



DEVELOPMENT AND EVALUATION OF AN OPEN ONLINE COURSE IN  
SPORT PSYCHOLOGY USING SELF-DETERMINATION THEORY  
PRINCIPLES

A Thesis submitted by

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### Abstract

The provision of free, open, and online content is a relatively new phenomenon through which education providers are exploring innovative new business models to bring their content to a global audience. Learning materials that are openly licensed and readily accessible have the potential to transform educational delivery and present learning and psychological growth opportunities for all. However, there is little consensus as to how best design and deliver open online courses, where barriers to access are low and dropout rates are high. With its strong focus on autonomy and high quality motivation, self-determination theory (Deci & Ryan, 2000) provides an ideal frame of reference to approach the design and development of open online courses. The present research describes the design and evaluation of an open online course titled *Elite Sport Performance: Psychological Perspectives*, being the first of its type in the world. Three related studies were conducted, each building on the next: Study 1 provides an evaluation of a first iteration of the course run in 2013, which was deemed unsuccessful. The course was evaluated mainly using web analytic criteria and provided useful insights to support a completely new iteration of the course. Study 2 articulates a redesign of *Elite Sport Performance: Psychological Perspectives* that addressed supporting the three basic psychological needs of self-determination theory: autonomy, competence and relatedness, with a view to fostering intrinsic motivation to engage learners and optimise learning outcomes. A step-by-step approach using best practice techniques is provided. Study 3 presents an empirical evaluation of *Elite Sport Performance: Psychological Perspectives* that was released to a global audience in late 2015 with 1007 registrations from 73 countries. The final study includes engagement data derived from web analytics, self-determination theory metrics (e.g., satisfaction of basic psychological needs),

and qualitative feedback from participants. Additionally, data are presented around continuance intention and reasons for non-engagement to better contextualise motivational dynamics in an open online course environment. In general terms, when taken together, the second iteration of the course was successful and supported the design approach taken. The implications of the findings of the present research suggest that designing for open online courses is a unique context in which the needs of the learner need to be carefully considered. A set of recommendations to enhance the design of open online courses such as *Elite Sport Performance: Psychological Perspectives* are provided. Suggestions for further research, particularly surrounding the potential benefits to well-being and eudaimonic flourishing offered by open online courses are speculated.

*Keywords:* Open education, self-determination theory, user-centred design, basic psychological needs, sport psychology

**Certification of Thesis**

This thesis is entirely the work of Neil Ian Martin except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Student and supervisors signatures of endorsement are held at USQ.

Neil Ian Martin

29/11/2016

**ENDORSEMENT**

Prof. Peter C. Terry (Principal Supervisor)

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**List of Conference Presentations**

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Terry, P.C., Martin, N.I., & Guinto-Adviento, M.L. (September, 2016). *Case report of an Open Educational Resource (OER) initiative for developing countries*. Presentation at the 3rd International Convention on Science, Education and Medicine in Sport, Sao Paulo, Brazil.

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## Chapter 1 – Introduction

In the second decade of the 21<sup>st</sup> century, digital technology plays a fundamental role in how humans live, learn, work, and seek entertainment. Many higher educational institutions around the world have endeavoured to take advantage of the affordances of the Internet and associated access technologies for corporate activities including recruitment, outreach communication, research, and facilitating student learning. Alternative and innovative new models of educational delivery have emerged, including fully accredited online courses, open educational content free for download, and Massive Open Online Courses (MOOCs). Meanwhile, the educational needs of society are changing, with most developed economies moving away from reliance on manufacturing and towards industries that require specialised knowledge and skills. Furthermore, the future points towards sophisticated technology replacing many traditional jobs, which will be automated through artificial intelligence and robotics. A highly cited report by Frey and Osbourne (2013) from the University of Oxford claims that around 47% of current jobs in the US labour market are at risk to automation. Many in society will need to upskill, retrain or specialise, in order to thrive in the emerging global economy.

A recent Pew Research Center survey of 2,752 American adults (Horriagan, 2016) examined attitudes to learning and found that 73% of respondents consider themselves as lifelong learners, 74% had undertaken personal learning activities, and 36% had taken a class or received training the past 12 months. Assuming that these figures can be generalised more widely, it is reasonable to suggest that there is public demand for learning content, both formal and non-formal. Open courses offered over the Internet provide opportunities for learning that do not necessarily involve gaining an accredited qualification yet potentially allow learners to explore a new subject,

gain new skills for this new world of work, or simply build confidence with a view to entering formal education in the future.

The research presented in this thesis constitutes an investigation into the redesign and evaluation of an open online course titled *Elite Sport Performance: Psychological Perspectives*. It builds upon an earlier open initiative by the University of Southern Queensland (USQ), the Open Educational Resources *universitas* (OERu), and the Asian-South Pacific Association of Sport Psychology (ASPASP) in which a first iteration of the course was produced. The open course, which ran in late 2013, was developed to widen access and understanding of professional approaches to the psychology of elite sport performance. However, it was acknowledged as unsuccessful in terms of sustained participant engagement and it was proposed that a new approach to design should be taken and evaluated empirically. This chapter will briefly provide further background and rationale for the research, present broad research aims and objectives, and summarise the structure of the thesis.

### **Research Rationale and Aims**

In the traditional experience of adult learning such as enrolling on a degree course, the learner invests both time and money in the belief that gaining a qualification will be beneficial in terms of, for example, becoming more employable or to update skills. However, even if the course is poorly designed, the learner may not feel they have any choice but to continue, having spent a large amount of money or worked hard to get accepted onto the course. Evidently, traditional education contains many contingencies to which a learner must respond and which may impact on motivation or alternatively create psychological pressures with potentially deleterious consequences.

In the last fifteen years, new educational models have emerged that are based upon open principles and take advantage of the network connectivity of the Internet. In general terms, open educational initiatives are founded upon a basis of access for all; that is, education that is not for an elite group but for everyone, irrespective of educational achievement. In addition, educational content may be produced as openly licenced materials, meaning that others may download and use, reuse, or repurpose content as Open Educational Resources (OERs). There have been many open access initiatives but those of note include: MIT OpenCourseWare, the OERu Foundation, and the first MOOCs developed by George Siemens and Stephen Downes. Most recently, MOOCs have extended their cultural impact, with universities around the world partnering with Silicon Valley start-ups such as Udacity, Coursera, and EdX to provide free courses on a wealth of subjects and to thousands of people.

The experience of participating as a learner in an open online educational context is very different to traditional education. In general terms, barriers to access are low and financial costs to the learner are minimal, but drop-out rates are generally very high, with completion rates of around 10% on average (Jordan, 2015). MOOCs have received a large degree of criticism for high drop-out rates in spite of their very different context to formal education provision. In part this is due to the media hype surrounding the launch of the first commercial MOOCs in 2012 to which untenable claims were made about their impact (Kovanović, Joksimović, Gašević, Siemens, & Hatala, 2015). In an increasingly digitised world, perhaps this is unsurprising, given that technology provides a plethora of experiences, and if the current experience is not satisfactory then user will most likely drop out or gravitate to another online activity (Krishnan & Sitaramen, 2013). The present research



proposes that motivation is easily undermined in open online courses such as MOOCs and therefore optimising the design to stimulate motivation and engagement is an imperative.

The word motivation is derived from the Latin word *movere*, meaning to move or to stir. Behaviourists such as Hull (1943) and Skinner (1948) demonstrated that organisms can be motivated through schedules of contingent reinforcements and will learn new things under controlled conditions. Furthermore, through such environmental controls, an organism can be motivated towards specific targeted and complex behaviours. However as later theorists have argued, behaviourism does not acknowledge cognitive processes (e.g., Bandura, 1977), whereas others suggest that the experiential and affective correlates of motivational functioning are also important in terms of quality of behaviour (see Vansteenkiste & Mouratadis, 2016 for an overview).

The dynamics of motivation and engagement in educational contexts is an area of great interest to many scholars. It is axiomatic to reason that in order to learn one must feel motivated to learn, yet creating the conditions in which learners are intrinsically motivated to direct their own learning is challenging. In online education where many of the traditional social cues and tools to support learning are not present, the challenge is even greater. Meanwhile, in non-formal learning contexts such as open education, the driver of obtaining a recognised qualification whilst making significant personal financial and time commitments is not evident.

The motivational theory most relevant to the present research is self-determination theory (Deci & Ryan, 2000). Self-determination theory is a broad theory of human motivation, integration, and behaviour that places great emphasis on the quality of motivation that individuals may possess. The theory provides an

applied framework to the design of environments in which individuals may act with volition and self-endorsement, with a sense of self-efficacy, and flourish and grow. The theory is synergistic with the context of open online courses where registrants are placed in a very different scenario to formal education. More specifically, they must endorse their own engagement and activity within the course as well as self-regulate their own learning. Self-determination theory will inform much of the present research and will be described in depth in the literature review in Chapter 2.

The research philosophy adopted in this thesis draws upon empirical approaches articulated in modern psychological science. Hypotheses are stated where necessary and data collected using valid and well-established measurement tools including psychometric tests and web analytics. From analysed results, any stated hypotheses are tested, and conclusions induced in the tradition of Aristotle and Bacon. As a guiding theoretical perspective, self-determination theory (with its focus on human autonomy) blends a number of philosophical influences including phenomenology and existentialism, whilst utilising practical scientific and analytical methods common to modern psychology (see Ryan & Deci, 2017).

The present research has two broad aims. The first aim is to identify the key design features necessary to optimise engagement and subsequent persistence of course participants in an open online course about the psychology of elite sport performance. More specifically, the present research will examine the design qualities that will most likely energise motivation to increase engagement in a learning environment that is still relatively novel in terms of understanding and very different in context. The second aim is to describe the activity and engagement that takes place within an open online course environment predominantly using self-determination theory as a lens of enquiry. In addition to understanding engagement,

a further objective is to shed light on why individuals do not participate or drop out early in a course so has to help further contextualise engagement dynamics. Figure 1.1 provides an overview of three studies that were conducted and will be described in this thesis.

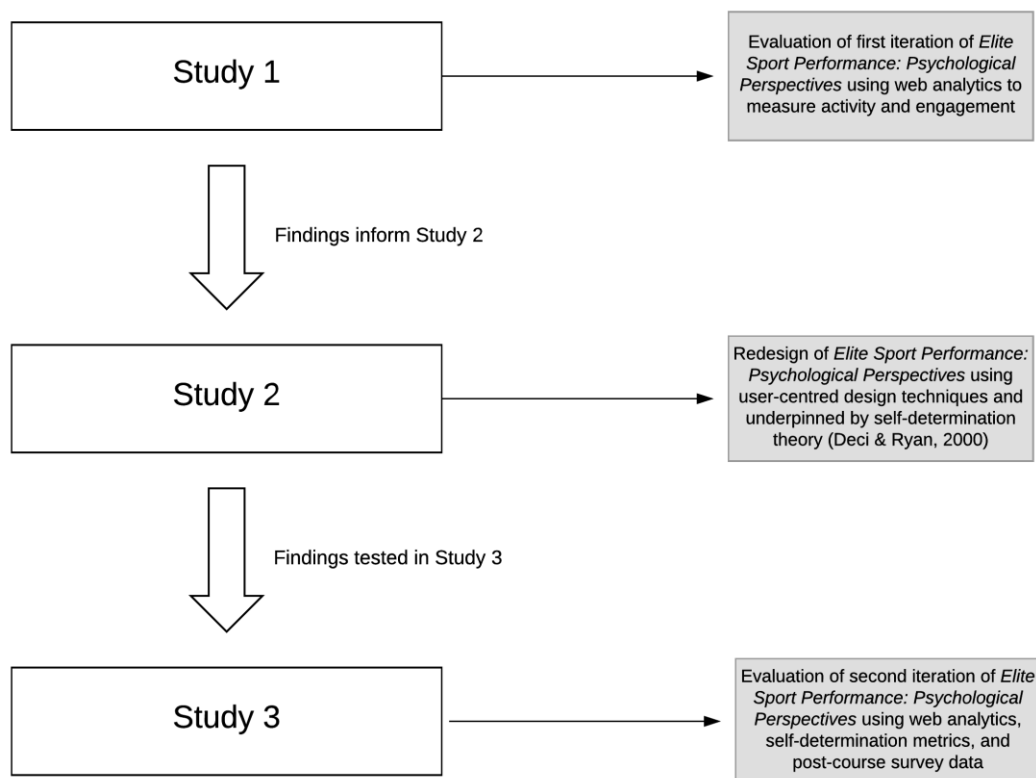


Figure 1.1. Overview of studies conducted in the present research.

