future directions

From this group of participants the player centred EC rang loud through each of the interviews but how does this help us deliver a tangible outcome to golf and the wider sporting domain? Indeed how do we know that what the coaches say they do they actually do? What is the ultimate effect on performance and, if this is positive, how do we transfer this benefit and guide others in this process?

From this study's data it would appear that the EC is a powerful tool and plays a large part in the development of expertise, according to our questions, put to a number of top line golf coaches. What is not evident however is whether the EC is a causative or correlative factor, that is to say, has the coaches' EC made them good or did their EC result from operating at the top of the game? Interestingly in our study only one coach noted the effect that the external environment had had on him. The others all professed to have been in total control over their own destiny but to what extent are these statements based on accurate self-perception or biased self-presentations is still unknown. If we accept that the EC has merit in providing a framework to explore our participants' coaching expertise then it would seem sensible to teach this to novice and developing coaches also. A further area of

investigation would also be to uncover whether the clear EC exhibited by our participants is indeed a factor which distinguishes elite coaches in golf and other sporting domains.

We might also consider that, rather than exploring how our coaches accrued their knowledge, we should instead consider whether common traits exhibited that appear to determine a propensity to operate at this "elite" level. In our study the coaches demonstrated a clear attitude for continual improvement and a "growth mindset" (Dweck, 2004). We would argue however that the key trait described by each of the coaches was the willingness to experiment and reflect upon the outcome. This behaviour was first evidenced with professionals in the pioneering work of Schön (1983). This work on uncovering and gaining insight into how professionals think *in action* noted the crucial element of active experimentation and the reflection on its outcome. By comprehending such outcomes the professional is able to "reframe" the context and "clarify both the ends to be achieved and the possible means of achieving them" (Schön, 1983:41). Thus the professional engages in an ongoing process of framing and re-framing the situation in an attempt to understand and ultimately to change it. As such, the professional evaluates their experiment in reframing the situation on their perception of coherence, congruence, and the ability to keep the inquiry moving (Schön, 1983). Further work in the sporting domain to determine precisely which processes our coaches are adopting and their effectiveness would be invaluable to inform coach education.

In addition, looking at the quotes and attitudes presented in this study, it would be pertinent to examine those psychological characteristics for developing excellence in the coach in a similar way that MacNamara, Button, and Collins (2010) have of performers. In this way we might reveal what predisposes a successful coach to experiment, to be willing to fail and reflect, to consciously create a supportive, learning environment and ultimately make more correct decisions, more frequently than others. It is here that the exploration of their EC of decision making may be invaluable in joining the pieces together and collating a model of practice that can inform the coach development systems of the future.

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JQRSS: Acknowledgement Footnote

1. *Author's reflective comment:* This study allowed me to test my conceptual model of the Epistemological Chain in golf using a truly 'elite' sample of coaches. Using IPA for the first time as both a methodology and data collection method was a challenge but one which produced a very rich insight into the thoughts and actions of the participants. I would like to thank all those who gave up their valuable time and especially Dave for his guidance and support throughout.

2. *Author profile:* David Grecic has a background in sports coaching and sports management, and has a Master's degree, MBA and PGCE. He is currently in the final year of his PhD in Elite Golf Coaching Philosophy under the mentorship of Prof Dave Collins. David is the Director of the International Institute for Golf Education and has undertaken a review of England Golf's Talent Pool as part of his

related studies. He is currently using his research with the England and Scotland U16 junior squads where he is acting as a consultant to develop their talent pathways.

3. *Dear reader*, if this article has stimulated your thoughts and you wish to find out more about this topic the authors can be contacted on: David Grecic DGrecic1@uclan.ac.uk and Dave Collins DJCollins@uclan.ac.uk.

Reviewer 1 comments:
That so much primary data finds its way into this account is contextually refreshing and vibrant, telling us much of the characters being researched and their thoughts and feelings about knowledge creation in golf. It also tells the reader about the researcher and their desire to get closer to the lived experience, hence their choice for *Interpretive Phenomenological Analysis*. However, the claims for authenticity and closeness to reality in the methodology may be at odds with the data collection method; staged interviews alone. Interviews as a data collection method, whilst being appropriate for this study at this stage, are laden with research bias and a new means of observing reality seems to be indicated for this ongoing research. This would be an exciting development to follow up on. As said, interviews may be appropriate in the current report because the researcher could never have 'been there' to observe the things being inquired of the respondents, their thoughts and feelings of a disparate past, but he could be present to observe how those beliefs are put into action in the future, during coaching – some thoughts for future engagement perhaps. A good explanation of research activity and a hint of discovery being made from the data.

Reviewer 2 comments:
An interesting and insightful approach from elite coaches within the sporting world of golf. This collection of coaches who provide their thoughts upon their coaching and sporting knowledge is extremely valuable in a deprived area of literature. A method which has been used to probe individually further to obtain some rich data is arguably in the sporting context, of great value to readers. Yet, the collection of data itself may well have been better placed within the realms of these lived experiences when the senses are at their most effective to fully exploit this phenomenological approach to the data gathering. Instead, it seems more of a cognitive approach has been used for coaches to reflect on their experience, rather than accessing or re-living their experiences directly. Hence, the actual lived reality not being observed and gathered at its most poignant opportunity. Obviously, the researcher needs to 'get closer to the subject's perspective' but in order to get 'experientially close'; an enhanced approach to the methodological gathering of data is encouraged.