



CONTENTS

Graduate Perceptions of a UK University Based Coach Education Programme, and Impacts on Development and Employability/ **3**

David Turner University of Hertfordshire, UK

Lee J. Nelson Loughborough University, UK

Coaches' Efficacy Beliefs towards Working with Gay, Lesbian, and Bisexual Athletes/ **29**

Tiffanye M. Vargas-Tonsing and Sara B. Oswalt University of Texas at San Antonio, U.S.A.

The Influence of Basketball Dribbling on Repeated Sprints/ **43**

Yoav Meckel & Taly Casorla

Zinman College of Physical Education and Sport Sciences, Wingate Institute, Israel

Alon Eliakim

Child Health and Sport Center, Pediatric Department, Meir General Hospital, and Sackler School of Medicine, Tel-Aviv University, Israel

Coaches' satisfaction with their athletic partnerships/ **57**

Ross Lorimer University of Abertay, Dundee, UK

Reaction-Time Training for Elite Athletes: A Winning Formula for Champions/ **67**

Jin Wang Kennesaw State University, U.S.A.

Current Issue In Coaching

Authenticity in formal coach education: Online postgraduate studies in sports coaching at The University of Queensland/ **79**

Clifford J. Mallett & Sue Dickens University of Queensland, Australia

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Graduate Perceptions of a UK University Based Coach Education Programme, and Impacts on Development and Employability

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Abstract

This investigation explored graduates' perceptions and experiences of a Higher Education (HE) coach education programme. It aimed to identify if this formal learning source had impacted upon attendees' development and employability, while uncovering information to potentially inform future provision. 10 graduate coaches who had completed coaching modules at a United Kingdom (UK) HE institution participated in in-depth semi-structured interviews. Graduate coaches highlighted a positive educational experience that developed critical analytical skills, assisted in their perceived accelerated development, and enhanced employability. Using Carl Rogers' work as a framework to analyse the data, it is demonstrated that the findings collectively offer implicit support for the adoption of a person-centred educational philosophy. Further research and debate is identified as necessary to ascertain whether the person-centred approach offers a legitimate and effective alternative form of coach education.

Keywords: coach learning, higher education, person-centred approach

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Introduction

A desire to professionalise coaching has ignited substantial contemporary interest in coach education (Lyle, 2007; Trudel & Gilbert, 2006), driven by an increased demand for qualified coaches (McCullick, Belcher & Schempp, 2005), and greater accountability regarding appropriate vocational coaching standards (Gilbert & Trudel, 1999). This has resulted in broader opportunities to access coach education programmes, which have attained a heightened profile (Cassidy & Rossi, 2006), founded upon the notion that well educated coaches are more likely to be successful in practice (Hammond & Perry, 2005). Consequently, there has been a recent explosion in associated literature concerning the optimisation of how coaches learn (Côté, 2006).

Coach learning research frequently indicates that the acquisition of knowledge and practice is a complex process requiring the pursuit of individualised and invariably ad-hoc developmental pathways (Cushion, Armour, & Jones, 2003). The development of coaches has therefore been described as both idiosyncratic and serendipitous (Abrahams, Collins, & Martindale, 2006; Nelson, Cushion & Potrac, 2006; Werthner & Trudel, 2006).

According to Nelson et al.'s (2006) conceptual framework, coach learning occurs in formal (e.g., NGB awards, HE courses), non-formal (e.g., conferences, workshops), and informal (e.g., coaching experience) situations. Research in the domain of coach learning has frequently suggested that formal coach education has been a relatively low impact enterprise when compared to informal experiential learning (Gould, Gianinni, Krane, & Hodge, 1990; Irwin et al., 2004; Jones et al., 2003, 2004; Schempp et al., 1998). This might however be unsurprising when one acknowledges that the total duration of time spent engaged within formal courses will inevitably be negligible in comparison to practical field experiences (Gilbert, Côté, & Mallett, 2006). Nonetheless, formal coach education remains a vehicle through which the standards of coaching provision could potentially be enhanced and as such is recognised as a promising means through which to professionalise sports coaching (Cassidy, Jones, & Potrac, 2004; Lyle, 2002, 2007; Jones & Turner, 2006).

Central to formalised vocational preparation have been the national governing body (NGB) coaching awards. These are sports specific coach education courses, operated at various levels (e.g., assistant coach, club coach, advanced coach) by organisations representing particular sports within a specified country (e.g., English Volleyball Association), with attainment indicating a certain level of technical competence, and standard of instructional ability. NGB's have understandably received considerable attention given the need for certification and quality assurance of coaching practitioners (Knowles, Borrie & Telfer, 2005).

Although NGB courses are undoubtedly an important learning avenue, it would appear that coaches have had, and value, other formal opportunities available to them (Nelson et al., 2006).

For example, over the past decade there have been an increasing number of higher education (HE) (i.e., academic context within which diplomas and degrees are usually studied at undergraduate and postgraduate levels, by adult learners, in colleges or universities) institutions offering academic courses, focusing on the study of sports coaching. Lyle (2002) reported that 26 institutions were offering such courses by 2001, a figure that has since grown further due to an increasing trend towards the provision of sports coaching courses at British universities (Jones, 2005). Indeed, 245 UK HE level courses with sports coaching in the title were due to start in 2009 (UCAS, 2009).

This increase in HE course provision is arguably the result of a growing appreciation of coaching as a legitimate research area, and the role being acknowledged as akin to that of an educator, and hence an intellectual endeavour requiring practitioners who are capable of engaging in complex socio-cultural processes (Cushion et al., 2003; Jones & Turner, 2006). The establishment of such courses has therefore been identified as a potentially useful development that presents coaches with the opportunity to engage in broad and extended study (Jones, Armour, & Potrac, 2004). Despite this, there has been little critical consideration of sports coaching degrees in academic literature in terms of content, delivery or assessment (Nelson et al., 2006). Moreover, there is little appreciation of who has typically undertaken these awards, nor how these have impacted upon coaches' development.

In an attempt to address the above shortcomings, this exploratory study had two main aims. First, to present graduates' personal accounts of a university-based coach education programme, in recognition towards the importance of gathering coach learners' perceptions of their educational experiences (McCullick et al., 2005). Second, to consider how these findings could inform the future delivery of such courses. In doing so, we contend that the importance of this research lies in the provision of a theoretically informed empirical account that contributes towards what has been identified as an under researched component of the coach learning literature (Nelson et al., 2006).

Methodology

Participants

Adopting an instrumental case study approach, participants were selected utilising purposive sampling to ensure that data gathered were specific to the given research area (Patton, 2002). Approaches were therefore made to graduates who had undertaken the coaching module pathway (i.e., the 4 successive modules shown in Table 1), as part of sports related degrees, studied at a

particular United Kingdom based university, between 2000 and 2005. These years were selected, as during this period the same lecturer was responsible for the coaching pathway and delivered most sessions to the same curriculum design, ensuring a large degree of equivalence of experience among students.

The sample of coaches was recruited by sending an invitation to all students who had completed the *Advanced Coaching Study and Skills* module, and subsequently been awarded their degree, during the above period. Since the other coaching pathway modules were prerequisites for the *Advanced* module, this ensured that participants had studied all of the coaching modules available. Ten respondents agreed to participate.

Participants were 9 male and 1 female volunteers. Ages ranged from 22 to 41 years, with an overall mean age of 26. Coaching experience prior to undertaking the coaching module pathway ranged from a few hours of informal participation coaching to several years of performance coaching (See Table 2).

Course Programme Details

The coaching module pathway was typically 3 years in overall duration, and featured two modules at Level 1 (*Introduction to Coaching Study and Skills* and *Coaching Practice*), one module at Level 2 (*Developing Coaching Study and Skills*), and one module at Level 3 (*Advanced Coaching Study and Skills*). Typical contact hours per module were 20 hours of lectures, 13 hours of tutorials/workshops, and 6 of practicals. A concise module outline, typical content, and assessment methods, are provided in Table 1.

Table 1. Module Outlines, Typical Content, and Assessment Methods

Module	Outline	Typical content	Assessment methods
Introduction to Coaching Study and Skills (Level 1)	Examination of basic rationale behind principles of coaching; with reference to relevant research/literature.	The Coaching Process Coaching Styles	Coaching Principles Assignment - ethical behaviour - safe practice - dealing with emergencies/injury - effective coach-athlete relationships
	Put into context by practical experience of 15 hours of coach shadowing placement.	Coaching Safely Coaching Children/Disabled Sportspeople	Coach Shadowing Assignment - general description - selected session plans - critical review of sessions - reflection upon learning experience - evidence of 15 hours coach shadowing
	Introduce novice coach to a range of relevant topics that inform coaching process in early stages.	Reflective Practice	

Coaching Practice (Level 1)	Develop practical coaching abilities through gaining leadership level coaching qualification, and undertaking practical planning, delivery, evaluation.	The Active Body	Job Advertisement - prepare job advert/description for a coach - provide justification and rationale, with reference to relevant theory and literature - evidence of NGB coaching award at leaders level Coaching Practice Assignment - plans for 6 coaching sessions - plans in more detail for 2 sessions - 2 sessions delivered, evaluated, and confirmation by a qualified coach. - reflection on learning
	Examination of basic rationale behind practical application of coaching practices, and planning; with reference to relevant research/literature.	Technique Improvement	
		Practical Planning Principles	
	Introduce novice coach to range of relevant topics that inform coaching practice in early stages.	Basic Psychology	
Developing Coaching Study and Skills (Level 2)	Examination of key strategies, issues, and theories that relate to the further development of successful coaching skills.	All-Time Greats Philosophy/Methods	Written Report - critical assessment of coaching practices - practical application of fitness and performance analysis - periodised coaching plan produced Practical Coaching Portfolio - goal setting process - general description/ highlighted examples - evidence of 15 hours coaching undertaken - critical evaluation of programme and coaching - reflection upon learning - evidence of further coaching qualification
	Complement work towards a national governing body coaching award (at above leaders' level or equivalent), and includes 15 hours of logged coaching.	Communications Skills	
		Learning Theories and Motivation	
		Self-Management, & Developing Prof Relationships	
Advanced Coaching Study and Skills (Level 3)	Critical appraisal of advanced sports coaching theory, and personal development, as applied to own coaching context/specialised interests.	Goal-Setting and Periodisation	Coaching Theory Assignment - problem coaching scenarios - specialised study of 2 specific sub-discipline areas - evidence of CPD Coaching Practice Assignment - evidence of 15 hours of practical coaching - planning, delivery and evaluation of 6 week coaching programme - case study of 2 participating athletes - critical reflection on coaching progress
	Gain a further national governing body award. Undertake a further 15 hours of logged coaching.	Performance Analysis	
		Coaching Research - Trends and Ideas	
		Current Issues	
		Sub-Discipline Specialised Topics	
		Problem Coaching Scenarios/Decision Making	
		Coach Education	
		Coaching Effectiveness	

The curriculum content broadly covered generic coaching theory related to associated sub-disciplines, allied theoretical frameworks, critical narrative descriptions of expert coaches, and

applied implications for coaching practice. A variety of teaching methods were employed, from traditional didactic lectures to facilitated group discussions and use of problem solving scenarios, but always with an emphasis on active and interactive learning, and the frequent use of illustrative examples to link theory and practice. Assessment comprised entirely of extended written assignments centred upon theory based critical questions, tasks, specialised studies, and critical write-ups of individualised experiential learning from practical coaching environments. These modules were studied as part of several possible honours degree programmes. Participants in the present study were graduates of Coaching Science BSc Hons (n = 8) and Sport & Exercise Science BSc Hons (n = 2) courses.

Data Collection

An interpretive research design was employed in the present study to elucidate the perspectives, interpretations, and beliefs of the participants in regards to their educational experience. As Jones and Gratton (2004) indicated, such an approach can be facilitative in interrogating the *how* and *why* of dynamic human realities, and deepening our understanding of related experiential and contextual influences. Furthermore, the qualitative inductive methodologies and emergent potentialities characteristic of such a design (Patton, 2002) are deemed well suited to gaining insight in areas of research where little is currently firmly established (Strean, 1998).

One-to-one, in-depth, semi-structured interviews were utilised to gather data. Interview questions were open ended, such that respondents were invited to explore certain aspects with the interviewer in a reflexive manner (Sparkes, 2002), and were not guided or compelled to respond in a certain way (see Appendix A – Interview Questions). Interviews were conducted at a location and time convenient to each graduate coach, and lasted between 50 and 70 minutes. Interviewees were reminded at the outset of confidentiality issues, their right to withdraw at any time, and that no right or wrong answers were expected. Prior to interview, each participant was required to provide informed consent.

An interview guide was constructed that was informed by previous coach education research, plus the broader educational literature, and designed to ensure that the aims of the study were met. The interview questions followed an identical sequence, plus were designed to be clear and included language likely to be familiar to participants (Patton, 2002). The main areas covered within the interview guide were demographic data, motivations, course content, delivery, assessment, and impact. Where necessary the interviewer took appropriate opportunities to seek clarification and utilised probes to gather further detail by asking the interviewee to elaborate on points (Gratton & Jones, 2004). Each interview was taped, and

then transcribed verbatim, with only minor grammatical changes made that did not distort content meaning.

Data Analysis

The first author repeatedly read all transcripts in order to gain an overall sense of familiarity with the general content. Consistent with previous coach learning literature (Bloom, Durand-Bush, Schinke, & Salmela, 1998; Irwin et al., 2004; Knowles et al., 2006; Wiersma & Sherman, 2005), inductive content analysis was then employed, which allowed organised themes to emerge from the unstructured interview data.

Interview texts were first separated into distinct segments of information labelled meaning units, comprising of a single concept or idea able to stand on its own. Meaning units were then tagged according to the content involved. All identified tags were next listed and compared for similarities and differences, with meaning units exhibiting analogous tags being reorganised into broader categories referred to as lower order themes. In a similar process, lower order themes were then compared and contrasted so that those relating to similar issues could form higher order themes. A final level of analysis was then applied by grouping the higher order themes into two general dimensions.

Two hundred and fifty-two meaning units were identified as being both coherent and relevant to the area of investigation. The content analysis process resulted in the emergence of two general dimensions, five higher order themes, and twelve lower order themes. The titles of these themes, the number of meaning units pertaining to each, the hierarchical relationships between them, and which participants' meaning units contributed to each theme, are illustrated in Figures 1 and 2.

In order to better understand these findings our interpretation of the data was informed and shaped by Carl Rogers (1951; 1969) theory of person-centred education. It has been demonstrated that Rogers' theory may represent a useful framework for making sense of practitioners' perceptions and experiences of coach education (Nelson, 2009). This appeared to present an appropriate analytical framework as the findings implicitly endorsed the adoption of a person-centred philosophy. Indeed, graduate perceptions and experiences of not only the positive aspects of the course, but also their suggestions for enhancing less favourable elements, seemed to support the approach advocated by this theoretical alternative. Thus person-centred theory authentically offered an appropriate means of interpreting the outcomes.

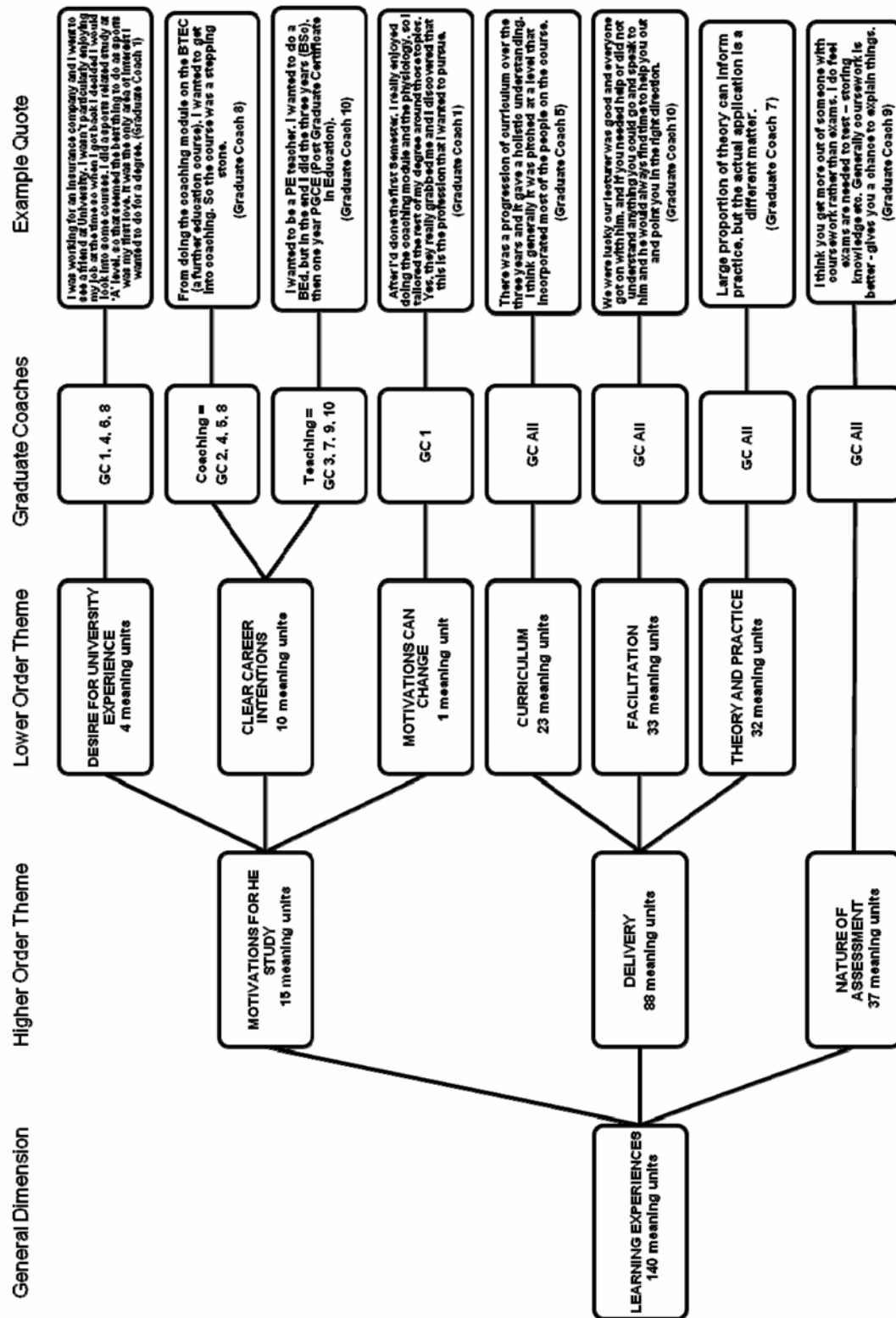


Figure 1. Themes, meaning units, and hierarchical relationships for general dimension of *Learning Experiences*.

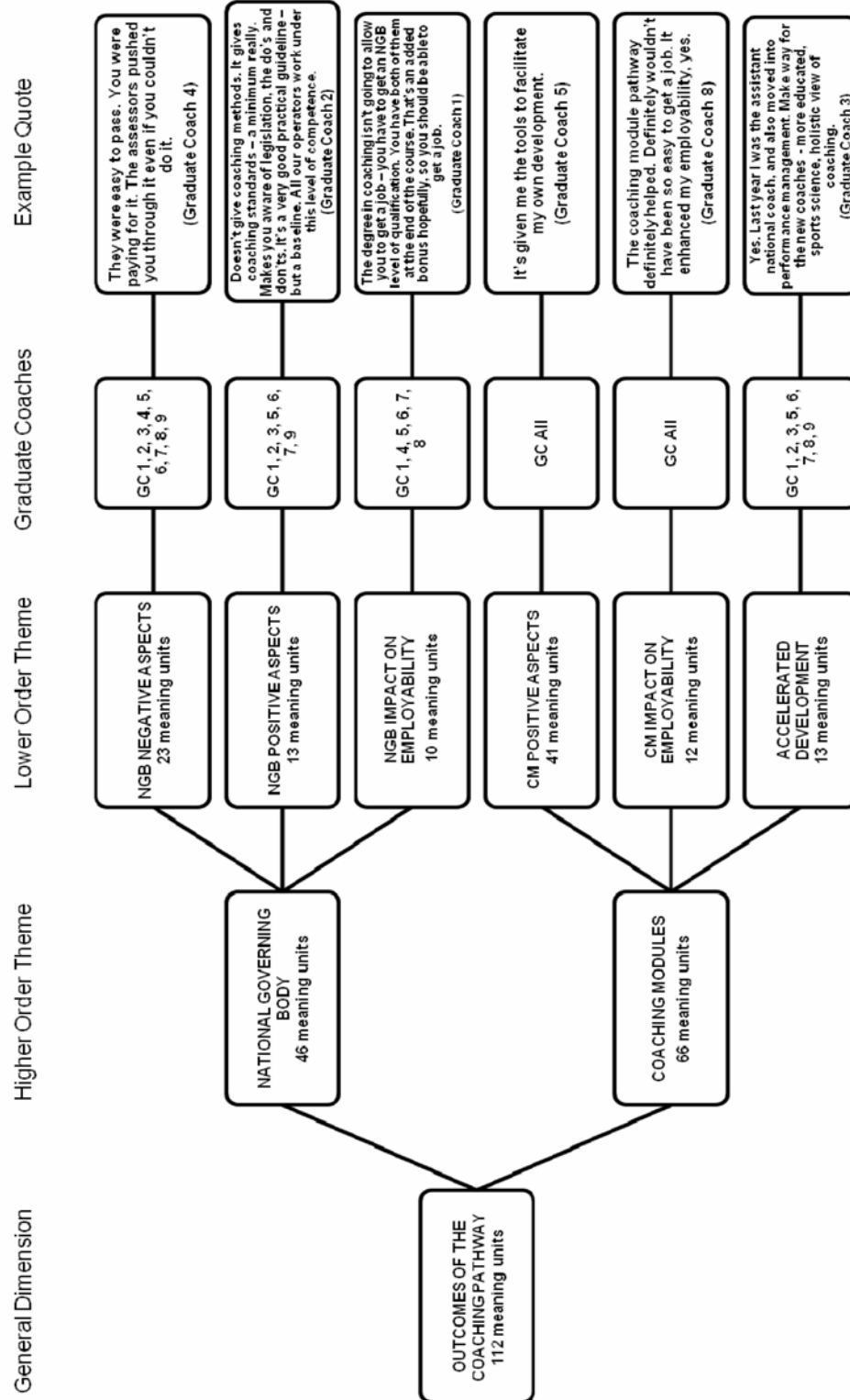


Figure 2. Themes, meaning units, and hierarchical relationships for general dimension of *Outcomes of the Coaching Pathway*.