### Structure of Thesis

Following the current chapter, Chapter 2 presents a literature review outlining the context and practice of open education, including its evolution as an alternative form of education, open content as OERs, and the emergence of open online courses with particular reference to MOOCs. The literature review will also provide some background on the status of sport psychology education within open online contexts. Furthermore, narrative will be provided on user-centred design approaches, which will form the practical techniques for designing a new iteration of

*Elite Sport Performance: Psychological Perspectives*. The literature review will proceed to give an in-depth account of self-determination theory, which forms the theoretical backbone of this thesis. Finally, the literature review will conclude with a specific set of research questions that will frame the three studies to follow.

Chapter 3 provides a critical review of the first iteration of *Elite Sport Performance: Psychological Perspectives* through analysis of open web analytic data that was provided by the OERu and constitutes Study 1 of the present research. The researcher was not a member of the original course development team and was invited to redevelop the course. The consensus of the course development team was that the implementation had underperformed in terms of engagement. Web analytic data were examined to develop insights into the design qualities that underpinned the original course and to then use this information to inform a brand new design. The chapter will provide details of the methodological approach taken, present the data with corresponding narrative, and interpret the information to help frame the new course.

Chapter 4 provides a rigorous step-by-step description of the course development from first principles to final production and constitutes Study 2. It will first describe how self-determination theory was applied to create a design framework. Second, it will report in detail the process of design, which will include best practice techniques of user-centred design. It will broadly detail three phases of an iterative design process: pre-production, production, and post-production. In each of these phases individual steps taken in the design process will be outlined. The chapter will emphasise the importance of high quality production values and attention to detail to the learner experience with the view to creating a course that will optimise motivation and subsequent engagement in an open online context.

Chapter 5 reports on an empirical investigation into motivational and engagement phenomena associated with those participating in the redesigned second iteration of *Elite Sport Performance: Psychological Perspectives* that ran in late 2015 and early 2016 and represents Study 3. It examines the same activity and engagement metrics used in the first iteration of the course to act as a point of comparison and shed light on participant behaviour. The chapter also examines engagement in consideration of robust psychometric measures derived from self-determination theory research. Finally, the chapter will conclude with quantitative and qualitative data to explore the experience of taking part in the course as well as understanding the reasons for dropping out.

The thesis concludes with Chapter 6, which provides a general discussion that summarises and contextualises the findings. It includes a set of recommendations regarding the key design features required to develop a successful open online course. It will elaborate on how the research has contributed to new knowledge, consider limitations of the research, and end with recommendations for future research directions.

## Chapter 2 – Literature Review

The provision of free, open, and online educational content is a relatively new phenomenon that is enabling education providers to explore new business models and practices and bring their output to a global audience. Content that is openly licensed and readily accessible has the potential to transform educational delivery models (Brown & Adler, 2008), a fact that has received recognition at the highest level of government. In the period 2011-2016 for example, the Obama administration invested over \$2 billion in open education, most notably within the American school system through the #GoOpen campaign (Office of Educational Technology, 2016). Meanwhile, universities around the world have devoted assets towards open education and its research, with advantages perceived in terms of reputational benefit, outreach, and widening access (Kassabian, 2014).

From a learner perspective, open education offers alternative opportunities to learn and gain qualifications or course credit in non-traditional ways. It holds special importance in relation to individuals whose access to modern educational content is restricted or who cannot afford the increasing cost of formal education. Furthermore, low barriers to access to a range of courses allow potential learners to informally explore and expand their knowledge or even “try a course before buying” when considering whether to pay for a training course or a higher education degree. Additionally, it can be reasonably proposed that engaging with open education positively contributes to the *eudaimonic* well-being of the learner (Michalos, 2008), through new understanding and knowledge attainment.

Open online courses, like most successful online products or services, rely upon good quality design. The fact that the course is open to all means that learners can choose to engage or not, with very few controls in place when compared to

traditional education e.g., course fees, high-stakes qualifications, and peer relationships. Aggregated data from open courses, particularly MOOCs, illustrates a general trend of high dropout rates when compared to traditional courses (see Jordan, 2015). Although high dropout rates are not unexpected given the context, questions around design as well as innovative applications of motivational theory require exploration to identify avenues of improvement. This chapter reviews the literature addressing research into open education, user-centred design, and self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000).

### **Open Education and Open Courses**

Finding historical consensus on the definition of open education is problematic, although a longstanding narrative exists around access to education and to learning materials. Open education as a construct predates the open source software revolution of the 1990s, from which modern understandings of openness derive. Notionally, its philosophical roots lie at least as far back as the age of enlightenment ([ca. 1650-1800] Peters, 2010), when attitudes to education being solely for the elite of society were challenged by a number of thinkers including Rousseau (1712-1788), Paine (1737-1809), and Bentham (1748-1832). Later, Dewey (1859-1952) asserted that access to education was a democratic right, arguing that “Obviously a society to which stratification into separate classes would be fatal, must see to it that intellectual opportunities are accessible to all on equable and easy terms” (1930, p.101). In the 1960s and 1970s, models of open education were proposed that focused on secondary school teaching pedagogies as an alternative to traditional methods (Friedlander, 1975; Walberg & Thomas, 1972), and on access to tertiary education at distance for those without formal qualifications through new

learning institutions such as the UK's Open University (Peter & Deimann, 2013) and Canada's Athabasca University.

Philosopher Ivan Illich (1926-2002) offered specific critiques of modern educational institutions through his influential treatise *Deschooling Society* (1971). He provocatively argued that schools and universities failed learners with too narrow foci on social acquiescence, individual evaluation, and obtaining qualifications at the expense of true learning. Illich believed in the power of informal and incidental education (p. 22) and proposed decentralised forms of learning or "learning webs". Illich alluded to educational approaches that many would now recognise as open, stating that an educational system should:

provide all who want to learn with access to available resources at any time in their lives; empower all who want to share what they know to find those who want to learn it from them; and, finally furnish all who want to present an issue to the public with the opportunity to make their challenge known. (p. 75)

Although many of these radical ideas have not been realised in the true sense that Illich had intended (Daniel, 2013), his assertion on there being alternative ways of learning has permeated into open practice (e.g., Sharples, Kloos, Dimitriadis, Garletti, & Specht, 2015; Wheeler, Yeomans, & Wheeler, 2008) where the "power of the network" in the equitable and decentralised form of the Internet, can act as a platform for both formal and informal learning.

Open education can also be placed in the wider context of openness as part of a modern technological, political, and philosophical movement. Example areas include open source software development, open data, open publishing, open research, open democracy, and open science. In each of these cases, the role of the



Internet as an open platform for sharing knowledge is central, and similarly the conceptual framework of open education is characterised by educational delivery models that leverage the Internet to deliver and share openly licensed educational material in the form of Open Educational Resources (Brown & Adler, 2008; What is OER?, 2016).

Open Knowledge International, a global not-for-profit organisation, has made a valuable contribution to the understanding of openness. The organisation has a mission of advocacy that will allow open sharing of knowledge to become a mainstream concept within institutions and society. More specifically, they argue that openness will concomitantly make a positive contribution to all lives as well as make institutions more transparent and accountable. They have developed an *Open Definition* (Open Definition 2.1, n.d.) with the purpose of providing unambiguous descriptions of the legal and technical qualities of open content. They refer to this content as an *open work*, being an “item or piece of knowledge being transferred” (para. 3). Noting that the Open Definition is quite detailed, three key qualities are briefly highlighted below:

1. Open works *must* be in the public domain or provided under an open licence. Furthermore, modified versions may require having a different title or version number with information about any changes included. Open works should be accessible by being downloadable from the Internet without charge. The work should be machine-readable so that a computer can process it and it must also be in open formats that make use of open technical standards e.g., HTML.
2. The licence attached to the open work must allow free use, redistribution, modification, and separation or compilation, also known as “remixing” (Wiley, Bliss, & McEwen, 2014), as specified by the creator.

3. Open works may require attribution if redistributed, repurposed, etc. and may require to be distributed under the same licence conditions.

**Open Educational Resources.** The Open Definition provides a framework for the creation, licencing, and distribution of open works including OERs. Creative Commons, another non-profit organisation, has created a licencing system for sharing OERs based on specifications laid out in the Open Definition. Creative Commons define OERs as “teaching, learning, and research materials in any medium that reside in the public domain or have been released under an open license that permits their free use and re-purposing by others” (Creative Commons Education, n.d., para. 2). A useful working definition is also provided by Grodecka and Śliwowsk (2014), via the Creative Commons-sponsored Open Education Resources in Europe Project, who describe OERs as,

any educational resources (including curriculum maps, course materials, textbooks, videos, multimedia applications, podcasts, or any other materials designed for teaching and learning) which have been made available for use under open licenses – which means that anyone can use, adapt and redistribute them. Those materials may be available online, in print, on DVD or any other carrier. (p. 8)

An important commonality of all educational content packaged up as OERs is that they are freely available for use, reuse, sharing, repurposing, and adaption depending upon the licence chosen by the creator. Licensing is generally achieved through the Creative Commons licensing system in which owners of the intellectual property attach a licence to freely share their material with others under a range of specifications that expand or limit how that content can be used. This concept specified as *some rights reserved*, acts as an alternative to traditional copyright

licensing where the copyright holder tightly controls use of intellectual property. Equally, it acts as an alternative to *fair use* of copyrighted materials, which is limited to only a few countries (such as the United States) and is imprecise in legal definition and scope. Particular to all Creative Commons licenses is the requirement that usage of content is attributed to the owner of that content and an optional condition expressed by the licence holder that any adaption of that content is *shared-alike* (i.e. shared under exactly the same licence). Therefore, a content producer can choose a specific Creative Commons licence, set the degree to which it can be reused or remixed, and request that the content is attributed accordingly.

***OER discoverability and access.*** Creative Commons-licensed content, including OERs, can be accessed in a myriad of ways. Major search engines, including Google and Microsoft Bing, have filters that allow Creative Commons licensed images to be uniquely searched. Searches using these filters return images from a range of sources such as Wikipedia, Wikimedia Commons, Flickr, and Pixabay. Alternatively, a range of commercial media sharing websites including YouTube and Vimeo (videos), SoundCloud (audio and music), and Flickr (images) have their own internal searches to find open-licensed media. Meanwhile, Creative Commons Search is a meta-search tool developed by Creative Commons, which allows users to identify a specific content source and search on that collection alone e.g., select open-licensed videos on YouTube alone.

Open-licensed content downloaded from the example sources above may be reused, remixed, and repurposed as OERs for educational practice as specified by the licence (Friesen, 2013). Open learning practitioners can create, upload, and share their educational content into dedicated OER repositories, such as OER Commons, Jorum, and Merlot. OERs can also be discovered through specific institutional

repositories belonging to universities and libraries; prominent examples include MIT Open CourseWare, the British Library manuscript collection, and OpenLearn from the UK's Open University.

It can be argued that although there are large quantities of OERs to discover, the process of accessing them through different search facilities and repositories is both complex and heterogeneous. A survey of 99 social scientists by Brent, Gibbs, and Gruszczynska (2012) found that many participants had limited knowledge of different types of discovery tools and also expressed concern about the quality of resources returned in searches. Although OER discovery remains problematic, projects continue to attempt to improve the situation and a recent initiative is the Amazon Inspire program. Over the past 20 years, Amazon as an online retailer has developed an extensive technical infrastructure for the storage and discoverability of content. This infrastructure is being harnessed to host OERs and to improve discoverability through coupling the Amazon search engine with metadata standards (see "Metadata Basics", 2016) developed by the US government (Lunden, 2016).

**Criticisms of OERs.** Despite a proliferation of openly licenced content online, the mainstreaming of open educational resources into educational practice has seemingly not occurred (Falconer, McGill, Littlejohn, Boursinou, & Punie, 2013). Specifically, OERs have not yet in any substantive way changed either educational practice or sustainable access to education, although there have been many pockets of excellence throughout the world (e.g., MIT Open CourseWare, OpenLearn, OERu, etc.). A number of problems surrounding OERs have been identified by expert commentators, which include: a) issues of discoverability and access (Falconer et. al, 2013); b) misunderstanding of the nature and purpose of OERs (Anderson, 2013); c) a lack of institutional strategic direction (Chen,

Nasongkhla, & Donaldson, 2015); d) OERs defined narrowly as consumable education content as opposed to something that can be appropriated and remixed (Moe, 2015); e) issues of quality and sustainability (Wiley, 2007); and f) an almost utopian view of the game changing nature of OERs (Gourlay, 2015). Although these issues should not be underestimated, a helpful perspective is offered by world leading OER expert David Wiley who ascribes to the notion of “pragmatism over zeal” (2016, para.1). In other words, OERs have inherent affordances and utility, which in the context of the present research allows for the use of and development of OERs to create an open online course about the psychology of elite sport.

**MOOCs.** MOOCs or Massive Open Online Courses are a relatively new phenomenon in education that have garnered a great deal of interest and media hype (Yuan & Powell, 2013). MOOCs are short online courses that are generally free and delivered at a large scale to thousands of learners online through either: a) partnerships between universities and commercial or non-profit MOOC providers, or b) independent MOOCs on open source platforms. The concept of the MOOC has been credited to the 2008 work of George Siemens and Stephen Downes (Alexander, 2008; Cormier, 2008) who created the very first MOOC titled *Connectivism and Connective Knowledge*. This MOOC was developed with a different pedagogical model to many modern MOOCs, but was the first open online course to be run at scale with over 2,000 registrations. In the period since, many universities around the world have experimented with MOOC provision, often partnering with service providers including Coursera, Udacity, FutureLearn, and EdX.

Many MOOCs have high rates of enrolment, although obtaining accurate and verifiable figures on participation and engagement can be difficult (see Jordan, 2015). Presently, the UK’s FutureLearn claims to have hosted the world’s largest

MOOC in 2015 with approximately 370,000 learners enrolling for a course titled *Understanding IELTS: Techniques for English Language Tests* (Coughlan, 2015). Following initial media hype around MOOCs in 2012 (Pappano, 2012), the number of courses available has increased considerably over time, with thousands of courses now accessible. In addition, some MOOC providers are now exploring models in which they charge for course accreditation or certification often in partnership with a university or business corporation.

MOOCs are relatively informal when compared to traditional education and are often marketed towards a diverse international cohort of learners (de Freitas, Morgan, & Gibson, 2015). They are related to but separate from OERs in that they are fully-fledged courses that are intended to be accessible to all, but use new business models and distribution platforms. MOOCs have generated a great deal of debate amongst scholars, particularly around educational impact and disruption (Conole, 2016), educational design (Margaryan, Bianco, & Littlejohn, 2015), quality (Downes, 2013), sustainability (Dabbagh et al., 2016), and authentic openness (Bates, 2012).

***Evaluating MOOCs.*** MOOCs have had mixed success, with the biggest problems identified being high dropout rates, issues of quality and certification, opaque business models, and limited design (Daniel, 2012; Sharrock 2015). MOOCs on average have completion rates of 12% (Jordan, 2015), but quality metrics for MOOCs remain a matter of debate, particularly in light of the very different context of MOOCs from traditional education. Reflecting on leading a MOOC on medicinal chemistry, Stevens (2014) argued that completion rates for open courses should not be the only indicator of success, as they do not give the full picture in terms of engagement. Stevens proposes that other measures including learner expectations

and web analytic data (describing content engagement and user activity) should also be taken into account if cross-comparative evaluation of MOOCs is to have any meaning. Furthermore, other MOOC specialists argue that each MOOC can only be judged on its own merits (Downes, 2013), specifically that a course should be evaluated against the design objectives set out for the course as opposed to evaluation at a macro level. A salient observation is made by founder of the Online Course Report website Merrill Cook (n.d.) who suggests that the quality of a MOOC lies in the benefits perceived by the learner:

Viewing MOOCs like books—as optional reading materials for self-empowerment instead of substitutes for an increasingly mandatory college degree—places the burden of educational responsibility on learners themselves. This built-in emphasis on self-motivation means that the success of massive open online courses is more accurately measured by whether or not a course empowers learners to reach the goals they desire. In other words, a MOOC should be considered successful only insofar as a learner gets what they want from it, whether that be a new job, a new skill, or a just better grasp of how to learn. (para. 17)

Irrespective of the debate around MOOC quality and impact, it is safe to argue that MOOCs represent a potential paradigm shift in terms of educational delivery. George Siemens (2015), as creator of the world's first MOOC and a leading expert on open online education, stresses that MOOCs are unlikely to ever fulfil the initial hype around them, but nevertheless exist both as a product of the increasing digitisation of education and the complex needs of society (p. xiv).

**Andragogy.** Although not confined to adult education, OERs and MOOCs may be placed in the context of adult learning approaches. Although there are many

examples of OERs being utilised by teachers in school settings (e.g., de Los Arcos, Farrow, Pitt, Weller, & McAndrew, 2016), the vast majority of open practice has tended to be in adult education. It could be argued therefore, that principles of andragogy are relevant to the provision of OER and MOOCs. *Andragogy* (Knowles, 1980; Merriam, 2001) describes approaches to adult self-directed learning and contrasts with notions of *pedagogy*, which although widely used to encompass all forms of learning at all ages, is mainly relevant to teacher directed learning to children.

Knowles (1980, 1984) offered five assumptions about the qualities of adult learning that are different from child education. As summarised by Merriam (2001, p.5), it was suggested that an adult learner: a) has an independent self-concept and can direct his or her own learning; b) has accumulated a reservoir of life experiences that is a rich resource for learning; c) has learning needs closely related to changing social roles; d) is problem-centred and interested in immediate application of knowledge; and e) is motivated to learn by internal rather than external factors.

Andragogy is not without controversy as a concept, being heavily critiqued by some education scholars (e.g., Darbyshire, 1993; Norman, 1999; Rachal 2002). Meanwhile others have proposed a new term *heutagogy* (see Blaschke, 2012), which is described as self-determined learning and shares some commonality with self-efficacy theory (Bandura, 1995). Nevertheless, andragogy introduces some practical principles of self-directed learning that are relevant to the present research because it shares some philosophical underpinnings with self-determination theory in its focus on autonomous learning and self-integration. Perhaps where self-determination theory would differ is that the five assumptions posited above are not a given. They would only be present if specific psychological supports are in place in the adult



learning environment. Self-determination theory will be examined in more depth later in this chapter.

***Traditional and informal learning.*** Relevant to principles of adult education are various types of learning. More specifically, learning can be recognised as being formal, non-formal, informal, situational, lifelong, etc. The Organisation for Economic Co-operation and Development (OECD) for example, describes formal learning as “always organised and structured, and has learning objectives. From the learner’s standpoint, it is always intentional: i.e., the learner’s explicit objective is to gain knowledge, skills and/or competences” (Werquin, 2010, p. 21). Meanwhile the OECD definition of informal learning is “results from daily activities related to work, family or leisure. It is not organised or structured in terms of objectives, time or learning support. It is in most cases unintentional from the learner’s perspective” (p. 22). Finally, the OECD describes non-formal learning as “learning which is embedded in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support). It is intentional from the learner’s point of view” (p. 22).

Some scholars have commented that the OECD definitions recommended above are unsatisfactory because they are not sensitive to changing educational landscapes and mainly place an importance on the intentionality of learners (e.g., Livingstone, 2001). Therefore, for the purposes of simplicity, the terms *traditional* or *formal* will be used interchangeably in the present research to describe any learning, education, courses, etc. that is administered through an educational provider offering conferred qualifications (e.g., a university). Meanwhile the term *informal* will act as generic catchall concept to include any education that takes place outside of

“traditional” contexts and could include participating in an open online course, but equally pertain to watching a television documentary or listening to a podcast.

**MOOC alternatives.** Commercial MOOCs such as those offered by Coursera are typically designed with the intention of enrolling tens of thousands of learners at a time. These courses will often have a strong university brand attached to them; indeed some of the world’s elite universities offered the earliest MOOC courses, and continue to do so at the time of writing. However, it is possible to deliver open online courses to smaller cohorts of learners independently of the commercial MOOC providers and use a more authentic open model incorporating OERs that can be shared and repurposed. An example initiative is the OERu, an online consortium made up of 37 universities around the world, providing short courses that can build towards an accredited qualification. The OERu utilises only Creative Commons-licensed OERs that can be also be curated by learners. Furthermore, all course content sits on open source platforms such as WordPress and MediaWiki.

**Sport psychology and open education.** The present research investigates design approaches to the creation of an open online course on the psychology of elite sport performance. Sport psychology is an applied discipline, which in the context of elite sport specifically harnesses psychological knowledge and skills to optimise performance and well-being (“Sport Psychology”, n.d.). Sport psychologists are often embedded into high performance programs and team environments, working closely with elite athletes as part of a multidisciplinary team of coaches, sport scientists, nutritionists, and administrators. Sport psychologists may design psychological skills training programs that help elite athletes cope with anxiety, improve concentration, or build confidence and resilience, to give but a few examples. Equally, sport psychologists may develop and provide interventions, such

as helping to create a team culture and build team cohesion, or provide psychological counselling to athletes who are underperforming.

There is a significant degree of public interest in the psychology of elite performance; a simple online search of the term “sport psychologist” or “sports psychologist” will return thousands of results on the Google News Channel. Newspapers or the media often interview professional sport psychologists when discussing athletic performance, particular when things go wrong (e.g., Patmore, 2014). Meanwhile, terms such as “mental toughness”, “psychological edge”, and “winning mindset” are used regularly in sport reporting and commentary.

Sport psychology has a long history, dating back as far the early 19<sup>th</sup> century in Germany (Terry, 2011) and the early 20<sup>th</sup> century in the United States (Weinberg & Gould, 2014) centred around the work of Coleman R. Griffith (1893-1966), and has developed into a thriving and empirically driven discipline. Sport psychology can be studied in many countries as part of psychology or sport science degrees, as postgraduate sport psychology degrees, and to some offer a career as a registered professional practitioner. Sport psychology has played an important role in understanding and facilitating elite sport performance both in terms of applied research and practice. Schinke, Papaioannou, and Schack (2016) argue that the “Olympic powerhouses” including many Western nations, China, and the former Soviet bloc countries have succeeded due to ground breaking advances in sport psychology, although professional knowledge has not been shared equally with emerging nations. Affiliated organisations such as the Asian-South Pacific Association of Sport Psychology (ASPASP) have been established to rectify this situation with a mission to facilitate the development of sport psychology throughout the Asia-Pacific region (“About ASPASP”, n.d.). ASPASP has 22 member

countries, including China, Australia, Singapore, Malaysia, and New Zealand, and has been established since 1989. It is one of the few professional organisations to have been active in the open education space, an area in which sport psychology content is limited.

An online search for open educational resources in sport psychology yields minimal results. A scan of OER Commons returns only ten OERs, meanwhile Coursera has run a few sport-themed courses around the business of sport, doping, and sport agency, but not sport psychology. The Open University's OpenLearn portal does contain a number of OERs, many of which have been added in 2016, however although these resources are freely available, it is not clear whether they can be reused or repurposed, as many are copyrighted to the BBC rather than holding Creative Commons licences. Furthermore, they do not currently constitute an organised course on sport psychology.

ASPASP members have participated in two open educational initiatives specifically related to sport psychology. The first is an open licenced textbook titled *Secrets of Asian Sport Psychology* (Terry, Zhang, Kim, Morris, & Hanrahan, 2014), that contains 22 chapters from practitioners across the Asia-South Pacific region each on a different sport, including cycling, rugby, and diving. The textbook contains best practice psychological skills training and culturally specific insights. Furthermore, all images for the textbook were curated from Creative Commons-licenced sources, and all textbook content shared under a CC-BY licence meaning that the work could be reused and adapted by others. The textbook was released over an extended period between 2012 and 2014 on an edited chapter-by-chapter basis meaning that content could be downloaded early before the book was finally compiled. The second initiative, developed in parallel with the textbook, was an

open online course titled *Elite Sport Performance: Psychological Perspectives*. This course will be described in more detail in Chapter 3 where its first iteration was evaluated and later redesigned (as described in Chapter 4) using best practice techniques in user-centred design principles and informed by self-determination theory (Deci & Ryan, 2000).