Credibility & Transferability

Methodological guidelines from Lincoln and Guba (1985) and Patton (2002) were followed in attempting to ensure credibility (i.e., that findings are trustworthy, believable, and reflect real experiences), and transferability (i.e., that findings have broader possible applications, and are perceived as illustrative of shared realities). For example, credibility was enhanced by only one interviewer being employed throughout, who was trained in qualitative research methods, had studied coaching within HE, was knowledgeable within coach education, and was a qualified active coach. Saturation of data relating to specific issues during the interviews was promoted via probing techniques and was more generally achieved when no new findings were uncovered by subsequent interviews. Member checking was employed by sending each participant a copy of their transcribed interview to comment upon (no corrections or elaborations were however received). An organised trail of records was maintained and an audit of these records was undertaken by a third academic with extensive experience in sport related research. This helped ensure that the study was managed and conducted appropriately. In regards to transferability, rich thick description (Cresswell, 1998) was employed in order to illustrate participants' experiences in a narrative approach, utilising key quotes to allow the reader to make their own generalisations to related settings.

Results

Analysis of the results revealed two general dimensions relating to the graduates' *Learning Experiences* (see Figure 1) and the perceived *Outcomes of the Coaching Pathway* (see Figure 2), both of which will now be further explored.

Learning Experience

Motivations for HE Study

Four graduate coaches indicated that a general passion for sport and a desire for the university experience was part of their initial motivation to enter the programme. But most did express clear career aspirations, which divided equally between those wishing to become coaches or to develop their coaching, and others desiring to become teachers of Physical Education.

I was working for an insurance company and I went to see a friend at University. I wasn't particularly enjoying my job at the time so when I got back I decided I would look into some courses. I did a sports related study at 'A' level, so that seemed to be the best thing to do as sports was my first love. It was the only area of interest that I wanted to do for a degree.

(Graduate Coach 1)

I was coaching first ... when I retired as an athlete I wanted to improve my coaching, so I went to university to do the coaching units. (Graduate Coach 2)

While Coach 1 indicated above that his initial motivations were not specifically vocationally focused, the following quote demonstrates that motives can alter during the course.

After I'd done the first Semester, I really enjoyed doing the coaching module and the physiology, so I tailored the rest of my degree around those topics. Yes, they really grabbed me and I discovered that this is the profession that I wanted to peruse. (Graduate Coach 1)

Course Delivery

There was a mixture of positive and negative comments as regards the curriculum. The graduate coaches highlighted that the content was generally delivered at an appropriate standard for their needs, promoted a broad understanding of coaching, and provided sufficient opportunities to apply knowledge acquired to examples from their own sporting context.

There was a progression of curriculum over the three years and it gave a holistic understanding. I think generally it was pitched at a level that incorporated most of the people on the course. (Graduate Coach 5)

I was constantly applying things I learnt to my sport. If I was doing something already in my coaching, it helped me understand it more. (Graduate Coach 8)

However, some comments indicated that the content was largely tutor driven, and that the coach educator might have better utilised student input in order for the curriculum content to be tailored more towards individual needs.

Quite heavily driven by the tutor ... perhaps there could be more room for the students to have an input. (Graduate Coach 4)

Perhaps it could be tailored more towards the individual needs of students ... make a curriculum based around their wants, needs, desires ... and how it would optimise their development and take into account strengths and weaknesses. (Graduate Coach 6)

Irrespective of this shortcoming, the course was favourably reflected upon with the educator highlighted as having contributed towards the graduate coaches having had a positive experience. More specifically, the coach educator was identified as having qualities, such as enthusiasm, applying practical examples to theory, and building relationships, which were seen as adding

value to the graduate coaches learning experience.

He coaches when he teaches you. I found his enthusiasm motivating ... it is not all about the course – he was the right person for the course. (Graduate Coach 3)

He tried to draw holistically on how this informs coaching, because he took the theory and put an applied slant on it and informed your coaching practice. (Graduate Coach 7)

The manner in which learning was facilitated may be best summarised as creating dialogue, with graduate coaches indicating that they highly valued learning from their peers, within small group situations, and through the provision of one-to-one support.

Small groups are a lot better, and the lecturer would make sure the stuff was going in, getting the whole class involved in giving ideas and answering questions. (Graduate Coach 2)

It was a kind of democracy by the time we left – we were involved in what we were learning as much as the tutor was. (Graduate Coach 3)

We were lucky our lecturer was good and everyone got on with him, and if you needed help or did not understand anything you could go and speak to him and he would always find time to help you out and point you in the right direction. (Graduate Coach 10)

A by-product of this facilitative process was that the coach educator seemed able to build strong and positive relationships, based upon the perception that he was approachable and available. This resulted in the establishment of informal mentoring relationships in at least two cases, which developed organically and persisted post-course: ‘Even now [the coach educator] mentors me – we exchange e-mails. I explain my frustrations about NGB stuff. He gives me good advice’ (Graduate Coach 3).

The graduate coaches expressed the need for a direct link between theory and practice within the delivery to promote understanding. They also recognised that knowledge and experience interact and need to be balanced in terms of development. Despite recognition that theory was illustrated with practical examples in the classroom, some graduate coaches desired more opportunities to see or experience theory applied in practice.

Sometimes education can be detached from the practical side, but there needs to be that link so people can make their understanding between the two. (Graduate Coach 1)

Lessons were all very classroom based. No room to put your skills into practice. (Graduate Coach 9)

So it would appear important that coach educators strive to include practical coaching

opportunities to supplement and support learning that takes place within the classroom.

Nature of Assessment

Notwithstanding the fact that there were no examinations associated directly with the coaching modules, the graduate coaches were keen to highlight the unpopularity of exams undertaken in other modules as part of their degree programme, and expressed the opinion that written assignments were more appropriate.

I think you get more out of someone with coursework rather than exams. I do feel exams are needed to test – storing knowledge etc. Generally coursework is better - gives you a chance to explain things. (Graduate Coach 9)

The assignments associated with the coaching modules involved, amongst other things, the writing up and evidencing of practical coaching experiences. The graduate coaches inferred that they valued such assessment relating to, and giving credit for, practical experiences, because it allowed assessment individualised to different coaching contexts, provided flexibility in choice of focus, and promoted reflection that facilitated the theory and practice link.

The assignment was set up so you had to document what you had done at your workplace, and why you had taken that approach. With the idea being that you provide theory to back up your behaviours, to provide an understanding to the reader, and also to get engaged in reflection. So anything you could improve - how could you do that? You are drawing on theory - why you might approach it differently next time. (Graduate Coach 4)

For me the assessment was on the right lines. It allowed you to think about your delivery, so it made it specific to your context. It is essential assessment is related to your own practice, and your coaching context, and it did that. (Graduate Coach 8)

Although the graduate coaches valued the assessment methods used some felt that having the tutor practically assess their coaching performance, and provide specific feedback, could have enhanced the assessments.

Could do with some more practical, and maybe get the lecturer to actually watch you so they could assess us. (Graduate Coach 2)

It could be enhanced slightly by engaging in coaching with a group of in-house athletes, in which you could get feedback on site – how to deal with scenarios. (Graduate Coach 9)

When considering this finding, in light of those already presented, it becomes apparent that the graduate coaches wanted practical opportunities to be at the heart of their learning experience.

Having outlined data pertaining to the graduate coaches thoughts about the course, we will now present findings in relation to their perceptions of its impact.

Outcomes of Coaching Pathway

National Governing Body Awards

Students were compelled to gain NGB coaching awards as part of the requirements for the coaching modules. Some graduate coaches expressed negative opinions in relation to the NGB courses. These included insufficient time to adequately cover theoretical underpinning concepts (i.e., the why), a lack of appropriate focus in relation to the novice coaches' needs, the issue that some awards were very easy to attain, and the additional burden of cost on top of academic expenses.

They were easy to pass. You were paying for it. The assessors pushed you through it even if you couldn't do it. (Graduate Coach 4)

Only so much information can be delivered on a week or weekend course – you skim over a lot. (Graduate Coach 8)

The positive aspects of NGB awards identified were that they provided sports specific knowledge and understanding, through the provision of drills and practices with which to enhance techniques and tactics. The following quote illustrates that NGB awards were seen as a useful source for the attainment of a practical baseline of coaching competence.

Doesn't give coaching methods. It gives coaching standards – a minimum really. Makes you aware of legislation, the do's and don'ts. It's a very good practical guideline – but a baseline. All our operators work under this level of competence. (Graduate Coach 2)

Despite many of the earlier reported negative aspects, the majority of the graduate coaches recognised that the attainment of NGB awards was essential, as these, unlike the university degree, are considered to be an industry standard of coach licensing accreditation.

The degree in coaching isn't going to allow you to get a job – you have to get an NGB level of qualification. You have both of them at the end of the course. That's an added bonus hopefully, so you should be able to get a job. (Graduate Coach 1)

So it would appear that irrespective of the shortcoming identified, these practitioners saw the attendance of NGB courses as being a necessary element of their professional preparation and development.

Coaching Modules

In contrast to the NGB awards, the graduate coaches considered that the coaching modules were more demanding, largely because they critically analysed issues in greater depth (i.e. addressed the why). The modules also were perceived to have provided them with transferable skills, including reflective practice, with which to promote further professional growth. Overall the coaching module pathway was thought to have enhanced both coaching practice and critical self-awareness.

I understand a lot more about what I do now. I can understand the theory – when they (athletes) say ‘why’ I can explain. Before I couldn’t do that. (Graduate Coach 4)

It’s given me the tools to facilitate my own development. (Graduate Coach 5)

Although the NGB awards were earlier identified as the required industry standard necessary for employment, having undertaken the coaching module pathway was perceived by the graduate coaches to be a benefit in regards to employability.

The coaching module pathway definitely helped. Definitely wouldn’t have been so easy to get a job. It enhanced my employability, yes. (Graduate Coach 8)

It’s quite a difficult industry to break into at first. Helpful to have a degree. (Graduate Coach 5).

There were also indications that the coaching module pathway may have had more of a holistic impact upon the growth and development of some individuals, reflecting earlier comments regarding broad transferability of learning.

It also impacted on other areas of my life. Coaching methods applied to other scenarios. Even though I went into an area other than coaching I still think there was stuff I learnt at university that helped me. (Graduate Coach 10)

When questioned as to whether they perceived that the coaching module pathway had accelerated their coaching development, the graduate coaches overwhelmingly responded positively. However, the added value was more apparent in differential emphases (i.e., in relation to coaching practice, coaching knowledge, or coaching status).

Definitely added value. The knowledge – the way I coach. I am better now than when I started. I have gained a lot of experience through University – the hours, and seeing other situations, and talking to other coaches about how to get around problems. (Graduate Coach 2)

Yes. Last year I was the assistant national coach, and also moved into performance management.
Make way for the new coaches - more educated, sports science, holistic view of coaching.
(Graduate Coach 3)

Discussion

To date there has been a dearth of research into HE coach education, hence there is little understanding about who attends these courses, the reasons for enrolling, perceptions about content and delivery, and what impact, if any, attendance has on coaching development and the gaining of employment. The present study, therefore, aimed to begin addressing these issues through an exploratory, empirically based, investigation.

The majority of graduate coaches in the present study were initially motivated to undertake the coaching module pathway because they had clear career intentions. This finding might be best understood in terms of the ‘actualising tendency’, which Rogers (1977) theoretically conceptualised as the central source of energy driving all human behaviour. In light of this, it could be suggested that these individuals, having identified a desirable career, were internally driven to pursue learning that could form either part of their professional preparation or ongoing development. An internal desire to achieve their goal, and actualise their potential, therefore offers a possible explanation for their having enrolled onto the coaching module pathway. The cohort, however, exhibited different developmental emphases based upon diverse intended career destinations, encompassing performance and participation coaching contexts, as well as physical education teaching environments.

Some individuals expressed less career-focused reasons for undertaking extended HE study, such as a broad desire for the university experience or a generalised interest in sport. Such vocational uncertainty is perhaps unsurprising given that an increased proportion of the UK population are now undertaking university study as a result of government drives to widen and increase HE participation (Fallows & Steven, 2000). Nonetheless, we should conceivably not lose sight of opportunities for personal growth and eventual vocational engagement through being educated in an area of generalised interest.

The curriculum content of the HE programme under investigation might be best described as principally tutor driven with a standardised syllabus being delivered to all students. Whereas the majority of participant coaches reflected fairly positively on the courses’ content, a proportion of the graduates desired greater input such that the subject matter would be tailored more to individuals’ needs. This finding reflects the difficulties associated with designing a syllabus that caters for the diverse motives, previous experiences, and intended vocational

destinations that are inherent in such a group. Indeed, the dangers of a purely tutor driven curriculum would appear to include covering topics that students are already familiar with, issues not directly relevant to individuals specific context, and learners not being able to exercise personal agency in prioritising areas of development (Gilbert & Trudel, 1999; Irwin et al., 2004; Jones et al., 2004).

Such a finding is inline with Rogers' (1969) belief that 'significant learning takes place when the subject matter is perceived by the student as having relevance for his own purposes' (p. 158). Although a coaching specific programme will inevitably have a degree of relevancy, this will of course be constrained by those factors already identified. The usefulness of any such programme, then, would seem to be dependent upon the educator's ability to cater for the inherent heterogeneity of its learners. In light of such issues, Rogers (1969) was of the opinion that course content, rather than being principally tutor drive, should be built around the individual and group purposes of its members. Person-centred theory would therefore appear to offer an alternative means of ensuring that coach education courses could meet the specific wants and needs of its group members.

Notwithstanding these negative comments, the graduate coaches did express positive satisfaction with regards to content progression, appropriateness for level of study, and provision of a broad overview of coaching. Furthermore, the course, although understandably predominantly theoretical in nature, was perceived by participants to effectively promote understanding, as it was easily related to practical coaching settings. It would as such appear that the educator, in this instance, managed to cover topics and present material that was considered by the students to be relevant. The effectiveness of the course was perhaps therefore largely attributable to the skills and qualities of the educator who designed and delivered it.

The graduate participants identified the coach educator as an important and positive influence upon their learning. The educator tapped into the coaches' own understandings and experiences, and fostered the peer sharing of information, practices, and knowledge by utilising questioning, stimulating group discussion, and drawing out illustrative examples. The graduate coaches in the present study highlighted a preference for this teaching style, offering further support to the finding that coach learners highly value opportunities to discuss issues and share experiences with other coaches during coach education episodes (Cassidy, Potrac & McKenzie, 2006; Culver & Trudel, 2006; Knowles et al., 2001; Wiersma & Sherman, 2005). The facilitative approach utilised by the coach educator was therefore in line with person-centred theory (Rogers, 1969), and presents evidence towards this being a valuable means of fostering effective coach learning environments.

Although the graduates appreciated the tutors' facilitative approach in the classroom, they did highlight the need for a greater direct link between theory and actual practice. Discussion of

practical examples in the classroom alone was not perceived as sufficient. The coach learners in the present study, as per McCullick and colleagues (2002, 2005), wanted opportunities to actually see the coach educator model behaviours by directly applying theory in a practical context. This finding can be further understood through Gusky's (2002) model of teacher change, which proposes that teachers' attitudes and beliefs are ultimately shaped by the experience of seeing knowledge successfully implemented within practice. This finding is also consistent with Rogers (1951) belief that observations are "exceedingly important resources" that present valuable learning opportunities and his suggesting that practical experiences should lie at the heart of professional education (p. 465).

There has to-date been relatively little discussion about the assessment of coaches. In the present context coaches were presented with flexible assignment briefs that allowed the learners freedom to concentrate on pertinent aspects of direct relevance to their own development. The flexible nature of the assessment criteria was therefore compatible with a person-centred educational approach (Mearns, 1997). Moreover, by awarding academic credit for supervised real world experiences, and having learners critically reflect upon practical episodes within their own coaching context, the assessment strategy offered an attempt to address the recent call for having learners critically reflect upon practical episodes within their own coaching context (Cassidy et al., 2004; Cushion et al., 2003; Gilbert & Trudel, 2006). Encouragingly, the participants' comments demonstrated that they valued this type of assessment and recognised the vocationally related worth of this approach over examinations.

Notwithstanding that the coaches appreciated the individualised nature of assessments, they did stress a desire for the coach educator to have critically analysed their coaching practice in context. Previous research has demonstrated that coach learners desire the opportunity to apply knowledge in a practical coaching scenario under the guidance of an educator who provides constructive feedback (Hammond & Perry, 2005; McCullick et al., 2005). A desire for individualised feedback is of course understandable as coaches are rarely presented with opportunities to gather information that could specifically inform their ongoing development. While Rogers (1969) recognised the value of feedback gained from others, he was also of the opinion that students should primarily evaluate the quality of their learning themselves. Self-assessment has been shown to form an important part of the experiential learning process that model coaches engage in, so it would seem important that coaches develop the skills associated with this process (Gilbert & Trudel, 2001). While feedback from other practitioners was wanted, and would often be useful, it is also important that assessment, in its purest sense, does not act as a 'straight jacket' causing the social reproduction of practices at the expense of meaningful reflection.

Evidencing the attainment of NGB coaching awards was a compulsory condition for

fulfilling the programme requirements. Coaching graduates were consequently in a well informed position to comment on the similarities and contrasts between their educational experiences of formal coach education, as offered by NGBs, and that based at a HE institution. According to the participants in the present study, NGB awards largely concentrated on the what and the how of sports coaching, by providing attendees with a practical toolbox of sports specific drills and practices; a finding compatible with previous suggestions (e.g., Abraham & Collins, 1998). The university based coaching modules, on the other hand, were described as presenting the why of coaching through critical exploration of theoretical concepts to evaluate and underpin evidence based coaching practice. These findings further support the notion that NGB coaching courses might be more appropriately labelled training as opposed to genuinely educational endeavours (Nelson et al., 2006). NGB and HE coach education programmes certainly seem to feature surface and deep learning characteristics respectively (Entwhistle, 1981).

Despite criticising NGB awards for being perceived as intellectually undemanding and somewhat easy to pass, the graduate coaches did stress that these were able to provide tactical and technical awareness, plus a battery of practical drills, that facilitated their ability to become more involved in the practical coaching of sport. The NGB awards therefore appeared to supplement theoretical knowledge acquired through the university programme by providing students with an understanding of sport-specific issues. Although criticisms of NGB awards should not be ignored, it is worth noting that these courses remain the most important formal source of sport-specific knowledge, which is a key strand in the development of the knowledge structure of expert coaches (Abraham et al., 2006).

Those attending any university level generic coach education course would still thus be obliged to also undertake NGB awards, in order to not only become officially accredited, but to acquire essential underpinning sport-specific understanding. The graduate coaches in the present study therefore appeared to benefit from simultaneous engagement with both formal learning avenues. They not only felt that they collectively provided a greater breadth and depth of knowledge, but suggested that gaining both qualifications resulted in a whole package which contributed towards enhanced employability. Participants, however, specifically stressed the importance of acquiring NGB coaching awards, acknowledging that these are essential for gaining employment since they represent recognised industry standards. Despite this they did feel that the acquisition of a coaching related degree might help them to distinctively 'stand-out' in the job market above other coaching practitioners possessing only NGB awards. A pertinent critical question however relates to how fully employers truly understand the nature and value of coaching degrees given that they are a relatively new and largely unproven academic innovation (Lyle, 2002). Nonetheless, 100% of participants in the present study were employed at the time of interview, with 80% in coaching related occupations (see Table 2).