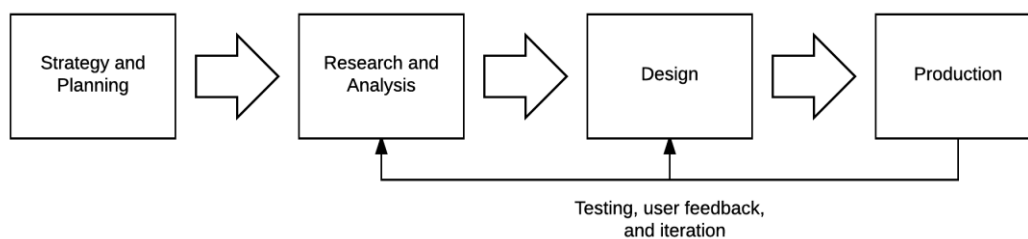
### **User-centred Design**

The term *design* is used in different ways in both natural and technical language and it is out of the scope of this thesis to address its ontological properties. There are many definitions of design, although a useful working definition is simply to describe design as a goal-oriented process of creating a product or service through discovery, ideation, and development (Gabriel-Petit, 2010). With its origins in human factors, ergonomics, human-computer interaction, and usability (Nielsen, 2012a), user-centred systems design (Norman & Draper, 1986) is a technique that has been adopted in a number of design industries. Now more commonly known as user-centred design, it is a design process that attempts to place the needs of the user before any other consideration when developing software or online services.

An international standard titled *ISO 9241-210:2010: Ergonomics of human-system interaction, Part 210: Human-centred design for interactive systems* (International Organization for Standardization, 2010) affirms six principles of user-centred design: 1) Design is based upon an explicit understanding of users, tasks, and environments; 2) Users are involved throughout design and development; 3) The design is driven and refined by user-centred evaluation; 4) The process is iterative; 5) The design addresses the whole user experience; and 6) The design team includes multidisciplinary skills and perspectives. The standard is useful, although not without criticism, specifically in terms of its practical implementation for a diverse

range of users (Hassenzahl, 2008). Nevertheless, the ISO standard provides helpful guiding principles that when coupled with good practice techniques from designers, may optimise the experience of using a product.

Creating a website, mobile app, or other online product for users with diverse backgrounds and personal contexts, presents a challenge for a designer. Specifically, understanding user goals and requirements, the tasks they will undertake, and the situations and environments in which they will interact with the technology, is vital to the success of the design project. In practical terms, the process follows a set of steps that can be summarised at a high level in Figure 2.1 below.



*Figure 2.1.* High-level overview of user-centred design process. Adapted from Magain, (2013).

The user-centred design process has several important components that are consistent with the principles laid out in ISO 9241-210 (International Organization for Standardization, 2010). First, the process involves high quality planning with a clear strategy that primarily addresses the user's experience of interacting with the product. Second, users are involved in the research and design process, particularly in terms of gathering requirements and obtaining feedback on the usability and subjective experience of interacting with the product. Third, the process is iterative based on the information gathered from users and other testing, and changes are made accordingly.

There are a number of established techniques used by professional designers that can assist with the user-centred design process, some of which will be described in more detail in Chapter 4. Examples from each stage include: a) evaluating the existing product to see if it fits current user needs e.g., by assessing web analytics; b) horizon scanning other products; c) interviewing users to gather requirements; d) task analysis; e) using personas to help represent users; f) developing scenarios of use; g) building an information architecture; g) wireframing to model the user interface; h) graphic and web design; i) site development; and j) usability testing. In the design techniques described above, multiple skills are required and ideally, as specified in the ISO standard, a multi-disciplinary team is required. However, it is common in design industries to find independent freelance designers (e.g., web designers) and developers (e.g., mobile app developers) who draw upon user-centred design techniques as best practice. It is this approach that is relevant to the present research in that user-centred design will inform the design process with support from a robust psychological theory to frame design decisions.

**User experience (UX) and positive computing.** The subjective experience of interacting with technology has become an area of great interest in both industrial design and human-computer interaction (Law, Roto, Hassenzahl, Vermeeren, & Kort, 2009), which more recently has felt the increasing influence of psychology. The term *User Experience (UX)*, commonly used in the creative design industries, has received some criticism in terms of being vague and ill defined (Hassenzahl & Tractinsky, 2006). However, it purports to describe the affective, hedonic, salient, and useful qualities of technology whilst drawing upon the fundamentals of user-centred design. Most recently a new concept, positive computing (Calvo & Peters, 2014; Sander, 2011), closely considers the positive role technology can play in

facilitating optimal well-being and human potential. Positive computing is an emergent area of research and directly draws upon the work of positive psychology scholars including Seligman (2002), Csikszentmihalyi (1991), Sheldon and Elliot (1999), Diener, Emmons, Larsen, and Griffin (1995), and Deci and Ryan (2000) as well as user-centred design and UX principles. The present research is influenced by ideas espoused in positive computing and in particular the natural compatibility of self-determination theory and user-centred design. The rest of this chapter will closely examine self-determination theory and its relevance to the present research, before presenting the research questions for each study.

### **Self-Determination Theory**

Self-determination theory (Deci & Ryan 2000; Ryan & Deci, 2000) is a macrotheory of human motivation, development, and well-being. The theory postulates that human beings are innately agentic and information seeking, with a natural tendency when healthy to grow, explore their environment, and integrate new experiences into an organised and coherent sense of self. Early work by the founders of self-determination theory, Ed Deci and Richard Ryan, examined motivational processes and in particular how reward contingencies (e.g., money) and the social environment (e.g., giving proximal feedback) affect intrinsic motivation (see for example, Deci, 1975; Deci & Ryan, 1980). Self-determination theory has developed considerably from its early roots and now consists of six sub-theories; which together attempt to understand sources of motivation, inherent universal psychological needs and their role in social and cognitive development, and factors that influence behaviour and well-being.

The theory is considered to be both “parsimonious” (Joussemet, Landry, & Koestner, 2008, p.198), and have “heuristic utility” (Vallerand, Pelletier, &



Koestner, 2008, p.257) in helping examine and explain a range of complex motivational phenomena across different life domains. Furthermore, it has become a growth area of applied research with interventions in a myriad of disciplinary contexts, including: education (e.g., Reeve & Lee, 2014; Taylor et al, 2014), organisational studies (e.g., Deci, Connell, & Ryan, 1989; Gagne & Deci, 2005; Gagné et al., 2015), sport and exercise psychology (e.g., Matosic, Ntoumanis, Boardley, Sedikides, Stewart, & Chatzisarantis, 2015; Vlachopoulos, Karageorghis, & Terry, 2000), psychotherapy (e.g., Britton, Patrick, Wenzel, & Williams, 2011), health and medicine (e.g., Hagger & Chatzisarantis, 2009; Niven & Markland, 2016; Zeldman, Ryan, & Fiscella, 2004), and recreational activities (e.g., Rigby & Ryan, 2016; Ryan, Rigby, & Przybylski, 2006; Weinstein, Przybylski, & Ryan, 2009).

Self-determination theory places an emphasis on individual “sense of choice, volition, and commitment” (Deci & Ryan, 2010, p. 2), which the authors describe as *autonomy*, one of three *basic psychological needs* along with *competence* and *relatedness*. These universal needs are the psychological “nutriments” (Deci & Ryan, 2002, p. 6) that are essential throughout life for “ongoing psychological growth, integrity, and well-being” (Deci & Ryan, 2000, p. 229). When these needs are satisfied, they predict a range of positive functional outcomes in terms of quality of motivation, self-regulation, organisation and integration, vitality, and well-being. Optimised social environments that satisfy basic psychological needs e.g., opportunities for choice, to be effective, or that involve close interpersonal relationships, are said to provide *needs-support*.

In comparison to the positive influence of needs satisfaction, external and controlling forces that are present in the social environment may act to thwart the satisfaction of basic psychological needs. Examples include contingent rewards and

punishments, negative or inauthentic feedback, or internalised psychological pressures (e.g., guilt). Such extrinsic forces can have a deleterious effect on quality of motivation as well as predicting negative behaviours and ill-being over time. The thwarting of autonomy, competence, and relatedness is defined as *needs frustration* and presents a range of negative functional outcomes including reduced persistence, low vitality, low self-esteem, seeking needs substitutes in the form of extrinsic goals (e.g., wealth and fame), compensatory behaviours that involve loss of self-control, and in extreme circumstances psychopathology (see Vansteenkiste & Ryan, 2013).

**Autonomy.** *Autonomy* literally means “self-governing” (Ryan & Deci, 2006) and is a foundational concept in self-determination theory that perhaps most distinguishes it from other prevalent theories of motivation and behaviour (e.g., Ajzen, 1991; Bandura, 1977; Skinner, 1953; Vroom, 1964). According to the theoretical framework, autonomy is core to understanding quality of motivation and behavioural regulation, and as previously described, is necessary for optimal human functioning.

Autonomy is characterised by authentic behaviours and actions that emanate from and are fully endorsed by the self. It sits in contrast to *heteronomy* in which behaviours are regulated by controlling forces outside of the “phenomenal self” (Ryan & Deci, 2006, p. 1562) and therefore not experienced as volitional. When an individual’s need for autonomy is satisfied, they are more likely to perform at their best (Adie, Duda, & Ntoumanis, 2008), be creative (Sheldon, 1995), engage and persist with activities (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004), feel psychologically well (Ryan & Deci, 2001), and form and maintain high quality social relationships (Deci & Ryan, 2014a).

Self-endorsement is a necessary antecedent of autonomy and can help to explain why doing tasks that are derived from an extrinsic source can be controlling or autonomous depending on the social context of that activity and the extent to which the activity is fully endorsed by the person doing it. Equally, the degree to which the value of an activity is internalised is strongly related to the extent to which autonomy is experienced. Having meaningful choice is also an important mechanism in satisfying the need for autonomy (Assor, Kaplan, & Roth, 2002; Moller, Deci, & Ryan, 2006), where choice under circumstances in which a person has relevant supporting information can allow the individual to explore ideas and make decisions.

Self-determination theory predicts negative psychological costs when autonomy is not experienced. Thwarting of autonomy can manifest as anxiety, negative affect, anti-social behaviour, and a host of other negative psychological consequences. In contrast, when the conditions to support autonomy are in place, an individual may likely act with vitality and energy. Furthermore, the product of this satisfaction of autonomy will be of higher quality over an extended time period in terms of effort, learning, and creativity.

Actions that emanate from the self can be demonstrated as intrinsically motivated behaviours in which an individual carries out a task for pure interest and enjoyment. Examples of such activities could be pursuing a hobby, reading a book, or independent learning. In each of these examples there is no separate outcome beyond partaking in the activity itself with willingness. However, some enterprises that humans undertake are not intrinsically motivating, but nevertheless can also be autonomous if the individual has internalised and identified with the activity's inherent value, or it is congruent with his or her sense of integrated self. An example could include an office worker staying late to complete a high quality piece of work;

the activity itself is not perceived as inherently interesting, yet nevertheless is important to the worker because it meets standards that are authentically valued.

***Intrinsic motivation.*** Intrinsic motivation can be defined as undertaking an activity for its perceived inherent value, or to put simply, because it is interesting and enjoyable (Deci & Ryan, 1985b). Within self-determination theory, intrinsic motivation is seen as a prototype of autonomy because there is no desired outcome that is separate from the activity itself, meaning that undertaking the activity is done solely through personal volition, self-endorsement, and choice. A body of empirical evidence has been gathered over recent decades that provides evidence of intrinsic motivation acting to promote deep learning and positive emotional affect, amongst other beneficial outcomes (Deci & Ryan, 2008a). The dynamics of intrinsic motivation has been articulated as *cognitive evaluation theory* (CET), the first sub-theory of self-determination theory, and examines the role of external social stimuli and events on intrinsic motivation.

A series of experiments beginning with Deci (1971), employed Soma cube puzzles to assess reward contingency effects on the interest and enjoyment of participants doing the puzzle. It was found that contrary to the received research consensus of the time, the introduction of tangible rewards such as money has an undermining effect on intrinsic motivation over time. Specifically, the effects of rewards were dependent on the interpretation or *functional significance* placed on the reward (Deci, Koestner, & Ryan, 1999). Furthermore, the role of proximal verbal feedback could equally enhance or diminish intrinsic motivation depending on whether it was perceived as informational or controlling in some way. Subsequent research demonstrated that other external forces had a potentially undermining effect on intrinsic motivation including: direct observation (Lepper & Greene, 1975), time

pressures and deadlines (Amabile, DeJong, & Lepper, 1976), and performance evaluation (Harackiewicz, Abrahams, & Wageman, 1987). It was therefore hypothesised that a shift in perceived locus of causality had a role to play in the regulation of intrinsic motivation (see Deci & Ryan, 1985b). In light of this growing body of empirical evidence, research was extended to include extrinsic motivation to examine causality, internalisation, and the regulation of motivation.

*Causality, internalisation, and regulation of motivation.* The notion of causality is an important concept within self-determination theory. Individuals in various contexts can act with autonomy, and therefore with volition and self-endorsement. Alternatively, they can behave under controls governed by their social environment or intrapsychic processes (e.g., guilt), and therefore under conditions of pressure and constraint. Building on the work of Heider (1958) and deCharms (1968), self-determination theory hypothesises a perceived locus of causality from the external world to the internal self that acts along a gradient of autonomy towards increased internalisation (Ryan & Connell, 1989). Self-determination theory has specified a number of motivational states along this continuum, with each corresponding to increasing levels of relative autonomy (Niemic & Ryan, 2009). In addition, this process of internalisation proportionally relates to increased integration and organisation of the self (Deci, Vallerand, Pelletier, & Ryan, 1991).

*Organismic integration theory* (OIT; Deci & Ryan, 2002), a second sub-theory of self-determination theory is specifically concerned with this regulatory mechanism and is illustrated in Figure 2.2. Organismic integration theory begins by characterising three broad motivational domains and a number of regulatory states. The first domain is amotivation and is simply the absence of any motivation and therefore consequent behaviour. It is regarded within self-determination theory as

unregulated and impersonal, and therefore neither autonomous nor controlled.

Amotivation is not causal and lacks any intention to act, and is therefore associated with a sense of learned helplessness (Seligman, 1972), e.g., a person does not believe he or she can achieve a task, or alternatively the individual does not identify with the task and no extrinsic force has the strength to compel him or her to do it. Second, intrinsic motivation, which has been discussed previously, and is a purely autonomous motivational state that supports highly regulated behaviours and describes the human organism working at a psychologically optimum level. Third, extrinsic motivation involves doing activities that are not necessarily interesting or enjoyable (unlike intrinsic motivation), and leads to a separate outcome from simply doing the activity itself. Furthermore, it may involve receiving an instrumental reward or social recognition for completing the task at hand.

Extrinsic motivation within self-determination theory is a complex entity to characterise, as it involves external factors, but is regulated along a locus of causality that moves from the outside world to the internal phenomenal self. This correspondingly reduces the instrumentality of the reward as the internalisation process correlates with increasing autonomy. The consequence of this increasing autonomy suggests that under optimal social-contextual conditions, some extrinsic forms of motivation are as durable as intrinsic motivation. This process is better understood by examining the regulatory states within extrinsic motivation. There are four types of regulation specified in organismic integration theory that specifically relate to types of extrinsic motivation, each of which correspond to increasing levels of autonomy as regulatory integration increases, and the perceived locus of causality moves inward:

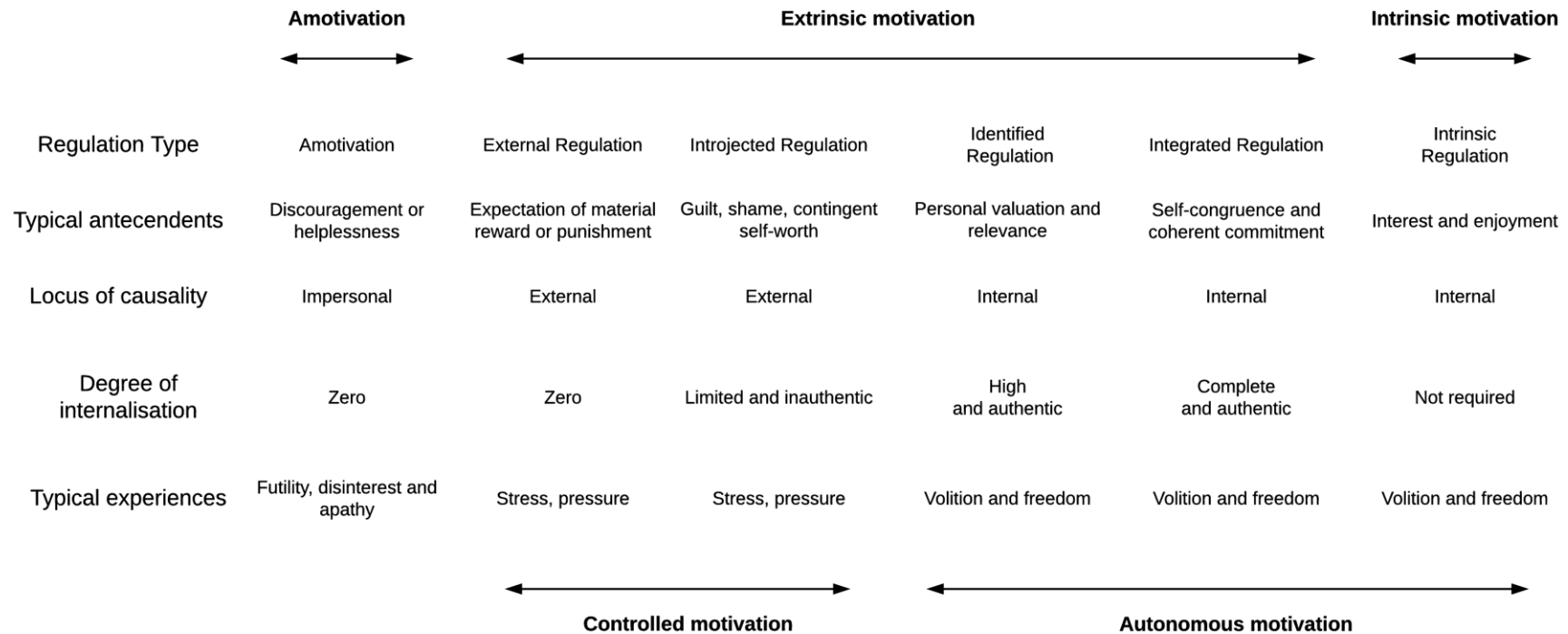


Figure 2.2. Organismic integration and different types of motivation. Adapted from Deci and Ryan (2000) and Vansteenkiste, Niemiec, and Soenens (2010).

- *External regulation* involves instrumental rewards or punishments to regulate behaviour specified by an external agent. It is the classic “carrot and stick” approach to motivation, where behaviour is contingent on receiving a reward or avoiding a negative separate outcome. Although this behaviourist approach (see Skinner, 1953) can be a powerful form of motivation, over time its importance will likely diminish, particularly when reinforcements are no longer available, (Vansteenkiste, Timmermans, Lens, Soenens, & Van den Broeck, 2008).  
Moreover, energy must always be expended to receive the reward so that as a consequence the reward drives behaviour. In terms of principles articulated in self-determination theory, the cause of the behaviour is external and therefore any motivation cannot be considered as driven from within; for example when the value of the behaviour is not internalised. In a meta-analysis of 128 studies, Deci et al. (1999) provided strong evidence to support the notion that tangible or salient material rewards tended to have a reduced effect on the quality of motivation over time. An example of external regulation could be the anticipation of a material reward from a teacher for completing a learning task.
- *Introjected regulation* directs onto the individual’s self-esteem or sense of self-worth. It is associated with controlling factors beyond the authentic self, such as meeting the values and expectations of others rather than personal ones, and placing internalised psychological contingencies on the self (or *introjects*).  
Examples of introjects include ego involvement, guilt, avoidance of negative affect, and contingent self-esteem, with each creating internal psychological pressure that undermines motivation over time (Vansteenkiste et al., 2010).  
Introjected regulation is therefore only partially integrated and not fully regulated by the organised self, or in other words it is external in terms of its cause. An



example could be undertaking a medical degree at university to avoid the anticipated feelings of guilt associated with disappointing a parent who had previously pressured their child in their studies.

- *Identified regulation* is associated with an individual taking on board the value of an activity even if it is not truly an integrated part of the self. The individual sees the benefits of what they do in relation to themselves e.g., their life goals or personal well-being, and accordingly wholeheartedly endorses the activity at hand. This form of regulation is characterised by an authentic understanding of the value of an activity and is therefore internalised, unlike introjected regulation, and consequently predicts positive functional outcomes in comparison. An example could be undertaking a course that has been identified by the learner as important to improve future career opportunities and job prospects.
- *Integrated regulation* is when the value of behaviour is fully assimilated as part of the self and is congruent with personal values and beliefs. Its functional outcomes in terms of quality are similar in nature to intrinsic motivation, but the source of motivation remains a separate outcome from the activity itself. Using an education example again, a person could register and engage with a course because in doing so they meet a fundamental personal value of learning throughout their life. Consequently, an individual is functioning at their optimum because the value of the outcome is congruent with their own sense of self. Although, this form of regulation is built on strong theoretical foundations, Van den Broeck, Ferris, Chang, and Rosen (2016) noted that identified and integrated regulated motivation are empirically difficult to distinguish, so for example the

Multidimensional Work Motivation Scale (MWMS; Gagné et al., 2015) only measures identified regulation, but does not include integrated regulation.

Researchers working from a self-determination theory perspective may often specify internally regulated forms of motivation (i.e., intrinsic, integrated, and identified motivation) as *autonomous motivation*, which in general predict positive functional outcomes over time. Conversely, introjected and externally regulated motivation is characterised as *controlled motivation* and in the main predict negative functional outcomes over time.

***Distinguishing autonomy from independence and freedom.*** In self-determination theory, autonomy is a distinct construct from independence. It can be distinguished by the assertion that being dependent on someone is not incompatible with being autonomous as long as that dependency is endorsed by the individual and not controlled. For example, in a close relationship partners are often mutually dependent on each other. Whether they feel autonomous or not depends on how autonomy-supportive they are to each other (Deci & Ryan, 2014a); one partner may be controlling the other through specific use of language or contingent affection, or be supportive of choices made in the pursuit of life goals.

Autonomy is also not freedom from social norms, the rule of law, or a passport to act without constraint. Indeed, having structure or rules can actually support autonomy assuming that the individual sees value in those rules. For example, a sensible driver is likely to concur with road rules because he or she understands the importance of those rules in maintaining safety on the roads. Equally, acting in an environment that has too many choices or is without boundaries may actually diminish levels of autonomy (and indeed competence) where the

individual is “paralysed” by choice, as they are unable to attach any meaning to the multitude of options placed before them (Schwartz, 2000).

***Cross-cultural considerations.*** Self-determination theory emphasises the universality of autonomy across cultures, lifespan, and life domains. Some critics of the theory (e.g., Markus & Kitayama, 2003) have suggested that autonomy is only relevant to Western cultures and is not a meaningful construct within collectivistic societies. Deci and Ryan (2014b) argue that the concept of autonomy has been misinterpreted as an analogue for independence or individualism, whereas they posit that individuals can still have a perceived sense of autonomy in activities that involve and benefit the whole group. Furthermore, those individuals within collectivistic societies may have their need for autonomy thwarted, due to controlling forces within their culture in a similar vein to the West. For example, the pursuit of money or fame as a life goal can undermine autonomy in Western contexts (Kasser & Ryan, 1996), but equally social pressure for high achievement on school children in a classroom environment in a collectivist context can have an undermining effect. Education standards in Singapore for example are extremely high, but not without costs in terms of the pressure and stress that students face. However, in a longitudinal study that involved an autonomy-supportive teacher training intervention program in eight schools in Singapore, Wang, Ng, Liu, and Ryan, (2016) report significant improvement in both self-regulation of learning and learning outcomes. Empirical cross-cultural studies have also provided evidence to support autonomy as a basic psychological need in collectivistic cultures (e.g., Chirkov, 2009; Deci et al., 2001; Kagitcibasi, 2005; Soenens & Beyers, 2012).

**Competence.** A second basic psychological need articulated in self-determination theory is the need for competence. Competence relates to an innate

need to learn and master new skills and abilities (White, 1959), and to be effective in activities that matter to the individual (see Bandura, 1977). Competence as a construct has long been empirically associated with motivation, although the role of autonomy support in enhancing competence differentiates self-determination theory from other motivational theories such as self-efficacy theory (Bandura, 1995), which negates the role of autonomy in being effective (Niemic & Ryan, 2009). More specifically, self-determination theory predicts that competence increases in a social environment that is autonomy-supportive and that feelings of competence will persist over time (e.g., Black & Deci, 2000). Some of the earliest research findings into intrinsic motivation found strong evidence between the interaction of autonomy support and competence in sustaining or diminishing intrinsic motivation (Deci, 1975).