Table 2. Coaching Experience Prior to Entry on the Coach Education Programme, and Employment at Time of Interview

Participant	Coaching experience	Age range	Approximate hours per week	Paid/Unpaid	Years of coaching experience	Employment at time of interview
GC1	None					Coach Educator
GC2	National Standard Karate Coach	All	14	P	7	Sports Therapy Lecturer/Part-Time Coach
GC3	Swimming Teacher	All	4	P	3	Primary School Teacher/Part Time Coach
GC4	School Football Coach	U15	2	U	2	Trainee Police Officer
GC5	None					Cost Assistant in Solicitors
GC6	None					Football Coach
GC7	Tottenham Deaf Football Coach	All	6	P	2	PE Teacher/Part Time Football Coach
GC8	US Football Camp	Children	Holiday Job	P	2	Trainee Leisure Manager
	Football Coach	U14	2	U		
GC9	Football Coach	Senior	6	U	< 1	Sporting Opportunities Company Director
GC10	Football Coach	Children	10	P	1	Physical Education Teacher

The coaching modules themselves were also perceived by most graduate coaches to have accelerated their development towards expertise through enhanced knowledge, practice and coaching status. The graduate coaches felt that attendance had helped them to begin developing theoretical underpinning knowledge, while concurrently engaging in sustained vocationally related deliberate practice, both of which have been identified as a contributing towards expertise

(Schempp, McCullick, & Mason, 2006). It would seem therefore that both NGB awards and university-based coach education programmes have an important role to play within the current coach learning climate.

Conclusion

This investigation aimed to explore graduates' perceptions and experiences of a HE coach education programme, and how this formal learning source impacted upon their development and employability, in order to uncover information that could inform future provision.

Findings appeared to strongly support a person-centred philosophy in relation to HE coach education. This raises significant questions regarding how to best deliver HE coach education, and perhaps more importantly the broad purpose of coach education itself. We have recently, for example, seen the introduction of competency based HE coach education (Demers, Woodburn & Savard, 2006; Trudel & Gilbert, 2006), which is arguably the polar opposite of a person-centred approach. The former aspires to educate the coach in all pre-defined relevant areas, whereas the latter concentrates on individualised group learning and, perhaps more importantly, the developing of skills associated with ongoing learning.

Coach education conforming to Rogers' (1969) educational philosophy of teaching students how to learn would concentrate on developing coaches' critical analytical skills, allowing them to engage in ongoing development post-course through self-directed and reflective learning. Greater focus would be placed on the educational process, with the subject merely a vehicle through which to promote intellectual and personal development. Indeed, for Rogers (1969) knowledge is continuously evolving, rather than static, thus rendering the teaching of what is currently believed 'fact' as futile. Witness the explosion of contemporary research into sport science, during which traditional beliefs have been continuously challenged as new knowledge emerges. From a person-centred perspective, then, coach educators should teach coaches to accept and critically engage with this ongoing developmental process.

Although results from the present study would appear to implicitly support the adoption of a person-centred approach to HE coach education, certain factors should be considered. While qualitative research methods may have provided a rich insight into the graduate coaches' views of the course, findings only represent the opinions of a small group of coach learners who experienced undertaking the coaching module pathway of a single HE institution, and cannot be considered representative of all HE coach graduates. Moreover, although interviewing the graduates post-course arguably tapped into the benefits of hindsight, this methodology only allowed for a 'snap-shot' of the coaches' thoughts following course attendance. Further research

is therefore required before a person-centred approach is uncritically employed. Indeed, we are not intending to present this alternative approach as a panacea for problematic issues relating to HE coach education. However, it does represent an alternative philosophical approach to formal coach education that raises fundamental questions that challenge the traditional ideology, and therefore merits further exploration.

Even if person-centred education was established as an optimal approach, consideration needs to be given to the realities associated with trying to implement it in the current university climate and infrastructure. For example, although students in this investigation stated preferences for small group and one-to-one socially interactive learning environments, drives to widen participation in university study are leading to larger group sizes and greater use of virtual learning tools that are often depersonalised. Furthermore, calls for a more flexible and individualised curriculum, would be likely to come into conflict with frequently rather rigid learning outcomes associated with successfully passing modules validated within HE.

Irrespective of the teaching philosophy adopted, university level coach education arguably needs to identify its role in the developmental process by establishing its distinctiveness in the marketplace. Findings from this investigation support a heightened emphasis upon the underpinning *why* of coaching, the promotion of evidence based and critically reflective practitioners, and the cultivation of well balanced and highly employable ‘doers and thinkers’. NGB awards alone seem incapable of producing such a powerful holistic educational package, although they undoubtedly play a crucial role in industrial training and certification. It would therefore appear that HE coach education has a legitimate and important role to play in raising future standards of coaching. Further research into this area is essential if we are to understand and optimise the development of coach learners attending these courses.

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Appendix A – Interview Questions

Motivation

- What motivated you to undertake a sports related degree?
- What factors motivated you to undertake the coaching pathway modules?

Content

- Was there any assessment of your knowledge and coaching experience prior to each of the modules? (Views?)
- Were the modules focused around a set curriculum or the candidates' individual needs? (Preference? Views?)
- Did the tutor explain the importance of coaching theory in relation to coaching practice during the delivery of the curriculum content? (Is this necessary? Examples?)
- Was the content pitched at the right level to optimally promote your coaching development? (Views? Examples?)
- Were there any elements of the content you would have liked covered in greater or less detail? (What? Why?)
- What recommendations would you give to improve the content of the coaching pathway?

Delivery

- How was the content typically delivered? (clarification probe = e.g., lectures, group discussion, sharing of ideas and experiences, etc) (elaboration probe = anything else?)
- To what extent did the delivery style match how you prefer to learn?
 - o How do you prefer to learn?
- Were you given the opportunity to apply theory to practice? If so, how and in what context? (Examples?)
- What recommendations would you give to improve delivery of the coaching pathway?

Assessment

- What methods of assessment were employed?
- What are your preferred methods of assessment and why?
- Were the candidates given individual feedback on their coaching development? (Examples?)
 - o Feedback on coaching knowledge?

- o Feedback on coaching practice?
- What recommendations would you give to improve assessment of the coaching pathway?

Impact

- How has the coaching pathway impacted upon your coaching knowledge? (Examples?)
- How has the coaching pathway impacted upon your coaching practice? (Examples?)
- How did your experiences of the coaching pathway compare and contrast with NGB coaching awards? (Views? Was there any overlap?)
- Do you think you are a better coach for having undertaken the coaching pathway? (Why?)
- In your opinion how has the coaching pathway impacted upon your employability?
- Do you feel that the coaching pathway has accelerated or added value to your coaching development? (How?)

Wrap up question

- Is there anything else that you would like to add in regards to your experience of the coaching pathway, and its subsequent impact on your development?

Coaches' Efficacy Beliefs towards Working with Gay, Lesbian, and Bisexual Athletes

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Abstract

Collegiate athletics has been found to be more hostile to gay men and lesbians than other components of a campus (Wolf-Wendel, Toma & Morpew, 2001). There is little doubt that within this arena, the coach plays a pivotal role in establishing an environment free of harassment, fear, and derogatory terms. However, quantitative research is lacking in this area. The primary objective of this project was to better understand current coaches' attitudes and efficacy levels of working with gay, lesbian and bisexual athletes (GLB). Two hundred and ninety six Division I and II collegiate coaches were surveyed via the internet and asked to complete an efficacy scale created by the investigators as well as demographical questions. Results showed that overall, collegiate coaches reported relatively high efficacy in most aspects of coaching GLB athletes; however, gender differences existed. Findings from this project will help direct efforts towards education programs for coaches.

Keywords: homosexuality, lesbian, gay, bisexual, coaches, efficacy

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Introduction

The sports arena is often viewed through rose-colored glasses and portrayed as character building, friendship forming, and an overall fun-filled environment (Coakley, 2007). However, while sports can certainly fill these expectations, there is also the potential of personal struggle, discrimination, and harassment within athletics (Griffin, 1998). Typically victims of such occurrences are those that are considered within society to be "different," such as gay, lesbian, and bisexual (GLB) athletes.

Our society today is a pervasive heterosexist culture, which is often compounded with homonegative attitudes (Krane, 1996). Individuals identifying with homosexuality may feel stereotyped, rejected, harassed or victimized (McCaughy, Dillon, Jones & Smigell, 2005). These various forms of non-acceptance occur within the community, at home, at school, and within the sport setting. For many GLB athletes, these environments overlap, with homonegativity beginning early (Ryan, 2000). Homonegativity describes "purposeful, not irrational, negative attitudes and behaviors towards nonheterosexuals (Krane, 1996)." Researchers found that students studying to be sport and physical activity professionals held less positive attitudes towards gay men and lesbians than other minority groups, with male students expressing particularly negative attitudes towards gay men (Gill, Morrow, Collins, Lucey, & Schultz, 2006). Such attitudes only perpetuate the hostile environment in which future athletes are raised. This is consistent with reports from the National Gay and Lesbian Task Force Policy Institute (Rankin, 2003), Human Rights Watch (2001), and the Kaiser Family Foundation (2001). These reports imply sport settings are exceptionally hostile environments for GLB individuals.

Research on GLB athletes and sexual prejudice is limited, particularly within youth sports (Gill, et al., 2006). This may be due to the sensitive nature of the subject for many; as a result, more research is available from older populations, such as collegiate students. While college campuses are often described as places of exploration and learning, they can be potentially problematic for GLB students, particularly when involved within athletics. Even within these higher education settings, athletics are considered to be a homonegative and heterosexist environment (Dundes, 1985; Griffin 1998; Galst, 1998; Krane, 1997; Lenskyj, 1997; Rotella & Murray, 1991; Wellman & Blinde, 1997; Wolf-Wendel, Toma, & Morphew, 2001). Heterosexism is defined as the belief that heterosexuality is the correct norm and the assumption that everyone is heterosexual (Hyde & DeLamater, 2006). In fact, Wolf-Wendel, Toma, & Morphew (2001) found athletics (with responses from both coaches and athletes) to be more hostile to gay men and lesbians than other components of campus. Within the sporting environment, gay and lesbian athletes are often silenced and forced to conform to the outward appearance of "heterosexuality" (Hekma, 1998; Krane, 1997) or they may even experience blatant discrimination such as the loss

of a college scholarship, dismissal from a team, or being passed over for selection (Griffin, 1998; Nelson, 1991). Even if this discrimination hasn't happened, the threat of such discrimination may reinforce the pressure on these student athletes to conform. This forced silence, as well as other forms of discrimination and prejudice, have negative psychological effects in both gay and lesbian athletes (Krane, 1996; Rotella & Murray, 1991).

At the same time, while homonegative sport experiences worsen the impact of homonegativism experienced by athletes, lesbians exposed to positive role models and social support in athletics develop a more positive identity (Krane, 1996). While Krane's model was formulated with the lesbian athlete in mind, it is reasonable to assume that positive role models and strong social support would also be beneficial for gay and bisexual athletes as well. Certainly, sport coaches can be such a role model.

Regardless of an athlete's sexual orientation, there can be no doubt that within the athletic arena, the coach plays a pivotal role in establishing the team climate and environment. According to Horn (2002), effective coaching behaviors are defined by "that which results in either successful performance outcomes or positive psychological responses on the part of the athletes (e.g., high self-esteem, high levels of sport enjoyment, etc)" (p. 309). This definition is strengthened through others' beliefs that the coach, and the quality of his/her leadership, actually plays a large role in team morale and performance (Bandura, 1997) and that a coach's behavior establishes formal and informal norms and expectations within a team (Weinberg & Gould, 2003). Researchers have found that athletes often look to the coach, as well as the established norms, moral atmosphere, and social environment to predict rules compliance (Long, Pantaleon, Bruant, & d'Arripe-Longueville, 2006). Clearly, for GLB athletes, the coach's behavior would be critical in establishing an environment that would foster, as opposed to harm, their psychological development. This would include an environment respectful of diversity and free of harassment, fear, and derogatory and slang terms for GLB individuals (Griffin, 1998). Coaches should also strive to model and create an environment of inclusion through language and acceptance, as opposed to discrimination or even just tolerance, for GLB athletes. The National Association for Girls and Women in Sport (NAGWS) endorses the recommendation that "coaches should confront any homonegative language and behavior used by athletes and members of coaching staffs" and that "coaches should be role models of inclusive language and acceptance of diverse individuals;" to our knowledge, no research has explored coaches' beliefs in their ability to meet these expectations (e.g., self-efficacy) (Barber & Krane, 2007).

Within self-efficacy theory, coaching efficacy is believed to encompass more than skill development. Efficacious coaches will also provide athletes with support and guidance on personal matters and assist student-athletes in learning to manage behavioral problems encountered through sport (Bandura, 1997). Additionally, a coach's efficacy as a tutor and a motivator appears to be

the common thread among strong leaders (Bandura, 1997). GLB athletes face unique challenges within sports and these challenges may impact their confidence in themselves and in their performance (Krane, 1996; Rotella & Murray, 1999). It is also in the coaches' best interest to support, guide, and in some cases even protect, GLB athletes as this will not only help GLB athletes perform to the best of their ability, but may also help overall team performance through enhanced cohesion. Teams that welcome and embrace diversity are not distracted by diversity related issues and are thus free to focus on performance (Krane, 1996).

While previous research has explored relationships between coaching efficacy and performance (Feltz, Chase, Moritz, & Sullivan, 1999; Myers, Vargas-Tonsing, & Feltz, 2005), and the techniques coaches use to enhance athletes' efficacy (Vargas-Tonsing, Myers, & Feltz, 2004), we are unaware of research exploring coaches' efficacy towards working with the GLB athletic population. Research into coaches' efficacy in this area is critical, as it will offer the initial step into understanding the tools and education coaches need in order to best meet the psychological needs of GLB athletes. Insight into coaches' efficacy towards working with the GLB athletic population may also offer justification for improved coaching education regarding sexual orientation and inclusion. These two criteria are endorsed by the NAGWS. The present study seeks to offer an exploratory examination into coaches' efficacy towards working with GLB athletes as well as investigate potential gender differences among male and female coaches.

Method

Participants

Participants for this study were male ($n = 155$) and female ($n = 141$) Division I collegiate coaches from the southern half of the United States. Head and assistant coaches from all National Collegiate Athletic Association (NCAA) sanctioned sports were identified through the NCAA website (<http://www.ncaa.org/wps/ncaa?key=/ncaa/ncaa/about+the+ncaa/membership>) and asked to participate. There were a total of 155 male coaches and 141 female coaches participating in this study; of the participating coaches, 63.5% ($n = 216$) coached female sports and 22.4% ($n = 76$) coached male sports. The remaining coaches did not indicate the gender of their teams. The mean age of the participants was 35.76 ($SD = 9.5$); they had worked in their current position for an average of 5.27 years ($SD = 5.43$), and had been coaching at the collegiate level for an average of 9.86 years ($SD = 7.17$). Less than one percent ($n = 3$) indicated they were gay, 7% ($n = 22$) coaches indicated they were lesbians, and less than 1% ($n = 5$) coaches indicated they were bisexual. Eighty-nine percent of the respondents ($n = 264$)

identified as being heterosexual and approximately 15% ($n = 46$) declined to answer.

Measures

Efficacy Scale to Coach Gay, Lesbian, and Bisexual Athletes. This 20-item efficacy scale was designed by the investigators through consultation with sexual orientation and self-efficacy experts. Initial pilot testing of the scale was conducted on 40 coaches working with elite high school and college athletes and revealed a reliability of .93 for the items selected. All items were retained and the final reliability analysis revealed a Cronbach's alpha of .92.

The survey asked participants to respond on a 5 point Likert scale from 1 (not at all confident) to 5 (extremely confident) in areas such as creating a safe environment, locating GLB resources for athletes, managing conflicts between GLB and non-GLB athletes, and setting an example of inclusion (see appendix).

Demographic questionnaire. Additional questions were used to assess participants' demographic information. Questions assessed variables such as age, gender, coaching experience, and sexual orientation.

Procedure

Human subject approval was obtained from the Institutional Review Board before beginning any part of this project. An initial participant pool was compiled from division I colleges across the southern half of the United States. Potential participants were located via university athletic websites. Initial contact with these individuals was made through an email with solicitation to complete a survey. The email text explained the purpose and procedures of the study and included a link to the informed consent website. After indicating consent by clicking the appropriate link, participants were directed to an online survey. Upon completion of the survey, participants were then directed to a separate webpage to provide contact information to be entered into a drawing to receive a monetary gift certificate. Follow-up emails were sent to all participants at the end of week three and week five. Of the solicited 3004 coaches, 11.3% completed all or part of the online survey. All questionnaires were anonymous and did not ask for potentially identifying information such as sport coached.

Results

Table 1 contains coaches' efficacy beliefs for each of the 20 GLB related concerns, ordered from the highest overall mean to the lowest. Coaches' beliefs were highest in their ability to instill an

attitude of respect for others, to treat all athletes, regardless of sexuality, in a similar manner, and in their ability to coach bisexual athletes. Coaches were less efficacious when it came to identifying GLB resources for coaching, identifying GLB resources for their athletes, and in coaching gay athletes.

Table 1. Coaches' Efficacy Beliefs

GLB Efficacy Item	All Coaches			Female Coaches			Male Coaches		
	N	M	SD	N	M	SD	N	M	SD
1. Instill an attitude of respect for others	334	4.70	0.63	140	4.84	0.37	154	4.62	0.71
2. Treat all athletes, regardless of sexuality, in a similar manner	337	4.55	0.79	141	4.70	0.58	153	4.44	0.89
3. Coach bisexual athletes	337	4.47	0.83	141	4.66	0.55	152	4.34	0.97
4. Prevent GLB stereotypes from affecting your coaching	338	4.37	0.83	141	4.50	0.74	155	4.34	0.83
5. Remain unbiased in your selection of team members regardless of perceived sexual orientation	339	4.36	0.95	141	4.55	0.80	155	4.19	1.05
6. Be open regarding your own sexual orientation	332	4.30	1.11	140	4.23	1.14	153	4.47	0.93
7. Discipline athletes who engage in anti-gay actions	336	4.28	0.98	141	4.31	0.91	155	4.32	0.96
8. Coach lesbian athletes	339	4.23	1.50	141	4.72	0.54	154	3.80	1.90
9. Set an example of inclusion	335	4.22	0.92	139	4.45	0.73	155	4.08	0.96
10. Create a "safe" environment for GLB athletes	339	4.17	0.92	141	4.32	0.79	154	4.09	0.99
11. Refrain from imposing your beliefs on your athletes	334	4.10	1.12	141	4.28	1.01	154	3.97	1.19
12. Create an environment of inclusion (i.e. where GLB individuals feel welcome)	336	4.10	0.97	141	4.35	0.76	154	3.90	1.01
13. Remain unbiased towards athletes who do not follow traditional gender expectations for appearance and dress	336	4.00	1.09	141	4.26	0.92	155	3.81	1.12
14. Deal with parental concerns and complaints about GLB issues in a way that values diversity	332	3.93	1.00	140	4.12	0.95	152	3.82	0.97
15. Manage conflicts between an GLB athlete and a non-GLB athlete	337	3.88	0.94	141	4.05	0.85	154	3.72	0.99
16. Prevent feelings of isolation of GLB athletes	335	3.79	1.01	140	4.04	0.86	154	3.60	1.04
17. Prevent GLB issues from becoming a distraction to your team	336	3.59	1.03	141	3.79	0.93	153	3.41	1.05
18. Coach gay athletes	335	3.50	2.07	139	3.24	2.28	154	3.95	1.64
19. Identify GLB resources for athletes	337	3.47	1.27	141	3.76	1.22	154	3.25	1.22
20. Identify GLB resources for coaching	332	3.32	1.25	140	3.66	1.18	152	3.03	1.218

Table 2. Summary of MANOVA Results by Gender

Dependent Variable	df	SS	Ms	F	p	d
1. Instill an attitude of respect for others	1	2.95	2.95	8.64	.004*	.41
Error	267	91.14	.34			
2. Treat all athletes, regardless of sexuality, in a similar manner	1	4.74	4.74	7.94	.005*	.35
Error	267	159.37	.60			
3. Coach bisexual athletes	1	9.08	9.08	13.93	.000*	.42
Error	267	173.91	.65			
4. Prevent GLB stereotypes from affecting your coaching	1	2.56	2.56	4.01	.046*	.20
Error	267	170.64	.64			
5. Remain unbiased in your selection of team members regardless of perceived sexual orientation	1	7.91	7.91	9.22	.003*	.59
Error	267	229.17	.86			
6. Be open regarding your own sexual orientation	1	3.11	3.11	2.95	.087	.23
Error	267	281.19	1.05			
7. Discipline athletes who engage in anti-gay actions	1	0.10	0.10	0.11	.745	.01
Error	267	242.91	.91			
8. Coach lesbian athletes	1	63.50	63.50	32.35	.000*	.76
Error	267	524.21	1.96			
9. Set an example of inclusion	1	9.96	9.96	13.136	.000*	.44
Error	267	202.36	.76			
10. Create a "safe" environment for GLB athletes	1	3.04	3.04	3.81	.052	.26
Error	267	212.91	.80			
11. Refrain from imposing your beliefs on your athletes	1	4.16	4.16	3.39	.067	.28
Error	267	327.19	1.23			
12. Create an environment of inclusion (i.e. where GLB individuals feel welcome)	1	15.38	15.38	18.86	.000*	.51
Error	267	217.71	.82			
13. Remain unbiased towards athletes who do not follow traditional gender expectations for appearance and dress	1	11.73	11.73	11.36	.001*	.44
Error	267	229.17	.86			
14. Deal with parental concerns and complaints about GLB issues in a way that values diversity	1	4.80	4.80	5.14	.024*	.31
Error	267	248.97	.93			
15. Manage conflicts between an GLB athlete and a non-GLB athlete	1	7.07	7.07	8.05	.005*	.36
Error	267	234.63	.88			
16. Prevent feelings of isolation of GLB athletes	1	10.64	10.64	11.57	.001*	.46
Error	267	245.50	.92			
17. Prevent GLB issues from becoming a distraction to your team	1	7.13	7.13	7.27	.007*	.38
Error	267	261.71	.98			
18. Coach gay athletes	1	33.78	33.78	8.51	.004*	.36
Error	267	1060.46	3.97			
19. Identify GLB resources for athletes	1	12.74	12.74	8.68	.004*	.42
Error	267	393.67	1.47			
20. Identify GLB resources for coaching	1	13.34	13.34	13.67	.000*	.53
Error	267	377.74	1.42			