A classic scenario concerning intrinsic motivation and competence as described by Deci and Ryan (2000), is the interaction between autonomy support and exploration in early childhood play. When young children play freely in the absence of parental interference, they are intrinsically motivated, at the same time learning and becoming more competent (in their hand-eye coordination, for example). The child is probably unaware that they are learning or that their competence is increasing, but they are making fundamental leaps in their development and fulfilling their natural tendencies for psychological growth. Coercive approaches on the contrary can undermine competence. For example, evidence has been offered to demonstrate that parental rewards and punishments for not eating vegetables is an ineffective approach to encouraging children to eat their greens or indeed learn about healthy eating options (Ryan, Patrick, Deci, & Williams, 2008).

**Relatedness.** The third and final basic psychological need specified in self-determination theory is the need for relatedness. Relatedness, like autonomy and competence, facilitates motivation and describes a human need to form close interpersonal relationships (La Guardia & Patrick, 2008), to feel connected to and care for others (Ryan, Huta, & Deci, 2008), and to belong to a group (Baumeister & Leary, 1995). Like competence, relatedness can be enhanced by autonomy support (Sheldon & Filak, 2008), but equally relatedness support can have a positive impact on autonomous forms of motivation (Vallerand et al., 2008).

Relatedness plays both a proximal and distal role in fostering intrinsic motivation depending on the context. Having immediate social connectivity is not a prerequisite for intrinsic motivation in many circumstances. When partaking in an activity, one can feel a rich sense of enjoyment and interest without the need for others to be present. However, close attachments and secure relationships do have a supporting function even in singular pursuits. For example, when a child practices an instrument, non-pressurised and warm and loving support from parents will likely have an additive effect on intrinsic motivation (Creech, 2010).

Relatedness in comparison to competence and autonomy is perhaps the least researched basic psychological need by scholars using a self-determination theory framework (Vallerand et al., 2008). A recent meta-analysis on basic psychological needs in work contexts by Van den Broeck et al. (2016) containing 99 studies with, collectively, over 45,000 participants found relatedness to be more strongly associated with intrinsic motivation than anticipated. This is an interesting finding given that relatedness is understood to have a distal role in intrinsic motivation (Deci & Ryan, 2000). However, it could be suggested that because these studies were in

workplace contexts only, relatedness has greater salience given that much of what we do at work involves groups.

**Measuring basic psychological needs satisfaction.** In accordance with the Baconian tradition of self-determination theory (Ryan & Deci, 2000), a number of researchers have developed scales for the direct measurement of pertinent constructs relevant to the theory. These scales are for use in laboratory or applied settings, where “social contextual variables” (p.69) are manipulated to assess their effect on internal processes and behavioural outcomes.

A family of scales have been developed over the last couple of decades that purport to independently measure the basic psychological needs of autonomy, competence, and relatedness. Two instruments, the Basic Psychological Needs Scale (BPNS) and Basic Psychological Need Satisfaction and Frustration Scale (BPNSFP; Chen et al., 2015) examine basic psychological needs in general life, with the latter also containing needs frustration items. Other basic psychological needs scales explore needs satisfaction in specific life domains and contexts. The Basic Psychological Needs at Work Scale (BPNWS), addresses basic psychological needs satisfaction in work and organisational domains (e.g., Baard, Deci, & Ryan, 2004). Recent studies reviewing the psychometric properties of the scale identify some psychometric issues; particularly an historical lack of stringent validation procedures and problems with cross-loading between factors in some circumstances (Brien et al., 2012; Van den Broeck et al., 2016). A further scale examining interpersonal relationships called the Basic Psychological Needs in Relationships Scale (La Guardia, Ryan, Couchman, & Deci, 2000) is also available, but although developed from the BPNWS, has not yet been validated as a separate scale beyond the original study.

The Basic Psychological Needs in Exercise Scale (BPNES; Vlachopoulos & Michailidou, 2006) assesses the perceived satisfaction of autonomy, competence, and relatedness gained from taking part in exercise. This scale has undergone a number of validation studies with cohorts from many countries (e.g., Liu, Chung, & Duan, 2013; Moutão, Serra, Alves, Leitão, & Vlachopoulos, 2012; Vlachopoulos, Ntoumanis, & Smith, 2010) with consistent reports of a coherent factor structure, good internal reliability, temporal stability, and invariance across gender (see also Moreno-Murcia, Martinez-Galindo, Moreno-Perez, Marcos, & Borges, 2012).

**Causality orientations.** Self-determination theory postulates that basic psychological needs satisfaction for high quality motivation, personality integration, psychological growth, and positive well-being are universal for all humans. The degree to which the interplay between individual differences and social environment throughout life has a moderating effect on global motivation processes is an area of investigation and discussion for many self-determination theory scholars (e.g., Hagger & Chatzisarantis, 2011, 2015; Olesen, 2011; Solberg, Halvari, & Ommundsen, 2013).

*Causality orientations theory* (Deci & Ryan, 1985a), a third sub-theory of self-determination theory, addresses individual differences in orientations towards informational aspects of the environment that are relevant to initiation and regulation of behaviour. To put it another way, the perception of the cause of events differs from person to person, leading to differences in motivational outcomes and behavioural regulation (Soenens, Berzonsky, Vansteenkiste, Beyers, & Goossens, 2005). Furthermore, these orientations specify the extent to which those behaviours are internally regulated, externally regulated, or unregulated across life contexts and domains (Deci & Ryan, 2008a).

Three causality orientations have been identified, each with different associations relevant to internalisation, motivation, and behaviour. The *autonomous orientation* describes individuals with a natural tendency towards their present environment and events that are taking place within it. These individuals are less likely to be motivated by external rewards alone and will orient towards identification or integration processes, or veritably be intrinsically motivated. Furthermore, according to the research findings of Koestner, Bernieri, and Zuckerman (1992), such individuals are more likely to be consistent in attitude-behaviour and personality-behaviour. The *control orientation* characterises individuals who orientate towards external contingencies, such as material rewards, or introjects such as obtaining the approval of others. Individuals with high levels of control orientation are less likely to integrate the value of extrinsic motivators and can be at greater risk for problematic and compulsive behaviours (e.g., Blevins, Banes, Walker, Stephens, & Roffman (2016); Knee, Neighbors, & Vfetor, 2001). The *impersonal orientation* provides an account for individuals who orientate towards amotivated states that lack intentional action. An impersonal orientation is associated with low self-esteem and general anxiety about sense of competence (Deci & Ryan, 1985a). As a consequence, in many circumstances they are unable to see how internal or external factors can shape events in their lives.

Causality orientations are relatively stable (Deci & Ryan, 1985a), but should not be considered in the same light as core personality traits such as the Big Five taxonomy, which in theory are less malleable to social contexts. In addition, they are associated with a range of regulatory and behavioural outcomes, and are not regarded as deterministic in terms of action. More specifically, causality orientations offer an indication of general tendency toward controlling or non-controlling events,



and are theorised to exist in differing amounts in all individuals. In addition, the relationship between autonomy and control orientations is orthogonal, as opposed to being on a continuum from control orientation to autonomy orientation. In other words, the degree to which an individual orientates to situations in which they can be autonomous and grow does not imply a corresponding deficit in their orientation towards controlling situations (Knee & Zuckerman, 1996).

Hagger and Chatzisarantis (2015) examined the role of competence-enhancing positive feedback on intrinsic motivation when undertaking a Soma cube puzzle in two groups who had been assessed to be predominantly autonomy-oriented or competence-oriented. Their empirical findings suggested that positive feedback enhanced levels of intrinsic motivation irrespective of causality orientations, or alternatively, the effect between positive feedback and causality orientations was additive rather than interactive. They also noted evidence to suggest that control-oriented individuals are significantly more susceptible to the undermining effects of extrinsic awards than autonomy-oriented individuals. The implications of their research supported the notion that basic psychological needs satisfaction through autonomy and competence support will have beneficial outcomes, irrespective of causality orientations. Undoubtedly, there is room for more research to be done in this nuanced space, as the mediating role of causality orientations seems dependent on a range of factors and contexts. Vansteenkiste et al. (2010) for example, suggested that more longitudinal research is required to better understand the stability of causality orientations.

***Measuring causality orientations.*** The General Causality Orientations Scale (GCOS; Deci & Ryan, 1985a) captures individual scores for autonomy, control, and impersonal orientations as articulated in causality orientations theory. The scale

utilises a set of vignettes to describe situations in which the participant can orient towards scenarios in which they are autonomous (e.g., acting with volition), controlled (e.g., exclusively focusing on contingent rewards), or impersonal (e.g., not feeling competent to act at all). The short version of the scale comprises 12 vignettes, each containing three items, to encompass a 36-item scale. All sub-scales have demonstrated acceptable to excellent internal and test-retest reliability (Koestner & Zuckerman, 1994; Weinstein & Hodgins, 2009). There has, however, been some confusion as to how to satisfactorily operationalise the scale and as Koestner and Zuckerman (1994) suggest, the utility of the scale may be enhanced when used as a typological rather than dimensional scale.

Scales that consider causality orientations in specific contexts are rare, in spite of a recommendation in Deci and Ryan's 1985 paper introducing the GCOS, that more specific scales should be developed. Examples that do exist include the Causality Orientations at Work Scale (Deci & Ryan, 1985a) and the Exercise Causality Orientations Scale (ECOS; Rose, Markland, & Parfitt, 2001). Citations or validation studies of either scale are sparse in the literature and other contextualised orientations scales in other domains including education have not been created.

**Eudaimonic well-being.** In addition to motivational and integrative processes, self-determination theory also explores human well-being and in particular how supporting or thwarting basic psychological needs may foster or diminish healthy functioning and wellness across life domains and cultures. *Basic psychological needs theory* (BPNT; Ryan & Deci, 2017) is a fourth sub-theory of self-determination theory and specifies how autonomy, competence, and relatedness are essential to the development and well-being of fully functioning individuals. Of particular interest, the concept of *eudaimonia* is proposed as a model of positive

well-being (see for example Deci & Ryan, 2008b). An Aristotelian term, which has been translated to mean *flourishing* (Ryan, Curren, & Deci, 2013), eudaimonia may be characterised in terms of personal growth and reaching maximum human potential. Eudaimonia as a well-being concept has been examined extensively in philosophy and psychology, perhaps most recently through the field of positive psychology (e.g., Huta & Waterman, 2014; Seligman, 2002). Eudaimonia can be juxtaposed with *hedonia*, which from its ancient Greek roots, has been translated to mean *happiness*, and can be conceptualised as the subjective experience of enjoyment and satisfaction of life events, an absence of painful psychological experience, or simply pleasure. Waterman (2007) characterises hedonia as distinct from eudaimonia in that hedonia is a *goal* of pursuits that may be realised, whereas eudaimonia is a *product* of the cultivation of self-realised activities (p.612). For example, one can feel happy when playing a musical instrument (hedonia), but one can also play the highest quality music through personally valued dedication and persistence to learn a musical instrument (eudaimonia). At times learning to play the instrument is challenging and perhaps not always enjoyable, but the inherent effort and personal growth in the learning process results in a eudaimonic form of well-being.

Ryan et al. (2008) propose a model of eudaimonia in terms of four components: i) pursuing first order goals that have inherent worth or intrinsic value (e.g., for personal growth), as opposed to goals that are instrumental or second order (such as the pursuit of wealth or fame); ii) being autonomous; iii) being mindful and acting with a sense of awareness and; iv) satisfaction of the basic psychological needs of autonomy, competence, and relatedness. Furthermore, the authors propose that the first three elements outlined above predicate on the final element in terms of

offering eudaimonic well-being (see also Ryan & Martela, 2016). To put it another way, the satisfaction of a person's basic psychological needs allows him or her to pursue intrinsic first order goals, to act with agency and self-endorsement, and to be mindful and self-aware.

A eudaimonic perspective on well-being using the self-determination theory framework is an area of growing interest. Notions of cultivation of positive well-being through intrinsically driven and authentic behaviours are being applied in clinical (Ryff, 2014), technology and media (Rigby & Ryan, 2016), and work settings (Turban & Yan, 2016). There is a degree of synergy between eudaimonic concepts and self-determination theory that can be applied to a number of life domains. More broadly, self-determination theory has evolved into a detailed and robust theory of motivation and behaviour, and perhaps its greatest utility comes from its practical applications, these will be explored next.

**Goals.** *Goal contents theory* (GCT) is a fifth sub-theory of self-determination theory and specifies how the contents of life goals can relate to psychological and physical well-being, self-esteem, and vitality (Kasser & Ryan, 1996). Aspirations that focus on extrinsic goals such as wealth, fame, personal image, or contingent worth are associated with lower measures of vitality and self-actualisation. In contrast, life goals that are associated with intrinsic aspirations including self-acceptance, affiliation with others, learning and personal growth, community feeling, and physical health are related to higher levels of well-being and lower measures of psychological distress. When differentiating goal contents, the theory distinguishes the nature of the goal from the reasons underlying it, i.e., “*what*” the goal is from “*why*” the goal is pursued (Deci & Ryan, 2000). For example, if an adult enrolls as a mature student on an evening course, their goal could be to obtain a qualification

(the “what”), whereas their reason could be because their partner wants them to earn more money (the “why”—an extrinsic and potentially pressuring reason).

Alternatively, the student may have enrolled in the understanding that they enjoy learning (an intrinsic goal), or that they see the value of the qualification in enhancing the quality of their life, and indeed their whole family, by making them more employable (an identified goal). Therefore the causal source of the goal is an important regulatory mechanism in predicting behavioural and well-being outcomes (Gunnell, Crocker, Mack, Wilson, & Zumbo, 2014).

Vansteenkiste et al. (2004) examined goal contents in relation to academic motivation and quality of learning of college student preschool teachers. In their study, they matched intrinsic or extrinsic goals with interpersonal contexts that were either autonomy-supportive or controlling. Each condition was used to examine the quality of learning of information on the subject of ecology in which a scenario was presented that the information learned could later be imparted to toddlers by the participants in a preschool environment. Goals were framed in terms of community contribution e.g., recycling to help the environment (intrinsic goals), or in terms of external gains e.g., monetary savings (extrinsic goals). Furthermore, the language of the learning materials was framed as either autonomy-supportive e.g., “if you choose to recycle” or controlling e.g., “you must recycle”. The strongest predictor in terms of quality of measured learning outcomes came from the intrinsic goals and autonomy-supportive condition. The authors suggested that an individual is able to attend to and internalise the value of an intrinsic goal when it is presented in an autonomous-supportive way. Furthermore, these findings showed that intrinsic goals and autonomous support when combined offer a strong combination, positively predicting deeper learning, persistence, and optimal performance, that also involve

behaviours above and beyond the original task. Intrinsic goal framing such as in the above study, presents a potentially powerful approach to educational design in that providing rationales for learning tasks with intrinsic value rather than for separate or extrinsic outcomes, may improve the quality of learning (Vansteenkiste, Lens, & Deci, 2006).

### **Applications of Self-Determination Theory.**

A review of recent literature on applications of self-determination theory includes such diverse applications as: walking and exercise programs (e.g., Fenton, Duda, & Barrett, 2016; Niven & Markland, 2016), nutritional and diet interventions (e.g., Leblanc et al., 2016), diabetes care (e.g. Raaijmakers et al., 2015), English as a Foreign Language (EFL) teaching (e.g., Agawa & Takeuchi, 2016), job design in the voluntary sector (e.g., Güntert, Strubel, Kals, & Wehner, 2016), and video game design (e.g., Deterding, 2015).

**Education.** The application of self-determination theory to educational contexts has a long tradition. Researchers have investigated classroom motivation and engagement (e.g., Ryan & Deci, 2009), autonomy-supportive verses controlling teaching practices (e.g., Sarrazin, Tessier, Pelletier, Trouilloud, & Chanal, 2006), parental roles in student learning (e.g., Roth, Ron, & Benita, 2009), need satisfaction in deep and conceptual learning (e.g., Benware & Deci, 1984; Jang, Reeve, & Halusic, 2016), and the potentially undermining effect of standardised testing on student motivation and teaching climate (Deci & Ryan, 2016). Interventions around how to create an autonomy-supportive classroom environment are a common theme in the self-determination theory educational literature. A meta-analysis by Su and Reeve (2011) on the effectiveness of 19 autonomy-supportive intervention training

programs, conceptualises autonomy support in education around a number of interpersonal characteristics including:

nurturing inner motivational resources, providing explanatory rationales, relying on non-controlling language, displaying patience to allow students the time they need for self-paced learning to occur, and acknowledging and accepting expressions of negative effect. (p. 161)

Self-determination theory research has not been confined to autonomy support in school education, but has also been applied in adult and higher education contexts. In a study of an elective medicine course in organic chemistry, Black and Deci (2000) found evidence to suggest that initial measured levels of relative autonomy, when controlled for the effects of causality orientations, predicted both interest and enjoyment, and persistence. Moreover, perception of instructor autonomy support was related to increased self-regulation, better course performance, and decreased anxiety in a student group with initially low relative autonomy and also a second cohort of students who began with high relative autonomy. The findings of Black and Deci's research suggest that the benefits of an autonomy-supportive environment are universal and similar findings are confirmed throughout the literature (e.g., Bonneville-Roussy, Vallerand, & Bouffard, 2013; Jang, Reeve, & Deci, 2010; Reeve, Jang, Carrell, Jeon, & Barch, 2004).

The basic psychological need of competence also has an important role to play in terms of performance and persistence in higher education contexts. Litalien and Guay (2015) for example, examined dropout intentions of doctoral students undertaking a PhD thesis in a large French speaking university in Canada. In two studies, the authors found perceived competence to be a strong determinant of drop out intentions. Furthermore, autonomous forms of motivation had a tendency to

predict competence in terms of perceived effectiveness and capability and relatedness as indicated by frequency and quality of student-advisor relationship. Meanwhile, faculty support and student-advisor relationships also impacted upon drop out intentions, at least indirectly. There are few studies examining persistence and academic performance at university level using a self-determination theory perspective, although Guiffrida, Lynch, Wall, and Abel (2013) found similar positive correlates between basic psychological needs satisfaction and intention to persist even when considered against the moderating role of gender, ethnicity, and socioeconomic status.

In regard to instructor training on providing basic psychological needs support, a recent study by Aelterman, Vansteenkiste, Van Keer, and Haerens (2016) evaluated the introduction of a training program for physical education teachers undergoing continuing professional development. They developed a path model that inferred that the experience of need satisfaction during training increased the likelihood that teachers would in turn make changes to their teaching practice. In other words, the basic psychological needs training had some role to play in changing teachers' beliefs and becoming more flexible in their thinking about teaching practice.

Perhaps surprisingly, there is a paucity of research specifically about adult or informal education in the self-determination theory literature. Houde (2006) and Pew (2007) both noted the possible applications of self-determination theory to andragogy (theoretical and practical approaches to adult learning), although cite other theories at the same time. Noels, Pelletier, Clément, and Vallerand (2003) found that motivation to learn a second language could be validly assessed using self-determination theory constructs and measures. However, few self-determination



theory practitioners have examined concepts of either informal education or lifelong learning despite seeming compatibilities.

*Self-determination theory and open education.* Open education presents many opportunities for personal growth and learning in the absence of external pressures due to its accessible and informal qualities. Research that links self-determination theory to open practice is currently limited but has the potential to grow, as a case can be made that there are synergies in philosophical ethos. Simpson (2008) for example, when writing in general about motivating learners in open and distance learning environments suggested that a substantive motivational theory was required. One of the theories suggested was self-determination theory, and in particular the author recognised the concept of meaningful choice as an important aspect of motivation. Although meaningful choice alone is not enough to fuel autonomy, it was a helpful observation, at a time when open education was evolving.

On the emergence of MOOCs, Beaven, Hauck, Comas-Quinn, Lewis, and de los Arcos (2014), based at the UK's Open University, recognised the challenges of balancing self-determination and the facilitation of an eight-week MOOC. Others have utilised self-determination theory as a frame of reference for understanding MOOC engagement (e.g., Hew, 2015, 2016). Meanwhile, a few researchers have used self-determination theory measures to assess MOOCs. For example, findings from Zhou (2016) in a Chinese MOOC context, indicated that autonomous motivation plays a central role in terms of continuance intention and therefore learner-centred design approaches should be a priority for designers. Beaven, Codreanu, and Creuzé (2014) assessed levels of intrinsic motivation in a language MOOC using the Intrinsic Motivation Inventory (IMI; Plant & Ryan, 1985; Ryan, 1982). Perhaps of most relevance in terms of the unique context of MOOCs, the

researchers identified factors that created pressure and tension for MOOC participants, including imposed time limits and issues of perceived efficacy in language learning skills.

Self-determination theory measures have been used to evaluate basic psychological needs satisfaction in a MOOC environment. Durksen, Chu, Ahmad, Radil, and Daniels (2016) have undertaken to this author's knowledge one of the earliest published evaluations of a MOOC that empirically measured satisfaction of basic psychological needs. Using Bayesian network (BN) analysis, the researchers proposed that the need for relatedness requires much closer attention than it currently is getting in a MOOC context. It is perhaps worth noting however, that the MOOC being assessed was not developed specifically using a self-determination theory framework to underpin its design.

*Self-determination theory and online education.* The delivery of learning materials, particularly in the higher education sector, has been radically disrupted by the Internet and web technologies. The role of technology and its effectiveness in learning is an area of great debate (see for example, Cuban, 2001); however, only a few researchers have empirically examined the role of technology in learning environments using a self-determination theory perspective. Sørenbø, Halvari, Gulli, and Kristiansen (2009) investigated university and college teacher continuance of e-learning tools in the classroom. They concluded from their experimental findings that the basic psychological need of competence coupled with perceived usefulness is the strongest predictor of usage continuance. The importance of autonomy in their study was less clear, although they accepted that there were a number of limitations including participant demographics and the sensitivity of the measures chosen.

In an investigation into a university online course, Chen and Jang (2010) emphasised the importance of ongoing support of basic psychological needs within an online learning environment (from both the course facilitator and other students). In their study of an online learning management system, satisfaction of basic psychological needs had a mediating effect on learning outcomes, presumably by supporting intrinsic or other autonomous forms of motivation. Meanwhile, Roca and Gagné (2008) demonstrated that users of an e-learning training system were more likely to continue usage when feeling competent in an autonomy-supportive environment. Finally, Tschofen and Mackness (2012) noted the conceptual links between autonomy as characterised in self-determination theory and understanding individual behaviours within networked learning contexts. The authors also highlighted individual skill levels in using technology and the usability of the learning interface as factors that may have a negative effect on competence in the online environment.

**Self-determination theory and technology.** Technology is both pervasive and ubiquitous, seemingly impacting on everyday life in most parts of the world. The utilisation of technology for motivational research and applied intervention programs is an area of increasing interest in self-determination theory research. Indeed, as indicated earlier in this chapter, applying self-determination theory in technology settings has synergies with the emerging discipline of positive computing. In particular, technology has the potential to create environments and climates that are optimised towards autonomous forms of motivation leading to positive life change and supporting eudaimonic well-being. An example phenomenon observed by some key self-determination researchers is the deep motivational pull of video games and in particular their strong association with intrinsically motivated behaviours e.g.,

exploration of virtual environments and seeking new challenges. There is some evidence to support the notion that immersive video games meet the basic psychological needs of autonomy and competence, central to intrinsic motivation, by providing a opportunities for mastery, a sense of presence, exploration, and intuitive controls (Przybylski, Rigby, & Ryan, 2010; Ryan et al., 2006).

Technology that gives timely and contextual motivational messaging for behavioural change is also relevant. Smartphone applications, wearable technology, and social media offer technological platforms for intervention in many diverse areas, including health and well-being, education, and productivity. Self-determination theory predicts that these technologies should have features that assist people by supporting ongoing basic psychological needs satisfaction, if the intervention is to be effective and sustainable. However, many new technologies do not have needs-support implicitly built into the design. A content analysis by Choi, Noh, and Park (2014) revealed that only 10% of smoking cessation smartphone apps specifically addressed all three basic psychological needs with too much focus on extrinsic motivators in the majority of apps. Apps that inform users that smoking is bad for health without pertinent supporting information for example, were coded as non-supportive of autonomy, whereas apps that allowed users to connect with others or to join help organisations were coded as supportive of relatedness.