Note. *Significant p values

Table 3. Correlations between Coaches' Efficacy Perceptions

How confident are you in your ability to	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Coach lesbian athletes?	1																			
2. Coach gay athletes?	0.02	1																		
3. Remain unbiased in your selection of team members regardless of perceived sexual orientation?	.39**	.20**	1																	
4. Coach bisexual athletes?	.43**	.22**	.65**	1																
5. Create a "safe" environment for GLB athletes?	.34**	0.09	.50**	.55**	1															
6. Treat all athletes, regardless of sexuality, in a similar manner?	.38**	.25**	.68**	.76**	.56**	1														
7. Manage conflicts between an GLB athlete and a non-GLB athlete?	.33**	.22**	.47**	.48**	.59**	.49**	1													
8. Prevent GLB issues from becoming a distraction to your team?	.38**	.23**	.57**	.47**	.55**	.48**	.74**	1												
9. Prevent GLB stereotypes from affecting your coaching?	.27**	.23**	.57**	.61**	.49**	.65**	.52**	.53**	1											
10. Identify GLB resources for my athlete?	.23**	.12*	.37**	.32**	.42**	.39**	.40**	.46**	.40**	1										
11. Create an environment of inclusion (i.e., where GLB individuals feel welcome)?	.34**	.15**	.57**	.55**	.65**	.60**	.58**	.60**	.58**	.50**	1									
12. Set an example of inclusion?	.26**	.14**	.56**	.56**	.54**	.61**	.53**	.48**	.61**	.49**	.77**	1								
13. Prevent feelings of isolation for GLB athletes?	.35**	.18**	.52**	.53**	.59**	.56**	.62**	.64**	.52**	.44**	.70**	.62**	1							
14. Identify GLB resources for coaching?	.28**	0.1	.37**	.31**	.45**	.36**	.45**	.49**	.32**	.77**	.51**	.48**	.52**	1						
15. Refrain from imposing your beliefs on your athletes?	.26**	.13*	.59**	.39**	.46**	.50**	.29**	.40**	.43**	.32**	.49**	.46**	.44**	.36**	1					
16. Be open regarding your own sexual orientation?	0.08	.16**	.15**	.13*	.20**	.17**	.14*	.17**	.25**	.15**	.19**	.22**	.13*	0.1	.18**	1				
17. Instill an attitude of respect for others?	.22**	.12*	.45**	.58**	.46**	.58**	.36**	.32**	.50**	.31**	.49**	.51**	.44**	.29**	.32**	.24**	1			
18. Remain unbiased towards athletes who do not follow traditional gender expectations for appearance and dress?	.39**	.19**	.58**	.51**	.40**	.54**	.49**	.56**	.56**	.43**	.56**	.54**	.57**	.47**	.52**	.20**	.42**	1		
19. Discipline athletes who engage in anti-gay actions?	.12*	.19**	.32**	.42**	.40**	.37**	.36**	.34**	.45**	.29**	.45**	.46**	.44**	.31**	.34**	.21**	.46**	.42**	1	
20. Deal with parental concerns and complaints about LGB issues in a way that values diversity?	.24**	.26**	.46**	.52**	.46**	.51**	.54**	.57**	.53**	.45**	.62**	.57**	.61**	.48**	.36**	.13**	.46**	.57**	.54**	1

* $p < .05$ ** $p < .01$

A listing of coaches' efficacy beliefs according to gender of the coach can also be found in Table 1. One-way MANOVAs were conducted on the perceptions of male and female coaches, using the 20 items as dependent measures. Results were considered to be significant with a p value of .05. Differences were found between male and female coaches' efficacy beliefs, Wilks Lambda = .75, $F(20, 248) = 4.04$, $p < .01$. Univariate F -tests indicated that female coaches reported higher feelings of efficacy in 15 of the 20 items. Male coaches reported higher efficacy in their ability to coach

gay athletes; ($M_{mc} = 3.95$, $SD = 1.64$; $M_{fc} = 3.24$, $SD = 2.28$; $d = .36$). All MANOVA results can be found in Table 2; Table 3 contains a listing of all correlations between efficacy items.

Discussion

Sport literature is lacking in quantitative information related to coaches and their efficacy in working with GLB athletes. The few studies that examine coaches' perceptions and attitudes about gay and lesbian athletes have utilized qualitative study designs (Iannotta, 2003; Wellman, & Blinde, 1997; Wolf-Wendel, et al., 2001). While this provides tangible examples of the environment, it limits understanding of the pervasiveness of the issue. As well, sport research rarely, if ever, includes bisexual athletes. This project sought to help fill these gaps. The findings of this study suggest that overall, collegiate coaches reported relatively high efficacy in most aspects of coaching GLB athletes; however, gender analyses offered a more comprehensive picture of coaches' reported efficacy. These results offer new insight into coaching efficacy and will help guide future research as well as coaching education curriculums.

Coaches appeared to be confident in their ability to maintain a respectful, non-biased atmosphere and less confident in their ability to find GLB resources for themselves and their athletes. Interestingly, gender analyses revealed that female coaches reported significantly higher efficacy scores than their male counterparts on most items. This is interesting as previous research has failed to indicate strong differences in coaching efficacy between men and women (Marback, Short, Short, & Sullivan, 2005; Lee, Malet, & Feltz 2002). This more positive attitude might help female coaches focus more on their coaching ability and less on an athlete's sexual orientation. Athletes' sexual orientation did appear to impact coaches' efficacy. While coaches differed in their efficacy for coaching bisexual athletes, the starkest contrasts came when coaching homosexual individuals of the opposite gender; female coaches were more confident than male coaches in their ability to coach lesbians and less confident than male coaches in their ability to coach gay athletes. This is surprising as past research has found that females typically show more positive attitudes towards GLB individuals than males (Gill et al., 2006). However, perhaps coaches, regardless of sexual orientation, still identify more with their own gender. It is important to note that only 22% of the participants coached male sports. It is possible that the responding male coaches were coaches of non-media sports (as opposed to football and basketball) and this may have afforded them a more positive view. Some report that levels of masculinity within a sport may be a critical factor in the culture related to gay issues (Anderson, 2005). For example, sports requiring aggressive and physical play are often considered to be the epitome of what it means to be an American male. Sports that often bring male athletes the most attention and praise include football,

hockey and basketball (McCaughtry, Dillon, James and Smigell, 2005).

Coaches, both male and female, were least confident in their ability to locate GLB resources for coaching and for their athletes. This finding seems to signify a need for changes within the educational system. Gill et al. (2006) noted that most students studying to be sport and physical activity professionals do not receive any training within diversity or multicultural issues; others have argued that the inclusion of homosexuality should be included within teaching education (Lipkin, 2001). Barber and Krane (2007), with an endorsement from NAGWS, noted that "coach education programs should include information about sexual orientation and gender identity as well as specific strategies for creating inclusive environments" (p. 54). While some have called for diversity initiatives (Fink & Pastore, 1999), the inclusion of information regarding sexual orientation, gender identity, and strategies for creating inclusive environments (Barber & Krane, 2007), coaching education content typically focuses on performance enhancement (Cushion, 2001; Luikkonen, Laasko, & Telama, 1996). Through this new insight into coaches' perceptions of their ability to coach GLB athletes, coaching education programs can be created to assist coaches and athletic departments to develop and maintain environments that are non-prejudicial and inclusive. These skills may be especially important for those who are coaching a team of the opposite gender. Additionally, coaches need assistance in increasing their awareness of campus and community GLB resources. Activist groups, universities, and coaching educators should strive to not only have information available but to be proactive in getting that information to coaches, athletes, and athletic directors.

This study had much strength, and while there were limitations, these constraints do not hinder the significance of these findings. To begin, there was the potential for bias within the responses. The overall low response rate potentially could have resulted in a biased pool of participants. It is possible that the coaches who were willing to respond to this survey were willing to do so due to their more positive attitudes towards GLB individuals. There may have also been a social desirability effect for the participants which could have contributed to the high levels of reported efficacy. While male and female coaches participated in the study, less than a quarter of the respondents coached male teams. This again could have resulted in a biased participant pool. It is also possible that many of the high profile sports (e.g., football and basketball) did not respond due to time constraints. The inclusion of such sports is important for future research as these sports are often considered to be "macho" (McCaughtry, et al., 2005) and their coaches' attitudes and efficacy may provide a more comprehensive view regarding the GLB climate in athletics. It is also important to note that there were numerous correlations amongst the items on the efficacy scale. This may indicate that the efficacy items were measuring overlapping aspects of the same behavior. Additionally, highly correlated dependents in a MANOVA the power of the tests (Type II error).

Conclusion

This study offered new and valuable insight into coaches' efficacy beliefs when working with GLB athletes. While coaches appeared to be efficacious when dealing with respect and discipline, there were several areas in which their confidence decreased. Much research is needed in this area, and these findings will provide a foundation to further explore how to improve coaching efficacy and coaching education programs when dealing with issues that surround GLB student-athletes.

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Appendix

Coaches are often asked to coach and develop athletes from diverse backgrounds, including gay, lesbian, and bisexual athletes (GLB). Coaching confidence refers to the extent to which coaches believe that they have the capacity to affect the psychological and skill development of their athletes regardless of their background.

Please read each of the following statements and rate them according to how accurately they describe your coaching confidence. Please respond honestly and answer every question according to the rating scale below.

1	2	3	4	5
Not at all				Extremely
Confident				Confident

How confident are you that you can ...

1. remain unbiased in your selection of team members regardless of perceived sexual orientation?
2. coach lesbian athletes? **(please put NA if not applicable)**
3. coach gay athletes? **(please put NA if not applicable)**
4. coach bisexual athletes?
5. create a "safe" environment for GLB athletes?
6. treat all athletes, regardless of sexuality, in a similar manner?
7. manage conflicts between an GLB athlete and a non-GLB athlete?
8. prevent GLB issues from becoming a distraction to your team?
9. prevent GLB stereotypes from affecting your coaching?
10. identify GLB resources for my athlete?
11. create an environment of inclusion (i.e., an environment that is welcoming and nonjudgmental)?
12. set an example of inclusion?
13. prevent feelings of isolation for GLB athletes?
14. identify GLB resources for coaching?
15. refrain from imposing your beliefs on your athletes?
16. be open regarding your own sexual orientation?
17. instill an attitude of respect for others?

18. remain unbiased towards athletes who do not follow traditional gender expectations for appearance and dress?
19. discipline athletes who engage in anti-gay actions?
20. deal with parental concerns and complaints about GLB issues in a way that values diversity?

The Influence of Basketball Dribbling on Repeated Sprints

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Abstract

Understanding the effect of basketball dribbling on physiological responses and performance indices during repeated sprint tests (RST) may assist coaches to better appreciate training loads and the player's performance capabilities in sessions that use dribbling as a movement pattern. Thirteen young male basketball players performed two forms of RSTs (6×30 m, departing every 30 s) with and without dribbling, in random order. Peak heart rate and post RST blood lactate concentrations were significantly higher after RST without dribbling than with dribbling (180.0 ± 2.8 vs 171.5 ± 2.2 b/min and 9.9 ± 0.8 vs 6.5 ± 0.8 mMol/L, respectively, $p < 0.05$). Fastest sprint time and total sprint time were significantly faster in RST without dribbling than with dribbling (4.51 ± 0.14 vs 4.73 ± 0.15 s and 28.25 ± 0.89 vs 29.54 ± 0.99 s, respectively; $p < 0.05$). No significant difference was found in performance decrement between the two RSTs. There was a significant correlation ($p < 0.05$) between the fastest sprint time with and without dribbling ($r = 0.94$), and between the total sprint time with and without dribbling ($r = 0.95$). There was no correlation between performance decrements with and without dribbling. Backline players had significantly fastest sprint time and total sprint time compared to the frontline players, both with and without dribbling. The findings indicate that training sessions designed to develop fitness

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components such as power and speed may be more intense if performed without using balls. However, dribbling at high speeds lowers physiological responses compared to a non-dribbling sprint running, and therefore may enable longer training sessions. These longer training sessions may be used to improve individual ball specific skills and/or practice team tactics.

Keywords: speed, training, ball skills, performance decrement, fitness

Introduction

The game of basketball is characterized by numerous explosive bursts of activity, including jumping, turning, and sprinting for short distances. Players also walk or jog during the game while recovering from intense activities (Janeira & Maia, 1998). Previous studies emphasized that from a metabolic point of view, in a sport like basketball both the aerobic and the anaerobic energy systems are involved (McInnes, Carlson, Jones, & McKenna, 1995; Smith, & Thomas, 1991). However, a number of investigators suggested that success in basketball appears to be more dependent upon the player's anaerobic rather than aerobic power (Castagna, Manzi, D'Ottavio, Annino, & Bishop, 2007; Hoffman, Tennenbaum, Maresh, & Kraemer, 1996; Ostojic, Mazic, & Dikic, 2006), as well as on anthropometric (Litkowycz, Zajac & Waskiewicz 2005) and selected aspects of motor coordination (spatial orientation, focused attention and movement acquisition rate) (Zwierko, Lesiakowski & Florkiewicz 2005). Anaerobic fitness components (e.g. sprint time, jumping height) were also found to best discriminate the season-long success between teams that are on the top and on the bottom of the league standing (Ibanez et al., 2008). The anaerobic ability of top basketball players was also found to be significantly higher than average players (Drinkwater, Hopkins, McKenna, Hunt, & Pyne, 2007). Reports from European First Division teams revealed that the mean total distance covered by male players during a game was between 3500 m to 5000 m (Janeira & Maia, 1998). The majority of the distance (2000 m – 3000 m) was performed in slow (1 – 3 m/s) or moderate speed (750 m – 1500 m, 3 – 5 m/s), while high speed (>5 m/s) accounted for only 300 m to 990 m. Janeira and Maia (1998) also found that the first half was more intense than the second half in a basketball game in the first male Portuguese league. The total distance, as well as the distance covered in moderate and high speeds, was significantly higher in the first half compared to the second half. McInnes et al, (1995) reported a mean activity frequency of elite players during a game in the Australian National League of 997 ± 183 , with a change in movement category every 2.0 s. The mean duration of all activities was less than 3 s. A mean total of 105 ± 52 high-intensity runs (mean duration 1.7 s) were recorded, resulting in one high-intensity run every 21 s during a game.

Similar data was found by Bishop and Wright (2006) and by Ben Abdelkrim et al, (2007) for under 19 years old and for adult professional players, respectively.

In basketball, simultaneous performance of more than one skill is often required. An example of this might be running and dribbling, which are frequently performed at the same time by players during the game. Dribbling can be performed at a slow pace while executing a progressively planned play, or at maximal speed while executing a fast break. In the latter, we believe that dribbling may become a complicated task and control of the ball becomes much more difficult. Studies comparing physiological responses between a regular run and a run while dribbling a ball have been made mainly in soccer. Reilly and Ball (1984) found that during the same sub-maximal running speed, dribbling a soccer ball brought about an additional energy cost of 5.2 kJ/min. The increased metabolic demand during dribbling was accompanied by an increase in blood lactate concentration and rating of perceived exertion (RPE). In another study, Smith and Chamberlin (1992) found that dribbling a ball decreased the 15 m slalom running speed compared to a slalom run without dribbling in female soccer players. Therefore, a distinction should be made between maximal and sub-maximal running speed or between slalom and a straight-line running. It seems that in soccer, dribbling the ball puts an extra load on the metabolic system as well as on the neuromuscular system, compared to a run without dribbling at the same sub-maximal speed. The metabolic effect during maximal speed run (straight line or slalom) which is slowed by dribbling is yet to be determined.

To the best of our knowledge, the effect of dribbling on running speed and on physiological responses of basketball players has not been studied. If dribbling the ball changes markers of training intensity, coaches should be aware of these changes, as they may influence the player's ability to sustain intensity during training. This is important, since based on field experience of elite local basketball coaches, in recent years many basketball coaches tend to combine work on fitness components (such as speed) with practice of specific game skills (such as dribbling) at the same training session. However, this approach was never examined in a scientific work. According to this perception, intensity of these sessions is maintained at high level, in spite of the use of skill elements (such as dribbling). If this is the case, then training with a ball may be a more effective training method, as it gives the players an opportunity to work on ball skills and on fitness components simultaneously. On the other hand, if the ball imposes mobility limitations and reduces intensity, then fitness can be decreased, and special training session should be performed without the ball. In order to discern between these two training models, the aim of the present study was to examine the effect of specific basketball skill elements, such as dribbling, on sprint running time, speed maintenance, and physiological responses during repeated sprints in young basketball players. Based on the previous findings of decreased maximal speed while dribbling a soccer ball, we hypothesized that basketball dribbling

will lead to a decrease in running speed. The reduced speed will be associated with lower metabolic (blood lactate) and cardiovascular responses (heart rate) during repeated sprints.

Method

Participants

Thirteen young male basketball players (age 18.2 ± 0.7 years, body height 183.1 ± 1.8 cm, body mass 75.9 ± 2.2 kg) – the full squad of a first division youth league team, participated in the study. All the participants had playing experience of at least seven years (8.8 ± 0.4 years). Out of the 13 players, seven were backline players (BLP – guards and shooters) and six were frontline players (FLP – forwards and centers). Players' height was measured with a stadiometer to the nearest 0.1 cm, and body mass was measured on a balanced scale to the nearest 0.1 kg. The participants were fully informed of the procedures, risks, and possible discomfort involved in performing the testing and gave their informed consent for participation (parents gave their consent for participants under 18 years old). All procedures were conducted in accordance with the Institutional Ethical Committee standards.

Design and Methodology

The study was performed during the first month of the basketball competitive season, when players trained five days per week (about 90 min each practice). Training at that time of the season included many tactical exercises as well as technical drills, with or without the ball. At least, one session per week focused on fitness improvement (especially anaerobic fitness components). The players also had two sessions of weight lifting every week. The participants performed two tests, in random order, separated from each other by five to seven days. The two tests consisted of two forms of RST (Bishop, Spencer, Duffield, & Lawrence, 2001; Spencer, Bishop, Dawson, & Goodman, 2005). In order to prevent unnecessary fatigue accumulation, players and coaches were instructed to avoid intense exercise for the 24-hour period prior to each testing session.

The tests were performed on a basketball court, using typical basketball shoes to replicate playing conditions. Prior to each test participants performed a standard 30 min warm up that included slow jogging, stretching, and specific basketball drills.

Repeated Sprint Tests

Two forms of RST were performed by the participants. Each test included a series of short maximal sprints with short rest periods between runs. Each of the two tests consisted of 6 X 30

m maximal sprint runs starting every 30 s (24-25 s of rest between runs). This work-rest time ratio was similar to those reported during an actual game (McInnes et al., 1995). In one test the players performed regular sprint running. In the other test the players performed the runs while dribbling a basketball.

A 30-m maximal sprint with or without dribbling was performed by each subject following the warm up. The time for each sprint was used as the criterion score during the subsequent RST. In the first sprint of each test, participants were required to achieve at least 95% of their criterion score. If 95% of the criterion score was not achieved, the participant was required to start the RST again. During each RST, a photoelectric cell timing system (Alge-Timing Electronic, Vienna, Austria) with an accuracy of 0.001 s, linked to a digital chronoscope, was used to record each sprint and rest interval time. Two sets of timing gates, at the start and at the finish line, were used, working in opposite directions. The photocell beams were set up relatively high (1.50 m from the ground) so that the beams were broken by the player's upper body and not by the bouncing ball. Participants started each run from a standing position, with their front leg located 50 cm behind the starting line covered by the photocell beam. After the completion of each sprint, the participants tapered their speed down and walked slowly back to the next sprint starting point. The two sets of timing gates worked in opposite directions, allowing the participants to start the next run from the finish line of the preceding sprint, thus eliminating the need to hurry back the entire 30 m to the same starting point. An experimenter was placed at both ends of the track to provide strong verbal encouragement to each subject during every sprint. Participants were instructed prior to the test to perform their maximal effort in each sprint and to avoid pacing themselves. Before the start of the dribbled test, the participants were instructed to dribble the ball according to the rules of the game and to avoid carrying the ball for extra strides. Participants completed a sprint dribbling familiarization session in the week preceding testing.

The three measures for each RST (with and without dribbling) were the fastest 30 m sprint time (FS), the total accumulated six sprints time (TS), and the performance decrement (PD). Total sprint time was calculated as the sum of all six sprint times of each test. Performance decrement was used as an indication of fatigue and was calculated by dividing the sum of the six sprint times by the best possible total score and multiplying by 100 (Fitzsimons, Dawson, & Ward, 1993). The best possible total score was calculated as the fastest 30 m sprint time multiplied by six.

A single drop of blood was taken by finger-prick, and assessed for lactate concentration two minutes after the completion of each RST (Fitzsimons et al., 1993) using a portable lactate analyzer (Accusport, Boehringer Mannehein, Germany). Heart rate was measured using a Polar heart rate monitor (Polar Accurex Plus, Polar Electro, Woodbury, NY) immediately upon

completion of each run in both RSTs (with and without dribbling). Rating of perceived exertion (RPE) was determined using the modified Borg scale (0 – 10) (Borg, 1982) at the end of each RST.

Data Analysis

Paired t-tests were used to determine differences in fastest sprint time, total sprint time, performance decrement, heart rate, RPE, and blood lactate concentration following RST with and without dribbling. We used ANOVA for comparison between FLP and BLP with differences between RST with or without dribbling as the within group factor and the player's role as the between group factor. Pearson correlations were computed between the fastest sprint times, total sprint times, and performance decrements in the two different RSTs. Effect size was calculated as the difference between the means divided by the pooled standard deviation. A large effect size was defined as >0.8 . Data are presented as mean \pm SEM. Significance level was set at $p < 0.05$.

Results

The effect of RST with and without dribbling on peak heart rate, RPE, post RST blood lactate concentration, fastest sprint time, total sprint time, and performance decrement is summarized in Table 1 and Figure 1. Peak heart rate and post RST blood lactate concentrations were significantly higher in RST without dribbling. Fastest sprint time and total sprint time were significantly faster in RST without dribbling (see Figure 1). The differences in peak heart rate, post RST blood lactate concentration, fastest sprint, and total sprint time between RST with and without dribbling were large (effect size > 0.8 , for each variable). There was no significant difference in RPE and performance decrement during RST with or without dribbling.

Table 1. The Effect of Repeated Sprint Test With and Without Dribbling on Peak Heart Rate, Rating of Perceived Exertion (RPE,) and Post-exercise Blood Lactate in Young Basketball Players(N=13)

Variable	No Dribble	Dribble
Heart rate (beats/min)	180.0 \pm 2.8	171.5 \pm 2.2*
RPE	4.0 \pm 0.4	3.8 \pm 0.4
Lactate (mMol/L)	9.9 \pm 0.8	6.5 \pm 0.8*

Data expressed as mean \pm SEM, * $p < 0.05$ for differences with and without dribbling.

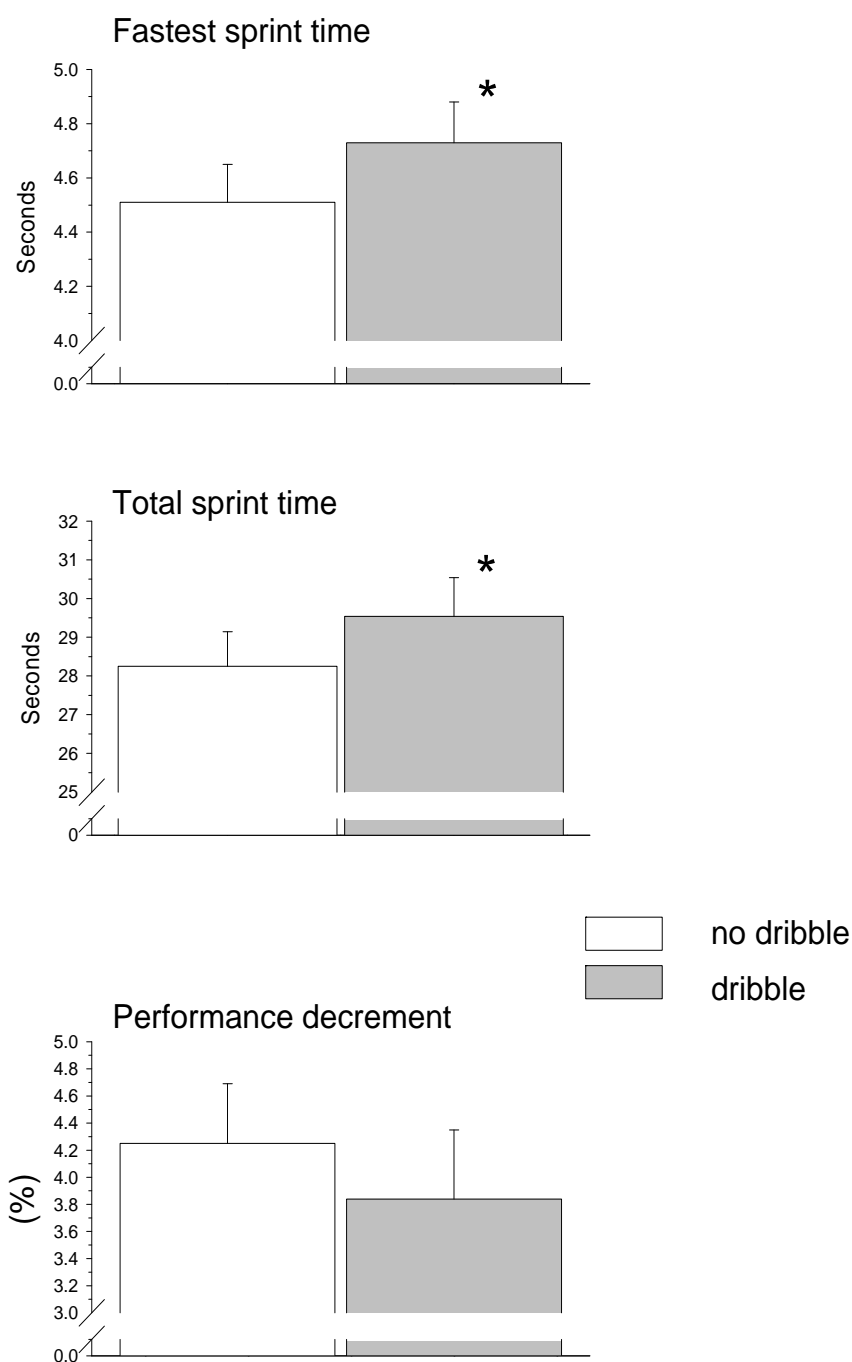


Figure 1. The effect of Repeated Sprint Test with and without dribbling on fastest sprint time, total sprint time, and performance decrement in young basketball players.

* $p < 0.05$ for differences with and without dribbling.

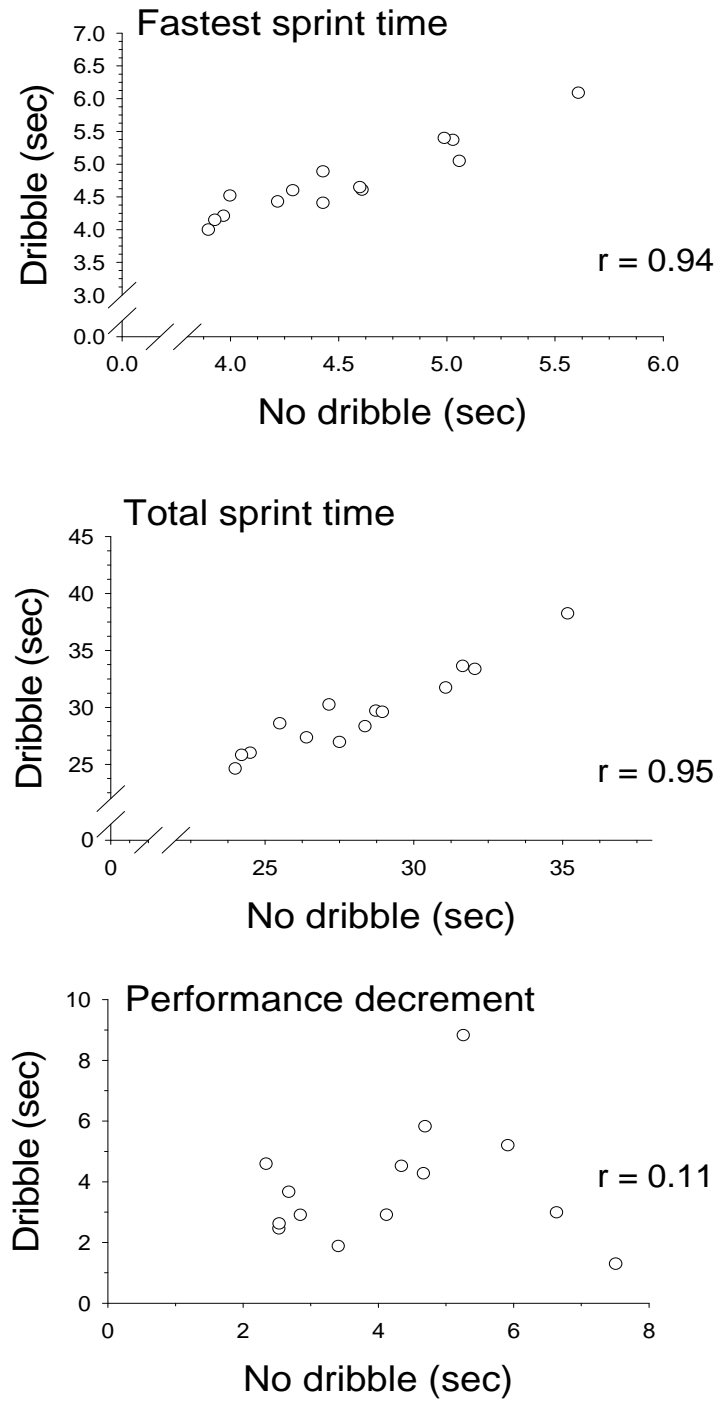


Figure 2. Relationship between Repeated Sprint Test outcomes with and without dribbling in young basketball players.

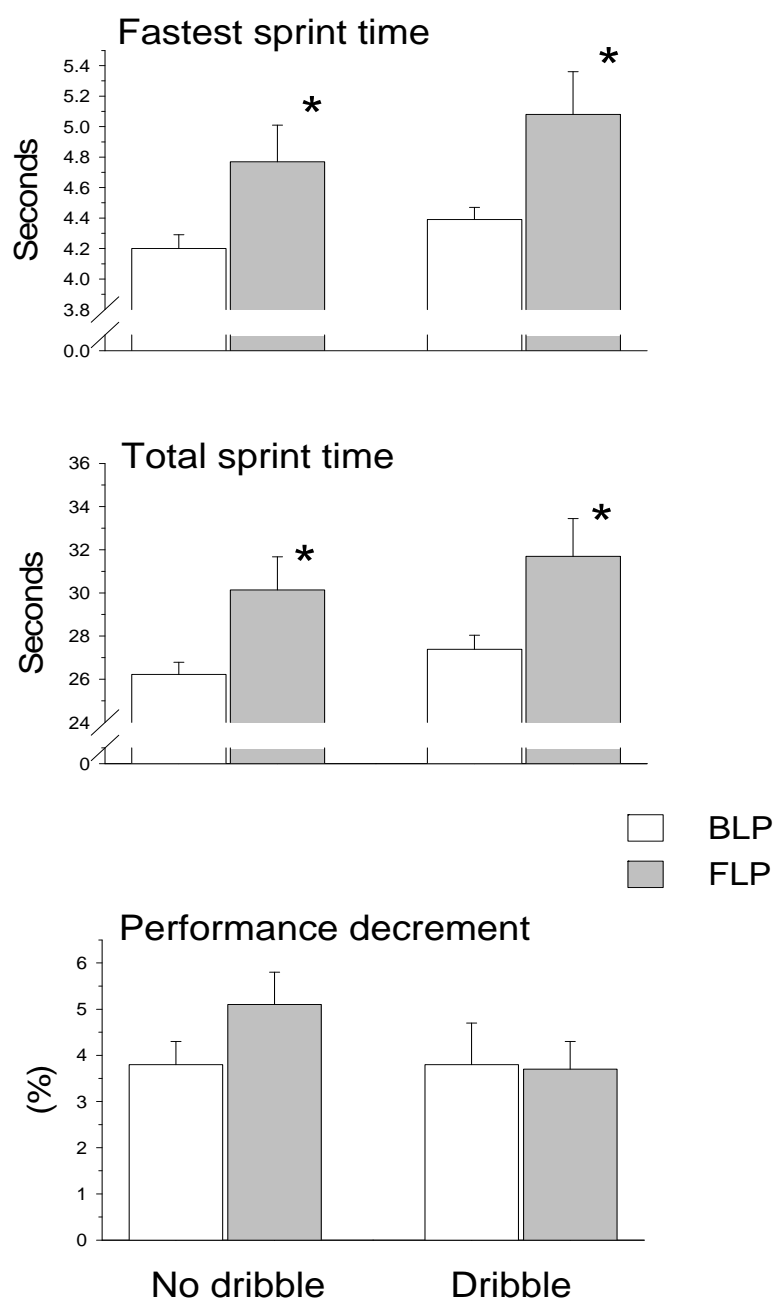


Figure 3. The effect of RST on fastest sprint time, total sprint time, and performance decrement in frontline (FLP) and backline players (BLP).

* $p < 0.05$ for differences between frontline and backline players.

Table 2. Anthropometric Measurements and the Effect of RST on Maximal Heart Rate, RPE, and Post-Exercise Blood Lactate in Frontline and Backline Basketball Players (N=13)

		Frontline Players (n=6)	Backline Players (n=7)
	Age (years)	18.9±1.4	18.0±0.8
	Height (cm)	189.0±1.5	179.7±1.5*
	Weight (kg)	79.8±2.8	75.1±2.6
No dribble	Heart rate (beats/min)	176.0±4.6	181.4±2.6
	RPE	4.3±0.7	3.6±0.4
	Lactate (mMol/L)	10.3±1.8	9.5±0.2
Dribble	Heart rate (beats/min)	169.8±3.2	170.0±1.9
	RPE	3.4±0.5	4.0±0.5
	Lactate (mMol/L)	6.1±1.6	7.2±0.4

Data expressed as mean ± SEM, * p<0.05 for differences between frontline players and backline players.

The relationship between RST outcomes with and without dribbling is shown in Figure 2. There was a significant correlation between the fastest sprint time with and without dribbling, and between the total sprint time with and without dribbling. There was no correlation between performance decrements with and without dribbling.

Anthropometric measures and the effect of RST on peak heart rate, RPE, post RST blood lactate concentration, fastest sprint time, total sprint time, and performance decrement in FLP and BLP are summarized in Table 2 and Figure 3. Front line players were significantly taller than BLP. Back line players had significantly faster fastest sprint time and total sprint time compared to the FLP, with and without dribbling (see Figure 3). There was no significant difference in peak heart rate, RPE, post RST blood lactate concentration, and performance decrement between FLP and BLP in RST with and without dribbling. There was no significant between group difference (FLP versus BLP) in the difference between FS, TS and PD in RST with versus without dribbling.

Discussion

The main findings of the present study were that, consistent with our hypothesis, FS and TS were significantly faster in the RST without dribbling compared to the RST with dribbling. In addition, peak heart rate and post RST blood lactate concentrations were significantly higher in RST without dribbling. Performance decrement was also higher in the RST without dribbling, although not significantly.

These findings may help coaches to assess the effect of pure fitness sessions (performed

without balls), compared to ball-skill training sessions (such as dribbling), and thus to monitor training intensity more accurately. More specifically, the present findings indicate that the additional cognitive elements of dribbling in maximal run, causes basketball players to reduce running speed in single as well as in multiple maximal runs. Consequently, as seen in the present study, the physiological responses to maximal running with dribbling are lower than those during a regular maximal run. These findings may imply that in order to improve the fitness level of the players, coaches should perform separate training sessions without balls. On the other hand, more work can be performed in training sessions where sprints are performed with dribbling. This may allow coaches to extend the time of dribbling-oriented types of training sessions in order to improve individual ball specific skills and/or to practice team tactics.

Consistent with our findings, Smith and Chamberlin (1992) compared a 15 m slalom running time of female soccer players with and without dribbling. They found that dribbling significantly slowed the running time of the 15 m slalom run. Similarly, Leavitt (1979) investigated the capability of ice hockey players to skate as fast as possible with and without stick-handling a puck. They found that skating with a stick adversely affected the speed performance of the players. These results suggest that changes in running mechanics needed to control the ball most likely decrease running efficiency and cause a reduction in running speed.

The significantly higher heart rate and blood lactate levels following the RST without dribbling compared to the RST with dribbling in the present study, suggest that the additional energy cost of the muscular and metabolic systems due to a faster run is more significant than the additional energy cost of the neuromuscular system due to the cognitive influence of dribbling. The relatively low metabolic load of the dribbling run was probably the cause for the lower PD (although non significantly) in the RST with dribbling compared to the RST without dribbling. These findings emphasize, again the importance of pure fitness training sessions that are performed without balls, and clarify their potential for the development of certain fitness components. For example, training sessions that are designed to develop power, speed, and speed endurance may be more effective if performed as regular runs, without dribbling. On the other hand, the use of balls in training sessions, lower intensity level and postpone fatigue. This will probably permit players to exercise specific ball skills (such as dribbling) for a longer time. In light of these differences, coaches and players can now compare the advantages and disadvantages of these training forms and choose the most appropriate training form for their needs. However, it should be noted that these findings relate to maximal run only and that physiological responses can be different for sub-maximal or slow running speed. Indeed, Reilly and Ball (1984) demonstrated that when running was performed at the same sub-maximal absolute speed, dribbling a soccer ball resulted in an additional energy cost of 5.2 kJ/min. The increased metabolism during dribbling was accompanied by an increase in blood lactate concentration and RPE. The

authors suggested that the increased energy cost was due to the additional muscular activity required to control the ball, and to dribbling-related changes in the optimal stride length and rate. However, the only comparison between running with and without dribbling in that study was made for matched sub-maximal running speeds, and not for maximal sprints. In light of this, even though sub-maximal speed was not tested in the present study, it seems that a distinction should be made between maximal and sub-maximal running. While dribbling a basketball was found to decrease intensity in maximal speeds, it may increase intensity at a given sub-maximal speed. Once again, coaches should consider the possible effects of these responses and decide whether the use of a ball serves their purpose according to the level of intensity they desire to implement in a given training session.

We found a very strong correlation between FS time and TS time in RST with and without dribbling (Figure 2). This suggests that regardless of the players' dribbling skill, running ability remains the main contributing factor to running speed, even when the running is accompanied by dribbling. In contrast, there was no correlation between the PD in the two RSTs. This suggests that significant individual variations characterize the relationship between dribbling skills and fatigue, and therefore the effect of dribbling on each player's performance decrement cannot be predicted.

In the present study we also compared differences in RST outcomes between backline (BLP) and frontline (FLP) players (Table 2 and Figure 3). As hypothesized, FS and TS times of the BLP were significantly faster compared to FLP in RST, both with and without dribbling. This demonstrates the differences in the specialization of the two types of basketball players. The faster running times of the BLP in both RSTs demonstrate their characteristics as mobile players who spend a great deal of time running up and down the court during the game, with or without the ball. In contrast, the FLP are usually taller and heavier (see Table 2), and are required to move in a relatively smaller area near the baskets. These players usually hold the ball for only brief periods, and rarely dribble. As was seen in the present study, the dribbling advantage of the BLP compared to the FLP was more prominent in maximal sprints when dribbling skills are more difficult. However, the differences in the player's physique and skills between BLP and FLP probably exist at all levels. Parr, Hoover, Wilmore, Bachman, & Kerlan (1978) reported significant differences between the height and weight of 15 guards (188 ± 10.3 cm and 83.6 ± 6.2 kg), 15 forwards (200.6 ± 5.0 cm and 96.9 ± 7.3 kg), and five centers (214 ± 5.2 cm and 109 ± 13.8 kg), all professional basketball players from the American NBA. The authors also reported significant differences in the VO₂ max levels between the guards (50.0 ± 5.4), forwards (45.9 ± 4.3), and centers (41 ± 4.9 ml/kg/min). Similar results were also found in 60 elite Serbian basketball players (Ostojic et al., 2006). Although the physical characteristics (and probably the skills) of these professional players are different from the participants of the present study, consistent with

our findings, FLP still differ from BLP. We anticipated that the decrease in FS and TS between RST without and with dribbling will be significantly greater in FLP, however, there were no significant differences between the groups. It is possible that significant differences were not found in the present study due to the relatively small sample size, which also limits generability of the results.

Conclusions

The addition of a cognitive element and the changes in running mechanics due to dribbling had a significant detrimental effect on running time, but not on performance decrement, in both a single maximal short sprint and in a series of maximal short sprints. The significant higher heart rate and blood lactate levels following the RST without dribbling compared to the RST with dribbling suggest that the energy cost of the muscular and metabolic systems due to a faster run is greater than the added energy cost due to the less efficient running mechanics that characterize dribbling. The very high correlation between FS and TS time in RST both with and without dribbling suggests that dribbling skills play less of a contributing role to running speed with a ball than maximal sprint speed.

We recommend that since dribbling reduces speed, training sessions that are designed to develop power, speed, or speed endurance would be more effective if performed separately without the use of balls. The lower physiological responses that characterize sprint dribbling allow longer training sessions before fatigue occur. This extra practice time should be used by coaches to improve team tactics and to enhance stamina, technique, and ball skills of the players.

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Coaches' satisfaction with their athletic partnerships

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Abstract

Coaches play a key role in the development of athletes, and the close relationships that they form can have a profound impact upon both partners (Jowett, 2007). One factor that has been linked with the quality of that relationship is satisfaction, a positive affective state based upon evaluation of related experiences. However, although athlete satisfaction has long been accepted as an important factor in performance (Chelladurai & Riemer, 1997), the area of coach satisfaction remains relatively unexplored. The present study explored the association between coach satisfaction, as measured by the adapted Athlete Satisfaction Questionnaire (Riemer & Chelladurai, 1998), and coaches' perceptions of the quality of their relationships with their athletes, as measured by the Coach-Athlete Relationship Questionnaire (Jowett & Ntoumanis, 2004). The results of these analyses showed that while relationship quality was a significant predictor of variance in coach satisfaction, different elements of the relationship influenced satisfaction to varying degrees. While relationship quality is evidently a factor in coach satisfaction, it is a complex, interdependent association that needs further exploration. Coach satisfaction remains an under explored area and an important line of future enquiry.

Keywords: relationship, satisfaction, coaching

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Introduction

Satisfaction is an important psychological concept related to the fulfillment of an individual's expectations. Satisfaction can be multidimensional, covering such things as satisfaction with work, relationships, or other personal experiences such as involvement in sport. Defined as a positive affective state based upon an athlete's evaluation, conscious or unconscious, of their sport experiences, athlete satisfaction has long been held to be an important indicator of the success and effectiveness of the athlete and their athletic programme (Chelladurai & Riemer, 1997). It has been linked with numerous factors including coaching behaviours (Chelladurai, 1993), coach-athlete relationship quality (Jowett, 2007), and performance (Riemer, 2007). If athlete satisfaction is an indicator of success and effectiveness, and is also linked to the relationship they have with their coach, then it seems reasonable to suggest that coach satisfaction is also an important factor.

Coach satisfaction is defined here as a positive affective state of the coach, based upon their evaluation of the processes and products of their coaching experiences. As such it can be seen as an indicator of the effectiveness and success of these experiences. As well as this, satisfaction with one's work role has been strongly linked with increased effort and positive attitude in the workplace (Mount, Ilies, & Johnson, 2006; Saari & Judge, 2004). Jowett (2008) has shown a similar effect in coaching; establishing that coach satisfaction is positively associated with coaches' levels of motivation. Furthermore, Weiss, Barber, Sisley, and Ebbeck (1991), and Stevens and Weiss (1991), have both described coaches reporting satisfaction with working with athletes, as well as the enjoyment associated with working with them, as a major incentive for effort and continued involvement in coaching.

Coaches play an essential role in the performance and effectiveness of their athletes. They direct their athletes' growth physically, technically, and psychologically, through their knowledge and experience (Lyle, 2002). Jowett and Meek (2000) have suggested that it is not unusual for coaches and athletes to form close relationships with a high degree of interaction and reliance upon each other. This is manifested in the interdependence of the coach's and the athlete's affect, cognition, and behaviours (Jowett, 2007), and what either the coach or athlete thinks or feels may influence the other. As such, the success and effectiveness of one is likely dependent on the success and effectiveness of the other. Therefore, not only is coach satisfaction a potential indicator of effort, and the success and effectiveness of the coach's experiences, it is also an indicator of the success and effectiveness of their athletic relationship.

In their integrated research model of the coach-athlete relationship, Jowett and Poczwardowski (2007) have suggested that important outcomes of this interaction and interdependence include the coach's satisfaction with both themselves and with their athletic relationship. That is, how the

coach and athlete interact and relate to each other will influence the quality of their relationship, and hence how the coach perceives their own and the athlete's contributions to that relationship, which in turn influence their satisfaction with these experiences. Supporting this, Weis et al. (1991), as well as reporting coaches satisfaction and enjoyment as a positive incentive, also found that a perceived negative relationship with an athlete could lead to reduced satisfaction in a coach, acting as a disincentive.

According to Jowett (2007), coaches perceive the quality of their coach-athlete relationship via two perspectives; the direct-perspective, which encompasses how the coach perceives their self and their relationship (e.g., "I trust my athlete"), and the meta-perspective which encapsulates how the coach perceives their athlete sees them (e.g., "My athlete trusts me"). Findings from a series of interviews (Jowett 2003; Jowett & Meek, 2000) have indicated that coaches who hold positive views of their athletes and who believe that their athletes hold positive views about them appear to be more satisfied with their relationship. Additionally, Lorimer and Jowett (2009) have shown that coaches' meta-perspectives of their coach-athlete relationship are positively associated with coaches' satisfaction with the way athletes act personally towards them (e.g., "I am satisfied with the friendliness of the athlete towards me").

Despite its potential importance, coach satisfaction is an under explored area and has received little direct attention in coaching and sport psychology literature. As such, it is a priority area of research for those interested in coaching and the coaching process. No work at this point has considered coaches' direct and meta-perspectives of their relationship in regards to multiple facets of coach satisfaction, such as satisfaction with the training and instruction being provided, and satisfaction with the performance of the athlete. Establishing such an association is important as it would support the supposition that coach satisfaction is an indicator of the success and effectiveness of coaches' experiences and their athletic relationship. As well as this, establishing an association between coach satisfaction and the perceived quality of the coach-athlete relationship could lead to the development of interventions to help increase satisfaction, and hence, effort and potentially performance.

Coach satisfaction and how coaches perceive the quality of their coach-athlete relationship would theoretically appear to be strongly associated. Relationship quality can be seen as an indicator of the success and effectiveness with which a coach and an athlete interact, while coach satisfaction is an indicator of a coach's positive evaluation of this process and its outcomes. As such, it is predicted that the quality of the coach athlete relationship will be positively associated with coach satisfaction.

Method

Participants

Participants were 120 coaches working in the United Kingdom (102 male, 18 female, M age = 31.72, $SD = \pm 11.20$), and recruited from a range of team ($n = 72$, 60%) and individual sports ($n = 48$, 40%). Coaches had been involved in coaching athletes for between 1 and 32 years ($M = 9.58$ years, $SD = \pm 8.38$), and had been working with their athlete for between 1 and 16 years ($M = 2.04$, $SD = \pm 3.27$). Coaches categorized their performance level as follows: regional ($n = 78$: 65%), national ($n = 18$: 15%), and international ($n = 24$: 20%).

Instruments

Satisfaction. Coaches' satisfaction with different aspects of their coaching experiences was assessed using an adaptation of the Athlete Satisfaction Questionnaire (ASQ; Riemer & Chelladurai, 1998). The original ASQ asks athletes to rate their satisfaction with a list of items using a 7-point scale (e.g. "The friendliness of the coach towards me"). The adapted version consists of the simple change of replacing the word coach with athlete (e.g. "The friendliness of the athlete towards me"). The original scale has 15 subscales dealing with a range of issues such as satisfaction with medical support, external agents, training, and performance. This adapted version, used previously by Jowett (2008) consists of an inventory of items that make up three of the subscales that are directly relevant to the relationship between the coach and the athlete; 3-items refer to Performance, a coach's satisfaction with their athlete's performance, 5-items refer to Personal Treatment, a coach's satisfaction with how the athlete acts towards them, and, 3-items refer to Training and Instruction, a coach's satisfaction with the training that they provide for the athlete. Inter-item reliability for this adapted questionnaire ranged from .74 to .90.

Relationship Quality. Coaches' perception of the quality of their athletic partnership was assessed using the direct-perspective (Jowett & Ntoumanis, 2004) and meta-perspective (Jowett, 2009) Coach-Athlete Relationship Questionnaire (CART-Q). The direct-perspective CART-Q asks participants to rate their disposition towards their athletic partner in regards to a list of items using a 7-point scale (e.g., "I am committed to my athlete"). The meta-perspective CART-Q uses the same items but asks what the coach believes their athletes' dispositions are (e.g., "My athlete is committed to me"). Each questionnaire has 11-items making up three subscales; 4-items refer to Closeness, a coach's expressions of mutual liking, trust, and respect, 3-items refer to Commitment, cognitive interdependence and expressions of a future together, and 4-items refer to Complementarity, behavioral interdependence or co-operative behaviors. Inter-item reliability ranged from .82 to .85.

Procedure

Coaches were approached in a variety of forms, including telephone, letter, and email. Participants were invited to take part in an investigation examining the quality of the coach-athlete partnership. There were two criteria for coach participation: (a) that they were at least 16 years of age, and (b) they were engaged in the coaching of athletes involved in organized competition. A description of the study's main aims was supplied to all participants, as was information related to confidentiality and the voluntary nature of the study. Coaches that agreed to participate were either sent or given a survey pack containing instructions, an informed consent form, a questionnaire, and blank envelope to return the questionnaire. Questionnaires were anonymous and consisting of the two psychometric measures discussed above, as well as questions regarding demographic information.

Results

Mean and standard deviations for all variables are presented in Table 1. Reported scores for the CART-Q are consistent with those in previous studies using this instrument (e.g., Jowett & Clark-Carter, 2006). Table 1 also shows a correlation matrix of the study variables. As expected, all variables were significantly correlated with each other with the highest r values evident between the subscales of the CART-Q.

For the main analysis, each satisfaction variable was used in turn as the dependent variable and regressed first on the 3 direct-perspective coach-athlete relationship quality variables of the CART-Q, and then the 3 meta-perspective variables.

The direct-perspective predicted a significant proportion of the variance in satisfaction with Training and Instruction, $R^2 = .15$, $F(6, 116) = 6.83$, $p < .01$, Performance, $R^2 = .14$, $F(6, 116) = 6.50$, $p < .01$, and Personal Treatment $R^2 = .28$, $F(6, 116) = 15.03$, $p < .01$. The meta-perspective also predicted a significant proportion of the variance in satisfaction with Training and Instruction, $R^2 = .12$, $F(6, 116) = 5.18$, $p < .01$, Performance, $R^2 = .17$, $F(6, 116) = 7.64$, $p < .01$, and Personal Treatment $R^2 = .34$, $F(6, 116) = 19.93$, $p < .01$.

For Training and Instruction the variable Direct Complementarity significantly predicted satisfaction, $\beta = .35$, $t = 3.30$, $p < .01$, as did Meta Closeness $\beta = .34$, $t = 2.10$, $p < .05$. For Performance both Direct Closeness, $\beta = .25$, $t = 2.05$, $p < .05$, and Meta Commitment, $\beta = .34$, $t = 2.29$, $p < .05$, significantly predicted satisfaction. Finally, for Personal Treatment both Direct Commitment, $\beta = .31$, $t = 3.23$, $p < .05$, and Direct Complementarity, $\beta = .28$, $t = 2.91$, $p < .05$, as well as Meta Closeness, $\beta = .46$, $t = 3.32$, $p < .05$, significantly predicted satisfaction.

Table 1. Correlation and descriptive statistics

Variable	1	2	3	4	5	6	7	8	9
<i>Coach Satisfaction with:</i>									
1. Training and Instruction	-	.28	.43	.23	.25	.36	.34	.28	.26
2. Performance		-	.37	.35	.26	.26	.33	.40	.34
3. Personal Treatment			-	.41	.44	.42	.58	.51	.46
<i>Relationship Quality</i>									
4. Direct Closeness				-	.56	.59	.50	.56	.67
5. Direct Commitment					-	.32	.65	.80	.47
6. Direct Complementarity						-	.61	.51	.72
7. MetaCloseness							-	.81	.73
8. MetaCommitment								-	.67
9. MetaComplementarity									-
Mean (N = 120)	5.26	5.34	5.51	5.83	5.41	5.80	5.29	5.08	5.50
Standard Deviation	.75	.73	1.01	.81	.85	.60	.83	.95	.74

All correlations were significant, $p < .01$

Discussion

Findings indicate that each of the three dimensions of coach satisfaction assessed were associated with different subscales of the measure of relationship quality. The variable, Training and Instruction, a coaches' satisfaction with the training that they provide for the athletes, was associated with Direct Complementarity, the coaches' perspective of their own co-operative behaviors, and Meta Closeness, the coach's perspective of the athlete's positive affect. It is unsurprising that Direct Complementarity is strongly associated with Training and Instruction. This form of satisfaction is directly related to coaches' positive evaluation of their own behaviors towards the athlete, and Direct Complementarity is the coaches' assessment of how cooperative they are towards their athletes. Additionally, Jowett and Cockerill (2003) have shown that athletes who perceive their coaches as providing sufficient 'guidance' experienced more trust and respect for their coach. Therefore, accurate Meta Closeness, the coaches' perspectives of their athletes' closeness towards them, is likely an indicator of the success of the training and instruction coaches have provided. The more successful the training, the greater the value athletes placed on coaches' knowledge and experience.

The variable, Performance, coaches' satisfaction with their athlete's performance, was associated with both Meta Commitment, the coaches' perspective of athletes' dedication to their athletic relationships, and Direct Closeness, the coaches' perspective of their own liking, trust, and respect for their athletes. The first of these may be directly related to coaches' expectations of their athletes. Lyle (1999) has found that senior coaches strongly emphasis effort and

determination from athletes in training sessions, and reward for that effort, as opposed to simply performance. Even if a coach perceives that performance to be low, a high commitment would indicate that the athlete was trying their best. Hence, if a coach views an athlete as highly dedicated to their relationship, and hence, by inference, to their training and performance, then the coach is likely to be satisfied with that performance.

A weaker association was also shown with Direct Closeness, suggesting that the more coaches liked and respected athletes the more satisfied they were with their performance. This could be due to high levels of closeness being related to high levels of commitment. For example, an athlete works hard and is highly committed, hence the coach respects and likes them, and therefore as that hard work is reflected in performance, direct closeness appears to be associated with satisfaction. Conversely, it may also be that high levels of closeness bias coaches, leading them to be more satisfied with athletes that they are closer to. Further investigation is needed to establish the exact nature of these associations and any possible mediating effect they may have on each other.

Finally, the variable, Personal Treatment, coaches' satisfaction with how athletes act towards them, was associated with Meta Closeness, coaches' perspective of the athletes' respect, liking and trust towards them. Additionally it was associated both with Direct Commitment, the coaches' perspective of their own dedication to the future of the athlete, and Direct Complementarity, the coaches' perspective of their own co-operative behaviors.

Personal Treatment refers to coaches' positive evaluation of how athletes act towards them and it is therefore unsurprising that is associated with their Meta Closeness, as this relates directly to coaches' perceptions of how the athlete views them. In an interview with a long-term coach-athlete dyad, Jowett (2003) showed the importance the coach placed on the respect of their athlete (e.g., "You need to earn the respect of your athletes..." Jowett, 2003, p. 451). Jowett (2003) suggested that it is a lack of this positive closeness that led to the coach becoming frustrated and that this can lead to conflict in a coach-athlete relationship.

The association between Direct Commitment and Direct Complementarity, and Personal Treatment may be one of 'you get what you give'. In their survey of coaches, Lyle (1999) showed that coaches listed partnership and cooperation as a primary focus of their own coaching philosophy and coaching behaviours. It may therefore be that the coaches' satisfaction with how the athlete responds to them may be influenced by how much they believe they themselves have put into their relationship. Additionally, Direct Commitment and Direct Complementarity may be a direct indicator of how much effort the coach has made with the athlete, the more effort they have put in the more likely that athlete is to respond favourable towards them, and the more satisfied the coach is likely to be with that response.

Looking at these findings from a practical perspective, they suggest that coach satisfaction

is to a degree dependent on how coaches perceive the quality of their coach-athlete relationship; with the direct perspective being more closely related to coaches' satisfaction with their own contribution, and the meta perspective being more strongly associated with coaches' satisfaction with athletes or their interaction with them. Therefore, interventions that target relationship quality or coaches' perceptions of it will lead to increased satisfaction and increased effort in regard to that relationship. The association between coach satisfaction and their relationship is particularly strong in regards to their satisfaction with how athletes act personally towards them, making this an important area of consideration. It is essential then for coaches and athletes to take time to develop an athletic relationship that is not exclusively focused on instruction and training for sport. There is a growing base of evidence in the literature that highlights the value of creating a positive and effective interpersonal environment between coaches and athletes (see Jowett, 2007). The development and maintenance of this environment has been shown to reside in the style, type, amount, and frequency of communication between coaches and athletes (Rhind & Jowett, 2008). From an applied viewpoint, it would seem that coaches would do well to interact with their athletes beyond the technical instructions dictated by their role and their sport. Thus, time should be allocated outside of training sessions, or instruction made more interactive within the training session, to allow for general conversation and social interaction.

The objective of this paper was to investigate the potential association between coach satisfaction and coaches' perceptions of the quality of their coach-athlete relationship. The analysis of the obtained data indicated coaches' perceptions of their relationship accounted for between 12% and 32% of the variance in their satisfaction. Hence, despite the significant proportion of the variance in satisfaction accounted for, there remains a large proportion of unexplained variance. It seems likely then, that while relationship quality is an important and major contributor to coach satisfaction it cannot fully explain this phenomenon. A coach's relationship with their athlete is complex and multifaceted and can vary in terms of professionalism, objectives, and methods. As such coaches will be influenced by a range of intrinsic and extrinsic motives related to their relationship with their athlete. While some coaches may be mostly concerned with the relationship itself, or the effectiveness with which they work with their athletes, others may be more concerned with monetary or other extrinsic rewards (Jowett, 2008). These extrinsic motivations, as well as other intrinsic factors such as personal development, may account for this unexplained variance. Additionally, in situations where intrinsic motivations are particularly low, it has been suggested extrinsic factors may actually undermine coaches' intrinsic motivation (Jowett, 2008).

Future research should focus on establishing a causal relationship between coach satisfaction and how they interact with their athletes. The correlational nature of this study does not allow for these direct causal inferences to be made. Future projects should include experimental and

longitudinal designs, and the direct observation of coach-athlete interaction. This would be beneficial as patterns of influence and change could be established allowing for greater theory building and intervention development. This can be addressed by broadening the independent variables being examined (e.g., including extrinsic factors such as pay or job prospects), or comparing different samples of coaches (e.g., separated by sport-type, performance level, qualification level), and by looking at individual factors (e.g., gender, age, social background, personal experiences) that will in turn provide a more complete picture of coach satisfaction.

While athletes have traditionally been the centre of focus for researchers in sport psychology, it is increasingly being acknowledged that the way in which they interact with their coach can have a profound impact upon their effectiveness and success (Jowett & Poczwadowski, 2007). Yet despite this, there is still an overall dearth of research that addresses important psychological issues related to coaching and from coaches' perspectives. Research exploring these issues is important as it expands our knowledge of coaching and coaches' roles in terms of their needs, efforts, and attitudes. Satisfaction is a particularly important area, being closely associated with motivation and performance in the workplace. Building our knowledge of this area will allow us to continue to develop coaching as a profession, helping create positive environments in which coaches and athletes work, increasing both their effectiveness and success.

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Reaction-Time Training for Elite Athletes: A Winning Formula for Champions

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Abstract

Sports skills can be divided into two distinct categories: (1) reaction-time (RT) based sports skills, and (2) non reaction-time based sports skills. RT based sports skills refer to those skills that require athletes take actions based on external stimuli, e.g., upcoming curve ball, opponent's dribbling, striker's shooting, attacker's kick, etc. According to Wang, (2007), shortening RT of responding to external stimuli should be one of the central focuses of high-level training. The purpose of this paper is to: (1) analyze the characteristics of high-level competition, (2) explain how and why RT can positively or negatively affect sports performance at elite level, and (3) provide the specific training strategies of how to shorten RT during competition. The introduced training strategies can be used to maximize athletes' performance in elite competition.

Keywords: reaction-time, non reaction-time, external stimuli

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Introduction

Sports skills can be divided into two distinct categories: (1) reaction-time (RT) based sports skills, and (2) non reaction-time based sports skills. RT based sports skills refer to those skills that require athletes take actions based on external stimuli, e.g., upcoming curve ball, opponent's dribbling, and offender's shooting, attacker's punch, etc. Without external stimuli, athletes are unable to make decisions and respond to attacks of opponents (Wang, 2004; Wang, 2007). For example, sports such as soccer, basketball, volleyball, boxing, tennis, football, baseball, or ice hockey are considered RT based sports skills. The actions that athletes perform, at a particular moment in competition, depend on external stimuli, e.g., opponents' actions, position of teammates, location of the balls, flow of the game, etc. In RT based sports, athletes are unable to pre-determine what actions they will make in advance. Instead, before taking an action they must rely on immediate external stimuli. Thus, during competition athletes' RT is a deciding factor that determines success in competition (Rosenbaum, 1980; Ward, Williams, and Bennett, 2002; and Williams, Ward, Smeeton, & Allen, 2004).

Conversely, non RT based sport skills are found in such sports as the high jumping, long jumping, gymnastics, figure skating, disc-throwing, swimming, diving, and weight-lifting. To perform these skills well, athletes must pre-determine how and what to do in competition, i.e., they must develop a plan of action before competition begins. Since athletes do not rely on external stimuli before making immediate decisions in competition, there is no RT involved. In fact, apparently, from our traditional textbook of motor learning, these two types of motor skills are divided into open motor skills (RT based motor skills) and closed motor skills (Non RT based motor skills) and the weaknesses of such classifications are too abstract that leaves coaches, athletes and practitioners with a great wonder of true meanings of these two types of motor skills. Conversely, a major advantage of dividing motor skills into RT and non RT based motor skills is that the new names accurately capture the true characteristics of each of these two types of motor skills so that coaches, athletes and practitioners can purposefully provide effective training for athletes based on the type of sports.

Many coaches have spent a great deal of time, energy, and resources training their athletes in hopes of helping them reach their peak performance. Frequently, coaches are satisfied with performance of their athletes in practice, but not necessary in competition. A performance discrepancy between practice and competition has been a long time issue that leaves coaches with many unanswered questions (Wang, 2005). Thus, coaches try to ascertain the causes of such a performance gap between practice and competition in hopes of seeking solutions or answers.

According to Wang, (2004, 2005, 2007), shortening RT of responding to external stimuli should be one of the central focuses of high-level training. Coaches and practitioners should have

a comprehensive understanding of how and why RT largely contributes to the success of athletes in competition. To ignore or be unaware of the role of RT training, athletes could easily compromise their performance in high-level competition. With this thought in mind, the purpose of this paper is to: (1) analyze the characteristics of high-level competition, (2) explain how and why RT can positively or negatively affect sports performance at elite level, and (3) provide the specific training strategies of how to shorten RT during competition. Hopefully, this information may help coaches, athletes and practitioners have a clear and comprehensive understanding of their existing training flaws so that they may be able to re-structure their training methods effectively to fill practice/performance gap.

Characteristics of High-Level Competition

When carefully reviewing the characteristics between intermediate and high-level competition, some interesting and unique phenomena appear. The following information illustrates the imperative features of high-level competition for RT based sports.

Quickly Reaction to Unpredictable Game Situations

One of the major characteristics of RT based sports competition is that athletes must rely on external stimuli before making a response and yet; such external stimuli are unpredictable. The unpredictable actions of opponents are a great challenge for defending because the brains of athletes need to process external information and then take actions. All these mental activities require time, which is referred to RT. Thus, the success of athletes who respond to attacks of opponents is largely determined by how quickly they can make decisions based on immediate unpredictable game situations. Obviously, highly skilled movements of opponents will be less predictable and present greater challenges for defenders. Therefore, how to quickly encounter opponents' unpredictable offensive play in competition has been an imperative focal point of training. Without proper training, the brains of athletes cannot process external information, make decisions and take actions with a timely fashion. Unfortunately, any hesitation, even a flash of the second, could lead to a chaotic situation. Thus, for RT based sports, reacting to unpredictable actions of opponents is one of the major characteristics of high-level competition (Wang, 2007; Wang, 2005).

Extremely Fast Speed

Due to the competitiveness of opposing teams, the second characteristic of high-level

competition is the fast pace of competition, which limits the athletes' available time for decision-making. The higher the level of competition is, the faster the competition is. That is why many teams can achieve success at lower levels of competition, but not in elite levels. According to Fitt's speed/accuracy trade-off theory (1954), if athletes want to have accuracy, they slow the actions; if athletes want to have fast speed, they will compromise accuracy. The major reason for the speed/accuracy relationship is that athletes have only certain ability to process game information within a particular time limit. If available decision-making time is too short, performance of athletes will be compromised (Rosenbaum, 1980; Ward, Williams, and Bennett, 2002; and Williams, Ward, Smeeton, & Allen, 2004).

For example, a boxer could be knocked down because he delayed responding to an attack by an opponent. Likewise, a soccer goalie could have a goal scorer on him/her because of a slight hesitation in catching the ball. In addition, a basketball player's pondering at a critical time could cause his/her team to lose by one point during the final second of the competition. Based upon empirical evidences (Wang, 2007), rapid speed of competition significantly cuts down the RT of athletes.

According to the above analysis, it is clearly evident that uncertainty of an opponent's action and rapid speed of competition negatively affect the decision-making ability of athletes. As a result, performances of players are often unsuccessful. Thus, shortening RT of athletes may be a decisive factor of win/loss outcome (Rosenbaum, 1980; Ward, Williams, and Bennett, 2002; Williams, Ward, Smeeton, & Allen, 2004 And Wang, 2007).

During practices or scrimmages, win/loss records are less important and athletes usually unconsciously play games in a more relaxed atmosphere and speed of competition is relatively slow. With a consistent pattern of such a practice, the ability of athletes to respond to game situations will significantly decline. Thus, a performance gap between practice and competition becomes unavoidable. Coaches and practitioners must understand the roots of the problems and design training regimens to remedy this problem.

High Pressures with Multiple Defenders

In addition to the above, today at high-levels of competition, defenders are more assertive and more physical. For example, as soon as an athlete gets the ball, multiple defenders immediately put huge pressures on him/her in hopes of disrupting or taking the ball away from the offender (Wang, 2004).. Due to tremendous running involved, this style of play requires defenders with great physical conditioning. Pressing opponents has become a popular strategy at high-level of competition. Therefore, how offenders develop their ability to compete under large pressures, with multiple opponents, is another challenge at high-level competition.

Finish Actions with Limited Space

Because defensive lines become more competitive with more defenders and higher pressures, available space for an offender to maneuver becomes smaller. If offenders want to penetrate defense-lines or beat opponents with limited available space, they must have well-around abilities to work in limited space, i.e., precise-timing, sudden pace change, realistic fake movement, and proper fast action (Wang, 2007). To achieve peak performance, coaches and practitioners must structure training according to the characteristics of high-level competition. Athletes must be taught how to mentally and physically prepare themselves for the challenges associated with performing at elite levels of competition.

Importance of RT Training for Elite Athletes

When elite athletes are competing in high level competition, these athletes must react to game situations with encountering the above four characteristics. Needless to say, elite athletes' RT plays significant role of reacting to unpredictable stimuli with very fast pace of competition. Without fast RT, elite athletes are unable to obtain game advantages for fighting balls or blocking opponents' attacks. Likewise, elite athletes' RT also plays crucial role of successfully encountering high pressure with limited space to timely maneuver ball or take proper actions in high level competition. Therefore, the above four characteristics of high level competition present a great demand for elite athletes to have very fast RT in order to achieve peak performance. Unfortunately, many coaches and elite athletes are not necessary to understand the importance of RT training. As a consequence, these athletes would lose competitions due to slight delays of reacting to game situations. For example, boxing athletes, soccer goalies, basketball defenders, ice-hockey players can lose competitions with a slightest delay reacting to opponents' attacks at a critical moment. Thus, the RT training should be treated as a priority for high level training for elite or Olympic athletes.

Structures of Reaction-Time

According to the aforementioned principles, needless to say, RT plays a significant role in contributing to sports performance at high-levels of competition. To effectively shorten RT of athletes in competition, the following information illustrates and analyzes RT components. This information will enable coaches to structure practice sessions to help players shorten RT.

RT is the time interval from when an athlete sees or hears external stimuli to the point in which the athlete's muscles start to engage in a movement. This time delay is referred to as RT (Insert Table 1 here):

Table 1. Reaction-Time Model

Pre-Motor Time(Cognitive Time)			Motor Time
Information Processing Stage			Initiation of a Movement
Detection of Game Situation Stage	Decision-Making Stage	Programming Stage	Time for Overcoming Inertia to Initiate a Movement
Factors of Affecting This Stage of RT	Factors of Affecting This Stage of RT	Factors of Affecting This Stage of RT	Factors of Affecting Motor Time
(1) Clarity (Sharpness) of the color of the stimulus. (2) Intensity (Brightness) of the color of the stimulus. (3) Contrast of background and stimulus. (4) Patterns of the movement (5) Loudness of sound. (6) Feelings of touches.	(1) Uncertainty or unpredictivity of game situations. (2) Potential ways of attacks or counter-attacks. (3) Compatibility between attacks and responses.	(1) Complexity of technique. (2) Level of accuracy.	(1) Weight of the moving limbs or body parts. (2) Age of the athlete. (3) Genetic makeup of the nerve system.

From Table 1, we can see that RT can be divided into two categories: (1) pre-motor time, and (2) motor time (Schmidt & Wrisberg, 2008). The pre-motor time, also refers to as cognitive time, can be changed or shortened with proper training. Motor time is defined as the time it takes to overcome inertia of initiating a movement. The central issue of training is to focus on the strategies of how to shorten the pre-motor time (cognitive time or decision – making time) instead of motor time. The three distinct stages or elements of pre-motor time are shown in Table 1 and Table 2. Coaches and practitioners should design training procedures to decrease RT from each of these three information processing stages (Schmidt & Wrisberg, 2008).

Table 2. Information Processing Model of Pre-Motor Time of Reaction-Time

Detection of Game Situation Stage	Decision-Making Stage	Programming Stage
Life Examples	Life Examples	Life Examples
(1) My opponent is pushing the ball to my right side to beat me.	(1) I have to use my right foot to tackle my opponent's ball.	(1) Brain programs the tackle movement and sends the commands to the relevant muscles for an action.
(2) My opponent is punching the left side of my face.	(2) I must use left forearm to block the opponent's attack.	(2) Brain programs the tackle movement and sends the commands to the relevant muscles for an action.
(3) My opponent is making a jump-shot to the basket.	(3) I must quickly jump and block his shot.	(3) Brain programs the tackle movement and sends the commands to the relevant muscles for an action.
Training Approaches	Training Approaches	Training Approaches
(1) Color manipulation training for sharpness and brightness of the colors	(1) Compatibility training between opponent's style of attack and defender's response.	(1) Use the simplest, fastest, easiest and most cost-effective skill to complete the actions
(2) Contrast manipulation training between stimulus and background	(2) Rapid speed training	
(3) Sound manipulation training	(3) Training for responding unpredictable stimuli	
(4) Object-shape manipulation training	(4) Anticipation training	
	(5) Simulation training	
	(6) Pressure training	

Strategies for Shortening Reaction-Time

Shortening RT at Recognition of Game Situation Stage

The first cognitive activity an athlete must engage in before making a decision is to detect and understand the incoming external stimuli (Ward, Williams, and Bennett, 2002 and Schmidt & Wrisberg, 2008). For example, where is(are) the opponent(s)? where is the ball? where is (are) my teammate(s)? where is my current position? How fast is the ball coming? Which direction of the ball is coming?

The most important factors in determining the required RT at this stage are sharpness (clarity) and brightness (intensity) of the color of the stimuli as well as the contrast between background and stimuli (Schmidt & Wrisberg, 2008) (See Table 1). For example, detecting a soccer player's actions with a green colored uniform is more difficult compared to detecting a player's actions with a white colored uniform. This is because the actions of a soccer player

with a green colored uniform on green grass of soccer field create a poor contrast between stimuli (green colored uniform) and background (green soccer field). Thus, opponents require a longer RT. Likewise, at night time, martial arts masters who wear black outfit can lengthen opponent's RT to respond to the attacks of martial arts masters because of a poor contrast between the black outfit and the dark-colored sky. With this principle in mind, coaches can manipulate colors of objects, background, uniforms, field, sports equipment, and lightening to change sharpness, brightness, and contrast between the stimuli and background to shorten or lengthen RT at the detection of game situation stage (See Table 2).

Volume of sounds created in actions also have a deciding impact on RT for sports such as defending opponents' attacks from behind the body or avoiding opponents' tackling from behind the body in soccer competition. In conclusion, athletes always want to find the ways to lengthen RT of opponents and shorten their own RT.

Shortening RT at Decision-Making Stage

After athletes recognize actions of opponents, position of teammates, ball location, game development or other external stimuli, the athletes must quickly make decisions about how to take actions in responding to immediate game situations. There are several factors that influence decision-making time, e.g., (1) predictive level of immediate game situations. For example, if a martial arts master can use multiple fighting styles, e.g., boxing, wrestling, kicking, judo, and other martial arts techniques, his/her opponents require more decision-making time to respond to the martial arts master's various unpredictable actions. In other words, once uncertainty level enhances for fighting, an opponent's RT consistently increases as well (Merkel, 1885; Woodworth, 1938; Hyman, 1953; and Hick, 1952). Likewise, a soccer defense player requires more decision-making time to block an offender who has 20 different ways of making fake-movements compared to the blockage of an offender who has only two ways of beating an opponent. Thus, offenders or attackers need to learn as many techniques as possible to enhance uncertainty level of fighting in order to force opponents to lengthen their decision-making time of responding. Thus, when options of attacking styles increase, opponents' RTs increase as well (Leonard, 1953; Schmidt, 1968).

Conversely, defenders should proficiently learn all different ways of defending or blocking the versatile attacks of offenders. The more familiar athletes are with different attack styles, less decision-making time is needed to defend or block attacks of offenders. Hence, for defense purposes, more practice time of fighting with various attack styles of opponents is necessary to reduce decision-making time (See Table 2).

Another factor influencing decision-making time is the compatibility between attack (external

stimulus) and defense (response). If an external stimulus and a response are more compatible, less decision-making time is needed for defending, and vice versa (Rosenbaum, Vaughan, Barnes, & Jorgensen, 1992; Rosenbaum, Van Heugten, & Caldwell, 1996). For example, a left handed table-tennis player's serves create spins that require more decision-making time for a right handed opponent's response. This is because the spin of the ball coming from the left handed player is opposite to the spin of the ball created by the right handed player. Similarly, fighting against a martial arts master opponent who is left handed or a left footed requires more decision-making time for a right handed or a right footed master. Research repeatedly demonstrates that compatibility between stimulus and response plays a significant role in determining decision-making time when fighting between two opposing athletes or teams (See Table 2).

Many training strategies can be arranged to reduce decision-making time when facing incompatible external stimuli. For example, simulation training – if a right handed tennis player wants to beat a left handed opponent, they must structure simulation training procedures so that during practice sessions right handed players gradually get used to the styles and characteristics of left handed players. By doing so, athletes can shorten their RT in competition when the actions of opponent are not compatible with their responses. Consistently, if boxers (who can only use their fists to fight) want to beat Chinese martial arts masters who can use every parts of their bodies to fight, the boxers must structure proper training to enhance their abilities, i.e., not only to use their fists, but also use their legs or any other parts of their bodies to fight. The above procedures are the only way of reducing RT to effectively fight with the opponents whose attacking styles are incompatible to boxers. Obviously, simulation training provides athletes with great opportunities of creating motor skill imagery in practice similar to the required neuro mechanisms with the processes used in athletes' motor control of real competition (Decety and Jeannerod, 1996). In sum, the advantage of simulation training is to imitate the real styles and characteristics of opponents to make unfamiliar or incompatible external stimuli compatible.

With team sports competition, it is imperative to structure training, which includes versatile styles of opponents because each team has its unique style of play or competing. The more practice a team can engage in fighting with various styles of opponents, the shorter RT a team member needs to compete with opponents in competition. For example, a soccer team not only needs to play with opponents from South American teams, but also, they should play against opponents from European countries. To be effective, training must include the intensity and style similar to real competition.

Another effective training approach that may be used to shortening RT is to speed up pace of practice. For example, basketball or soccer coaches may set practice rules for scrimmage games with limited ball-control time, i.e., every player who receives the ball must distribute it as soon as possible. Thus, the player who controls the ball has only very limited decision-making

time for passing or shooting. Also, athletes may play games with over-pressured balls (basketball, soccer ball or volleyball, etc.) that result in faster rebound than regular balls. If implemented well, these procedures will increase speed of practice and, in turn, force athletes to make quicker decisions (Wang, 2007, Wang, 2004).

To reduce RT at the decision-making stage, athletes may also use anticipation skills for an upcoming event or action so that they can make decisions before events start (See Table 2). However, athletes must use precaution when using anticipation strategies for counter-attacking the actions of opponents because they may make fatal mistakes, i.e., makes incorrect anticipations. For example, if a soccer goalie anticipates ball coming to left upper corner of the goal for a penalty shot, he/she may pre-determine to jump to the left upper corner to catch the ball. Thus, as soon as the ball is being kicked, with an advanced anticipation, the goalie can take an action immediately without requiring decision-making time so RT is shortened. But, if the anticipation was incorrect, the ball went to another side of goal post; the goalie will miss the ball totally.

Shortening RT at Command-Giving Stage (Response Programming)

After a decision is made, the athlete must program an abstract concept of a decision into particular actions by sending electrical impulses to the appropriate muscles; this stage refers to as the programming stage. The time needed for this stage is determined by complexity and accuracy requirements of the particular skill (Schmidt & Wrisberg, 2008). For example, when a soccer player tries to beat an opponent, this player can use speed-beating to bypassing a defender. Speed-beating is an easy and very simple skill that does not require faking or executing other complex deceptive movements required, and the offender just needs to push the ball to one side with a sudden kick and accelerate speed to bypass opponents. This type of skill requires a minimum programming time to complete the action. Conversely, longer programming time is required if soccer offenders beat opponents by executing multiple faking swings. Based on the above principles, coaches should teach skills from the simplest to the most difficult ones. After mastering all the sequences of the skill progression, in competition, whenever possible, it is the best way for athletes to use simplest skills possible to minimize programming time to speed up actions (See Table 2). Also, during the programming stage when higher accuracy is required, more programming time is needed (Fitts & Peterson, 1964; Sidaway, Sekiya, & Fairweather, 1995).

Conclusions

For RT based sports, many teams experience a performance gap between practice and

competition. Some athletes with great skills during practice may not excel as in competition. Part of the reason for this void is that their skills are more appropriate for demonstration environments, uncompetitive situations or relatively slow scrimmages. To maximize the potential of athletes in competitive environments, effective coaches or practitioners must understand the nature of the sports they are coaching so that coaches can structure appropriate training procedures. Thus, the central issue of training should focus on how to effectively shorten the RT of athletes so that they may quickly respond to external and unpredictable game situations. With proper training, all three stages of RT can be shortened.

In addition, coaches and practitioners must have a comprehensive understanding of the characteristics of high-level competition and be able to formulate training regiment accordingly. To achieve these worthy goals, coaches and practitioners should regularly update their knowledge bases of using scientific principles to their training. Hopefully, this paper provides some valuable information for coaches and practitioners who desire to enhance performance of their athletes.

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Authenticity in formal coach education: Online postgraduate studies in sports coaching at The University of Queensland

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This paper outlines the postgraduate programs in sports coaching in the School of Human Movement Studies at The University of Queensland (Australia); including its development, underlying philosophy, structure, delivery, effectiveness, and future directions. Coach education and continuing professional development is purported to improve the quality of coaching practice (Cushion, Armour, & Jones, 2003); however, there have been claims (e.g., Cushion et al., 2003; Dickson, 2001; Lyle, 2002; Mallett, Trudel, Lyle, & Rynne, in press; Rynne, Mallett & Tinning, in press) that formal coach education is not a major source for coaches' learning. Recent research into coaches' learning (e.g., Rynne et al., in press) has revealed that although it may not be the major source of learning coaching work it can nevertheless be significant in its contribution. Formal coach education can and does positively contribute to understanding and developing coaching practice if integrated appropriately with coaching work. In this paper we foreground that formal coach education (integrating authentic learning experiences) can facilitate coach development through online learning: *"The program has offered me the opportunity to maximize my expertise, positively transfer new ideas and methodologies to my work and continues to challenge me"* (Master of Sports Coaching student, 2007).

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Evolution of UQ/ASC Sports Coaching Programs

Sport is central to the lives of many Australians and they are passionate about performing well in sport. In 2008, the Federal government reviewed sport in Australia. In their report they highlighted the importance of the coach in the coach-athlete-performance relationship and the significance of investing in the development of high performance coaches in the pursuit of success in the international sporting arena.

The Australian Sports Commission (ASC) is the central national sporting agency. Within the ASC is the internationally-renowned Australian Institute of Sport (AIS; established in 1981) whose primary role is to support significant numbers of Australia's elite athletes and coaches. Another key body within the ASC is the Coaching and Officiating Unit (previously known as the Australian Coaching Council; ACC), which is responsible for the development of coaches, including coach education and accreditation.

In 1991, the ACC embarked on a correspondence coach education program (Graduate Diploma of Elite Sports Coaching) designed for aspiring national coaches across all sports, and in particular the Australian Institute of Sport (AIS) scholarship coaches, who were part of the National Coaching Scholarship Program (NCSP). The correspondence program included many courses (subjects) and the program was delivered through the ASC and the School of Human Movement Studies (HMS) at The University of Queensland (UQ). The mostly external (correspondence) program was supplemented with some face-to-face weekend seminars. Although the Graduate Diploma of Elite Sports Coaching was considered to be an important part of the NCSP there were a few issues that thwarted its effectiveness. First, only a small percentage of coaches completed the awards, generally reflecting the reality of time-poor coaches. Second, each course was not afforded equivalent academic rigor and subsequently differential time demands were experienced in completing the various courses. Third, in some cases the content was considered out of date. Finally, there was a perceived lack of connection between theory and practice.

The aforementioned issues were the catalyst for discussions between HMS (UQ) and the ASC/ACC in 2001 that led to the development of an online tertiary (University) program for AIS scholarship coaches within the NCSP and other aspiring and current high performance coaches. This partnership between two leading organizations of their kind (HMS & ASC) in developing the suite of sports coaching programs has since attracted 319 enrolments (including 43 international students) with 124 graduates since it commenced in July 2002. Several of the 124 graduates have become national and Olympic coaches in their respective sports. In addition to the AIS scholarship coaches (approx. 20 annually), many student-coaches are currently employed in some coaching capacity; for example, assistant coaches in professional sports, institute/academies

of sport, program directors in clubs and schools, and physical education teacher-coaches. Many of the student-coaches are aspiring high performance coaches seeking future employment in professional sporting clubs and institutes and academies of sport.

Significant in the development of the suite of courses was the design of content and assessment within an academically rigorous framework that challenged coaches' thinking about current practices. Courses were designed by leading academics, sport scientists, and high performance coaches from both organisations (HMS & AIS) and some external institutions to ensure an intellectually challenging but authentic learning experience that would facilitate professional knowledge and practice. Several course developers were both academics with significant coaching experience and/or involvement with elite sport.

Philosophy of Sports Coaching Programs

A sound understanding and application of constructivist learning principles within an online environment guided the development of the suite of courses within the sports coaching programs at UQ (Roblyer, Edwards, & Havriluk, 1997). In simple terms, constructivism is a theory of teaching and learning that advocates the active reconstruction of knowledge by students, facilitated by teachers who engage with new information that ultimately scaffolds prior learning and knowledge. Constructivist learning principles recognise that students are not empty vessels and seek to promote active and co-operative learning, critical analysis of information, and interest in learning (McInerney & McInerney, 2002). Implementing these teaching and learning principles is a key tenet of our approach to developing coaches. In the co-construction of knowledge (Vygotsky, 1986) we seek to connect complex theories and concepts to professional practice (praxis) and engage students' learning through connections to their personal experiences (authenticity) – *'I found the course content was applicable to my coaching situation and loved applying the assignments to my coaching situation. This was invaluable and I thank you'* (student feedback - Sport Psychology and the Coaching Process - 2005). Co-construction of knowledge has been achieved through various modes of communication and active participation in authentic learning tasks including assessment, requiring students to engage with learning materials at a personal and professional level.

Coaching knowledge should be considered as professional knowledge and a particular challenge was to develop an academically rigorous curriculum that attracted the interest of coaches and challenged their thinking and behaviours; but which was to be delivered exclusively online. Formal education must accommodate the diversity of needs pertaining to the professional development of coaches and should be fundamentally shaped by curriculum development

activities. In response to this challenge an exclusively online program of teaching and learning was developed accommodating these major constraints.

The interdependent relationships among conceptual knowledge, procedural knowledge and dispositional knowledge underpins the postgraduate programs in coaching at UQ. The programs provide integrated learning experiences that are authentic and designed to develop professional knowledge and skills. Authenticity characterises the learner-centred approach, which enables coaches to connect declarative and procedural knowledge with current coaching practice. The integration of conceptual and procedural knowledge is expressed in the links that are made between what is studied and the current work of the coaches who are enrolled in the programs. The coaches actively engage in the content of the various courses through direct application to their current work practices. The assessment is aligned to the context in which the coach works and negotiation with faculty is encouraged and supported. Moreover, assessment where possible relates to and connects with issues in their coaching practice. The flexibility afforded by the online delivery enables coaches to study within their work requirements both into and around their coaching commitments (e.g., overseas competitions).

Praxis – connecting theory to practice – through assessment is integral to the learning process. Assessment generally examines skills of higher order cognition. Nevertheless, assessment can be purposeful beyond assessing cognition; it can facilitate professional development and independent life-long learning. Several strategies are employed to meaningfully engage students in assessment tasks to augment learning. For example, action research (AR) has been a useful method of engaging coaches to critically examine their coaching practice using different levels of reflection. AR has been credited as a useful method that “deepens and broadens practitioners’ understanding of their work and the subject matter they work with” (Kirk, 1995, p. 4). Kirk highlights six main features of AR, including that it is (a) collaborative, (b) participatory and self-managed, (c) data-based, (d) involves reflection, (e) situated within the broader social context, and (f) reform-oriented. The basic thrust of AR is to improve and/or understand professional practice: *“the intervention has had a positive effect on my coaching and will continue to do so in the future. A very useful and worthwhile course.”* (student feedback - Pedagogies for Coaches - 2003).

Consistent with an authentic learning approach to teaching is the use of reflection, on self and professional practice, throughout all courses. Students regularly reflect on concepts, ideas, theories and research at a personal level to scaffold the ‘new’ information onto ‘old’ information. Van Manen (1977) distinguishes among three different hierarchical forms of reflection – technical, practical, and critical reflection. Initially, students are engaged in the most elementary forms of reflection, but are increasingly encouraged through the progression of their studies to think about connecting theory and practice (praxis) or practical reflection. The highest level of reflection

(critical) challenges taken-for-granted assumptions about practice, including equity and social issues. What the programs aim to produce are more informed and reflective coaches. This comment from one AIS coach, who graduated from the program, provides evidence that the courses are having a positive impact on coaching practice: *"I have always done things instinctively and there were some connections missing. The UQ course has helped to bridge my knowledge gap. I feel more comfortable with the informed decisions that I make because I know the background more completely. Consequently, I am a more confident and a better coach"* (2004 Sports Coaching Graduate). Assessment drives learning and the design of assessment tasks that challenge coaches was key to developing an authentic and meaningful tertiary coach education program: *"Completing and submitting assessment tasks and obtaining results were considered amongst the most enjoyable tasks performed by students undertaking the postgraduate programs"* (dK2 Report, 2004, p. 34).

The Structure of the Sports Coaching Programs

There are three qualifications (awards) offered within the Postgraduate Programs in Sports Coaching; each catering to the broad educational backgrounds of coaches. Entry at all levels requires coaches to have a minimum of five years coaching experience and current coaching involvement. This prerequisite is stipulated as consistent with the authentic learning approach adopted in the program. Each award requires eight units of credit (approximately 500 hours) and students can articulate from one award to the next on successful completion of each subsequent qualification. Coaches without a related degree will enrol firstly in the Graduate Certificate, then upon successful completion can articulate into the Graduate Diploma, and then finally articulate into the Masters degree. Alternatively, upon successful completion coaches can graduate from any of the three awards (e.g., Graduate Certificate). All courses are offered as external part-time study.

Coaches who have completed previous tertiary study that is compatible with the courses outlined in the program (i.e., content and depth of study) can apply for academic credit. The 16-unit Masters is the recommended program for coaches with an undergraduate four-year degree in Physical Education, Sports Science or Human Movement Studies. The Graduate Certificate program was designed to cater for those coaches who did not possess a four-year related degree. Coaches who have undertaken additional study at the postgraduate level can apply for relevant academic credit. This recognizes coaches' learning is an ongoing process where knowledge is built upon previous experience and professional practice. The three qualifications are outlined below:

Graduate Certificate in Sports Coaching

The Graduate Certificate in Sports Coaching is designed for entry-level coaches without a foundational knowledge in human movement studies. This award is very popular for recently retired elite athletes who are making the transition into performance coaching. The five courses within this program offer a broad but focused knowledge base that can be applied to sport specific coaching contexts. This qualification is designed for completion between one and two years. Students can enrol at the commencement of each of the three semesters (February, July, November). The Graduate certificate consists of the following courses, which requires approximately 500 hours study to complete eight units of credit:

- Functional Anatomy and Biomechanics (2 units)
- Skill Acquisition and Movement Analysis (2)
- Contemporary Issues in Coaching (1)
- Exercise Physiology for Coaches (1)
- Sport Psychology and the Coaching Process (2)

Graduate Diploma and Master of Sports Coaching

These awards are designed for coaches with a degree in physical education, sport science or human movement studies or equivalent (including completion of the Graduate Certificate of Sports Coaching) and especially for those planning a career in sports coaching. The Graduate Diploma requires completion of eight units of academic credit (approximately 500 hours of study). A mandatory course in these awards is Pedagogies for Coaches. This year long course offers coaches the tools of self-reflection in order to better understand the coaching process and improve their professional practice. In addition to Pedagogies for Coaches, Graduate Diploma students select another four units from the suite of courses below. In the Master of Sports Coaching award students are offered entry into either the 16-unit or 24-unit program depending upon previous tertiary study. Students with a related three-year qualification (e.g., Sport Science) or other unrelated tertiary qualifications (e.g., Law, Business) enrol in the 24-unit Masters program. Graduates in Sport Science or equivalent enrol in the 16-unit Masters program. Graduates in the Diploma of Sports Coaching are required to complete another eight units of credit from the suite of offerings in the Masters schedule. Coaches can undertake the Masters degree as a full coursework degree, or as a combined coursework with a Project, or a combined coursework and research degree (includes the Thesis and usually Research Skills courses).

Available courses in the Graduate Diploma and Master's schedule include:

- Pedagogies for Coaches (4 - mandatory two semester course)
- Training Program for Elite Athletes (4 - two semester course)

- High Performance Program Management (2)
- Developing the Elite Athlete (2)
- Recovery and Nutrition for Elite Athletes (2)
- Identifying and Developing Talent (1)
- Sports Medicine for Coaches (1)
- Research Skills (2)
- Project (4 – one or two semester course)
- Extended Project/Thesis (8 – two semester course)

The Sport Coaching Programs currently offers 15 online courses available across three semesters. In September 2009, a course in Strength and Conditioning (developed by the University of Edinburgh) will be available to student-coaches in the UQ program to undertake as cross-institutional study. UQ also offers a Graduate Certificate in Sports Coaching (Strength and Conditioning) that includes the Edinburgh course plus the other Graduate Certificate courses, with the exception of Sport Psychology. It is noteworthy that some coaches have enrolled in stand-alone courses, that is, they have studied one or two courses with no intention of completing the full award. As for all students, payment of fees is upfront for each course (subject).

Online Learning and Pedagogical Practice

As mentioned, a critical part in the development of the postgraduate sports coaching programs was the delivery of courses via online learning to cater for the busy lives of coaches. This online environment provided much needed flexibility for formal coach education not previously afforded to part and full time coaches. UQ uses the Blackboard e-learning management system in delivering the sports coaching programs. The process of transforming traditional teaching practices in a face-to-face environment to that of an e-learning environment clearly provided a pedagogical challenge. As discussed previously, a constructivist theory of learning underpinned the development of the suite of courses delivered in an online learning environment.

A student-centred approach, consistent with constructivist learning principles, promoted the use of a range of pedagogical practices in the online environment. Central to each course design is the promotion of active engagement and interaction with the course content as well as regular collaboration with faculty and fellow student-coaches. Rovai (2003) argues the importance of taking into account the diversity of experience of learners when designing online courses. This acknowledgement of diverse adult learners with varying interests, life histories, and engagement in sports and coaching experience, has been recognised and enacted by creating student homepages

in every course to allow coaches to post demographic information for fellow class members to read. This provides the much needed 'ice breaker' for the development of computer-initiated communication and subsequent community of learners in the online environment, which has reduced feelings of alienation: *"I found it a daunting task to communicate on the blackboard not knowing other participants and how my responses/thoughts would be interpreted"* (student feedback - *Pedagogies for Coaches* - 2006). Nevertheless, a 'community' does not simply develop and it is the role of each course facilitator (lecturer) to continually encourage and challenge coaches as to their perceptions of their own practice in a supportive and inclusive manner. Although scholars (e.g., Mallett, in press) have acknowledged the challenges in developing a fully functioning *coaches' community of practice* (CCoP; Galipeau & Trudel, 2006), courses within the sports coaching programs have actively sought to provide opportunities for coaches to develop their social networks.

The approach to curriculum design and assessment for *Pedagogies for Coaches* is consistent with developing this sense of community using an authentic learning approach. In this course coaches are asked to reflect on their own practice through discussion board postings. Appropriately structured online discussions can foster self-evaluation and reflective practice as well as introduce fellow coaches to a variety of other coaches' work and views. Discussion board postings can also provide students with opportunities to reflect on their own perceptions upon which coaches as learners construct their own understandings by making sense of information and building personal meaning (Mallett, in press). In developing a sense of community in an online environment learners have reported a higher sense of course satisfaction (Tinto, 1998).

The authenticity of learning is also reflected in the design of meaningful and relevant assessment tasks. As an example, *"the assessment items were great; relevant and well thought out. The focus was on synthesising and integrating ideas and information from the literature INTO your coaching rather than the literature itself. Each task led the student into the further complexities of athlete development and planning producing the template and annual plan for the last few was very useful indeed ... I have added to my skills set and have some fantastic new tools to implement and refine in my coaching"* (student feedback - *Training Programs for Elite Athletes* - 2005).

The online learning environment offers coaches the flexibility of studying at times convenient to student-coaches within a busy schedule of work, coaching, and family. Moreover, the integration of study with coaching practice promotes effective use of time and energy. In authentic formal coach education, coaches' learning is mediated (Moon, 2004) or guided (Billett, 2006) by some competent other (Mallett, et al., in press) consistent with Vygotsky's (1986) co-construction of knowledge. The nature of the online course is such that it can offer formal study opportunities to coaches based anywhere in the world. The majority of coaches who are

enrolled are from Australia; however many coaches (some expatriate) come from United Kingdom, USA, Canada, New Zealand, Italy, Germany, Japan, Belgium, Singapore, Phillipines, Serbia, India, Malaysia, and Fiji. Communication online is mostly asynchronous and therefore learning through the e-learning platform is independent of time zone differences.

The exponential growth in the number of online learning courses offered by tertiary institutions, corporations and governments, supports the notion that this alternative learning medium has something meaningful to offer. Aspects of flexible learning within this program are continually evolving to better meet the needs of coaches as learners as well as implementing an ever-changing array of instructional devices offered through technological delivery (i.e., Web 2.0 technologies). The courses are continually evolving, especially their delivery and attempts to engage student-coaches, as data from both internal (e.g., student feedback) and external reviews are synthesised and evaluated and where appropriate actioned.

Support for Learning

It cannot be assumed that students enrolled in the online program in sports coaching come fully equipped with the necessary information technology skills or academic skills required to navigate an online postgraduate course. Prerequisite skills in word processing, data analysis, research skills and academic writing are essential 21st century education skills. Students enrolled in the program have online access to UQ library resources. The University of Queensland has one of the largest collections amongst academic libraries in Australia. Inherent in course design is the opportunity for students to gain online skills through training programs offered at UQ library (Cybrary). This extension of learning outside the confines of the content of courses is another element toward becoming a life-long learner.

Skill induction training for online lecturers (facilitators) is also at the forefront of strategies embedded in the program. A strong design framework allows for in-servicing faculty currently teaching in the program and assists in the development of strategies for best practice in teaching in an online environment.

Evaluation of UQ/ASC Postgraduate Sports Programs

We preface this section by reporting that all formal education programs are continually undergoing evaluation and re-development as a consequence of feedback from students, faculty, and external reviewers. Our programs have undergone significant transformation from their inception to today. Certainly, there have been major shifts in the delivery through advances in computer software improving communication between students and faculty, but there have also

been significant improvements in the design of meaningful assessment tasks. Favorable reports have acknowledged the authentic nature of the programs and their contribution to coach development. For example, we were pleased to hear from the Director of the Coaching and Officiating Unit at the ASC that their survey showed that, *"Nearly half the students in the AIS scholarship program reported that their studies at UQ were the best part of their AIS scholarship"*. It is noteworthy that a large part of the scholarship is working under the mentorship of a national coach and with a national level program. That finding was surprising considering research has shown only limited utility of formal coach education programs and the strong view that mentoring is the solution for the perceived failure of coach accreditation/education through large-scale programs (e.g., Cushion et al., 2003; Dickson, 2001; Lyle, 2002; Mallett, et al., in press).

In 2004, three independent external parties reviewed the postgraduate programs in sports coaching at UQ. The three reviews were aimed at: (a) examining the online delivery of the courses (dK2 Report, 2004); (b) the relevance and integrity of the tertiary courses and programs (Sanderson, 2004); and (c) the potential of the programs to articulate with the National Coach Accreditation Scheme (NCAS) (Pearce, 2004).

In the early stages of development it was considered critical to ensure the suitability and complementarity of the course content. Furthermore, the aim of developing critical thinking and creative coaches was paramount in the development of the courses. The importance of coaches developing critical thinking skills has been argued elsewhere (e.g., Lyle, 2002) and formal tertiary coach education can provide a suitable forum for developing those skills through mediated learning (Moon, 2004). The suite of postgraduate programs in performance sports coaching has been recognized by the international community as *"an important innovation with significant implications to coach education programs throughout the world"* (Sanderson, 2004, p. 10). Moreover, *"the web analysis identified the academic rigour of the online courses is the same as for face-to-face courses"* (dK2, p. 36) and that, *"in broad terms the analysis of the effectiveness of the online presentation and delivery of the postgraduate programs revealed a high level of student satisfaction"* (p. 10).

Future Directions

Authentic tertiary-based sports coaching programs that meaningfully connect with coaches' work can positively contribute to coach development. Moreover, tertiary-based education programs can articulate with national coach accreditation programs/awards. There is interest in this articulation from some sports, and we believe only a matter of time before tertiary-based coach

education programs will complement field experiences in coaching and subsequently contribute to coach accreditation; the challenge is how to integrate formal and informal learning experiences for the purposes of coach accreditation (Mallett, et al., in press). Certainly, our experience is that coaches have benefited from formal tertiary-based coach education; and in particular the reported increase in coaching self-efficacy.

A significant benefit of the large number of graduates in our postgraduate programs in sports coaching has been the significant interest in research in coaching. This increased interest has led many graduates to enrol in research higher degrees examining coaching and the coaching process, which we believe will contribute to the professionalization of coaching (Lyle, 2002).

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Korea Coaching Development Center(KCDC)

The Coaching Development Center (CDC) was established by Dr. Jeong-Keun Park (founder/co-president) and Dr. Ik Soo Moon (co-president) in November, 1998. On January 2002 the official name was changed to the Korea Coaching Development Center (KCDC). The mission of the KCDC as a non-profit organization is to improve the quality of elite, youth, and elder-sports coaching in Korea.

- The KCDC publishes a quarterly newsletter, academic journal, and books that relate to coaching. The KCDC also publishes a bi-annual international journal named the International Journal of Coaching Science (IJCS) in cooperation with the International Council for Coach Education (ICCE).
- The KCDC holds seminars and workshops and contributes articles in the newsletter of the Korea Professional Golf Association (KPGA) and Korea Football Association (KFA).
- The KCDC presents successful Coach Awards.
- The KCDC uses the internet website (www.ikcdc.net) for the exchange of information between members.
- The KCDC is supported by several university professors, coaches, and other members of the sporting community.
- The KCDC is financially supported by its membership fees, donations, and some business programs.



The International Council for Coach Education About the ICCE

The International Council for Coach Education (ICCE) is a not-for-profit, international organization with the mission of promoting coaching as an internationally accepted profession. ICCE members seek to enhance the quality of coaching at every level of sport.

Every day around the world, tens of millions of athletes run, jump, throw, catch, swim and participate in other sport activities. And every day around the world, millions of coaches help those athletes chase their dreams. The ICCE believes that international collaboration and exchange can accelerate positive change in the realm of coaching development and help these coaches give athletes around the world a chance to pursue excellence.

By joining together in the ICCE, members seek to develop an international framework to share this vision with every nation in the world's sporting community.

The target audiences for the ICCE are National Representative Bodies responsible for coach education; institutions that deliver coach education; individuals who design and deliver coach education; coaches; and the international sport community at large.

The expected outcomes of the ICCE initiative are: A network of international organizations responsible for the development of coaches in their respective nations. International accords on coaching issues such as ethics, safety, and knowledge/competency. An international coaching culture that supports the values of Olympism: integrity, honesty, fairness, inclusion, tolerance, and commitment to excellence. The ICCE is uniquely qualified to address its mission because its members comprise the world's leaders in coaching development. There exists no other international sports body that focuses on programs for the individuals who introduce, teach, and deliver sport daily-coaches.

Organizational Structure

The ICCE organizational structure includes a General Assembly, Board of Directors, Finance Committee, Ethics and Disciplinary Committee, and Control Committee.

The General Assembly

The General Assembly brings together all ICCE members every second year. The membership structure includes four categories of members:

Category A – National Representative Bodies

Category B – Organizations

Category C – Individuals

Category D – Honorary members

Board of Directors

The Board of Directors consists of eleven members, elected by the General Assembly to a four year term of office, to include:

A President;

A General Secretary;

A Treasurer;

Five members representing the five continents: Vice President for Africa, Vice President for the Americas, Vice-President for Asia, Vice President for Australia/Oceania and Vice President for Europe.

Four additional members

The Board is responsible for establishing the programs, policies, and procedures of the ICCE.

Control Committee

The Control Committee consists of two members, elected by the General Assembly to a four year term in office. The Control Committee shall review the ICCE's monetary affairs and other actions, and report any errors or omissions to the General Assembly.

The International Council for Coach Education

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