In one of the first studies investigating wearable activity trackers through a self-determination theory lens of enquiry, Karapanos, Gouveia, Hassenzahl, and Forlizzi (2016) reveal a two dimensional structure driven by the needs for physical thriving and relatedness. Further investigation into the domain of physical thriving suggested that wearers not only experience growing competence, but also feelings of autonomy as they gain useful informational feedback on their progress, whilst also

choosing activities to meet movement goals. The authors argue that manufacturers of wearable technologies do not pay close enough attention to motivational theories such as self-determination theory, and in particular the psychological nuances involved, which may explain why many wearers give up wearing them within six months of purchase.

In the realm of social media usage, Krishen, Berezan, Agarwal, and Kachroo (2016), suggest that supporting basic psychological needs satisfaction in using social media is an imperative. Furthermore, they concluded that certain broad features are important in needs satisfaction, specifically building affinity and belonging as necessary precursors to satisfying relatedness, interactivity to help satisfy competence, and innovativeness to satisfy needs for autonomy. Although their research had some acknowledged methodological limitations, the authors make some helpful observations around the importance of innovative design and interactivity in online user experiences.

Within a broader context of crafting positive user experiences through online technology, a self-determination theory perspective is invoked by Hassenzahl (2008) to explore emotional states and saliency of need when using technology. The author reported that design features that support autonomy and competence act as a driver for positive experience while using technology. Although understanding of ubiquitous use of technology is still in its infancy, in the main new technology has the potential to contribute to people's lives in a positive way if it addresses fundamental human needs. Self-determination theory with its focus on being autonomous and volitional, on being effective and seeking new challenges, and on relating and connecting to others, seems to have great utility in designing meaningful online experiences. It is therefore placed centrally in the present research, which

involves the redesign, and evaluation of an open online course on the psychology of elite sport performance.

### **Summary and Research Questions**

This chapter has provided a background on the history and current state of open education, the affordances of OERs, and the evolution of open online courses, particularly MOOCs. The chapter has also noted that there are very few open resources in sport psychology, particularly in sharing best practice in elite performance to a wider audience. It has reviewed evidence of the growing importance of user-centred design as a practical approach to providing meaningful and engaging experiences when using modern technology. Finally, it has provided an in-depth review of self-determination theory, a theory that has generated a huge body of empirical evidence in understanding the underlying dynamics of motivation. It has also provided many examples in which self-determination theory can be applied to optimise motivational outcomes in a number of life domains, including education and technology.

Open online courses are a relatively new and unique educational context in that barriers to access are low and there are few disincentives to drop out. New design approaches should therefore be researched and evaluated. The aim of the present program of research is to design and evaluate an open online course where a key design principle is to optimise the online learning environment towards meeting the basic psychological needs of the learner. A course titled *Elite Sport Performance: Psychological Perspectives* will be redesigned from first principles using best practice user-centred design techniques, open technologies and self-determination theory to underpin the design. Furthermore, basic psychological needs

satisfaction and associations with engagement and persistence will be measured and evaluated as part of the research.

A first objective in any design process is to evaluate and learn from earlier approaches. Study 1 in Chapter 3, seeks to better understand activity and engagement for the first iteration of the *Elite Sport Performance: Psychological Perspectives*, which was run in late 2013, and was not associated with the present researcher. The OERu hosted this first version, but it was not deemed a success in terms of engagement by those involved with the development. Using predominantly web analytic data the course activity is interpreted and evaluated, with recommendations made for Study 2. The research question for Study 1 therefore is:

- *What patterns of online activity emerged from the first iteration of the open online course and how can this information support the design of a second iteration?*

Study 2 in Chapter 4, encompasses a step-by-step redesign of *Elite Sport Performance: Psychological Perspectives* using best practice techniques in user-centred design and underpinned by self-determination theory. An argument is made that addressing basic psychological needs satisfaction at the design stage is central to optimising the conditions conducive to motivation and engagement. The research question for Study 2 is:

- *What design features should be considered when building an open online course that focuses on fostering learner autonomy, competence, and relatedness?*

Study 3 in Chapter 5, describes the evaluation of a completely new version of *Elite Sport Performance: Psychological Perspectives*, which was launched on a new learning platform in late 2015 and ran for approximately four months. It places an emphasis on quantifying self-determination constructs with course activity.

Specifically, changes in basic psychological needs satisfaction in relation to activity and engagement is assessed. The mediating role, if any, of causality orientations is interrogated, plus the suitability in terms of goodness of fit of the self-determination theory model analysed. Concurrently, web analytic measures are described to provide evidence of activity and engagement. Finally, qualitative and illustrative measures taken post-course from course enrollees are described. The research questions for Study 3 are as follows:

- *What patterns of activity and engagement were present in the course and how do such patterns compare to the first iteration?*
- *What were the demographic and intentional characteristics of the learners and did these characteristics have any associations with engagement?*
- *Does motivational orientation (general causality orientation) predict course progression in the context of this open online course?*
- *For those who completed the course, do levels of basic psychological needs satisfaction (autonomy, competence, and relatedness) significantly increase during the duration of the course?*
- *What qualities determined engagement or non-engagement in the course?*



### **Chapter 3: Study 1 – Evaluating the First Iteration of *Elite Sport Performance: Psychological Perspectives***

This chapter will describe the first study in the present research in which web analytic data were examined to identify trends of activity and engagement within the first iteration of *Elite Sport Performance: Psychological Perspectives*. It will begin by describing the features and purpose of web analytics, before providing some contextual information about the course, which ran for 6 weeks in November and December 2013. The chapter will then present web analytic data, which not only provided information about the characteristics of the course, but also in the context of the present research serves the purpose of providing insights that informed the design process articulated in Study 2. Finally, the chapter will discuss the results in the light of the theoretical framework adopted for the present research.

#### **Web Analytics**

Although there is no single definition of web analytics, Farney and McHale (2013) offer a practical description as “the process of gathering and interpreting the virtual traffic on a website to learn how users interact with a site” (p.3). Web analytics can also be considered in the same light as business analytics and data science, a process through which insights are derived from large datasets using sophisticated analytics technologies. Such information is used to inform business strategy and future directions. For more information, Chen, Chiang, and Storey (2012) offer a compact but thorough overview of the analytics landscape.

Web analytic tools developed by large technology companies including Google and IBM are commonly hosted online and accessible through a web browser. They present data visually that can be filtered, segmented, or concatenated, and have powerful reporting features to assist in decision-making. They are typically used by businesses to help gain insights into online customer behaviour, or to evaluate the

success of an advertising campaign. Their value as information gathering tools is highlighted by Fagan (2013), using them in a library context, and characterises them as “a potential treasure trove of valuable decision-making information” (p.32).

**Google Analytics.** The data for this study were mainly derived from online activity measured through Google Analytics. Google Analytics is a free service offered by Google that allows website owners to observe online activity and develop insights into how their website is being used. Web analytic metrics are recorded upon any user interaction with a webpage that has Google specific web-tracking code embedded. When a user interacts with a webpage, for example clicking on a link to go to another webpage, data is sent back in real time to a Google server. This data can then be viewed by the website owner via a customisable dashboard interface.

Figure 3.1 illustrates an example Google Analytics dashboard. Here, the website owner is able to see an overview of website traffic over a defined time period. The left-hand menu contains links to a range of measures including data on user behaviours, demographics, and access agents. There are also opportunities to customise reports and make use of various administration tools. Google Analytics records no personal or identifiable information; a de-identified token is generated for each user that is then associated with the data collected. The Google Analytics dashboard acts as an interface to interrogate, sort, and filter data that can then be used to make design decisions. For example, a website owner may find that an important webpage is not being visited, conclude that the link to the page is not prominent enough, and make the relevant adjustments to the design of the website.

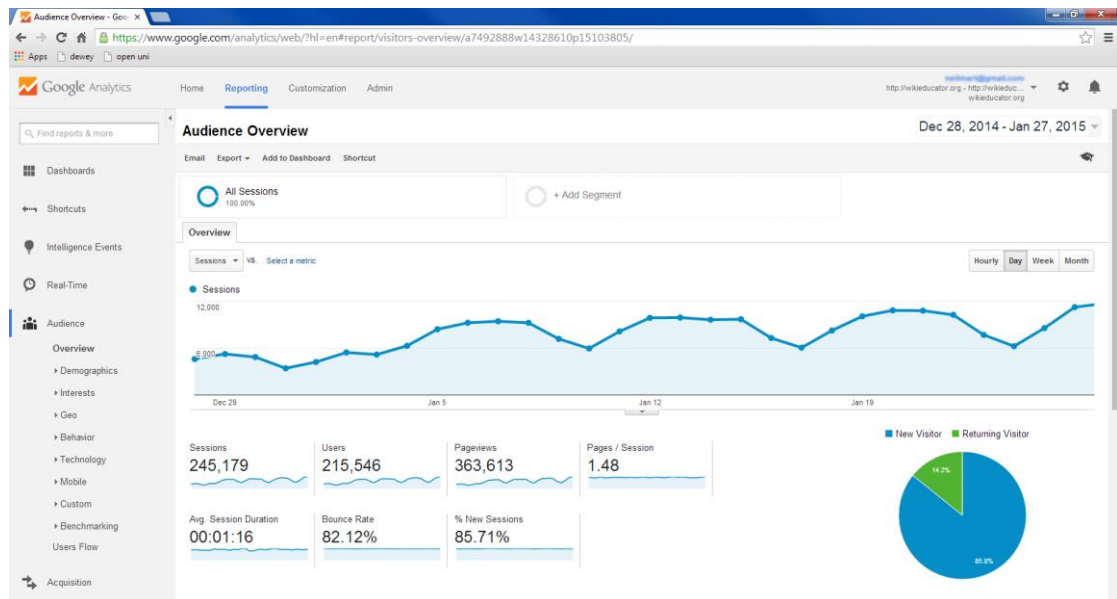


Figure 3.1. Example Google Analytics dashboard.

In addition to the Google analytics data, supplemental course engagement and activity data were sourced from analytics provided through the video streaming service Vimeo, which hosted course video content.

**Using web analytics insights to inform design.** As indicated in the previous chapter, user-centred design can be viewed as a process rather than a single methodology (Gabriel-Petit, 2010). A starting point therefore, is to gather and interpret pertinent existing data that when analysed, will provide insights to guide new design and development. At this moment, it is worth defining what is meant by the term *insight*. As Chang, Ziemkiewicz, Green, and Ribarsky (2009) observed, “insight” can have more than one meaning. In cognitive science, it is used to describe a visual input or pattern recognition that in an instance solves a problem—an “aha” moment. However, a broader definition is to consider an insight as information that furthers knowledge or helps in the understanding of a dataset. For example, Google Analytics may report low access and engagement with content from smartphone users, therefore providing a useful insight that the website is not optimised for mobile devices and therefore needs redesign.

## The Present Study

The first iteration of the *Elite Sport Performance: Psychological Perspectives* was hosted by the OERu Foundation and officially ran from 1 November to 13 December 2013. Figure 3.2 provides a screenshot of the homepage and the full course can be viewed at <http://wikieducator.org/OERuESP1>. The course convenor and a small team of learning designers at the University of Southern Queensland (USQ) developed *Elite Sport Performance: Psychological Perspectives* as an OERu *micro course* (an intended 40-hour course). As indicated on the course website, the target audience were a) learners who wished to develop their interest in the psychology of elite sport, perhaps with a view to pursuing further formal study in the area; b) existing practitioners in the world of sport who wish to enhance their knowledge and understanding of sport psychology; and c) others who seek to extend their knowledge and understanding of sport psychology. It should be noted that the present researcher had no role in the design of this first iteration of the course.

The screenshot shows the course page for 'Psychological Foundations of Exercise and Sport' on the OERu WikiEducator platform. The page is titled '#OERuESP1 - An OERu course' and includes a navigation menu with options like 'Home', 'Course registration', and 'Course resources'. The main content area is divided into several sections:

- Course Identifiers:** A table listing course details:
 

Course tag	#OERuESP1
Level	1 <sup>st</sup> Year bachelor's degree
Notional learning hours	160 (40 hours per micro-course)
Enrolment status	Course runs 1 November to 13 December, 2013
Original OERu developer	University of Southern Queensland
- Course description:** A text block explaining the course's focus on the psychological aspects of exercise and sport, and its relevance to various professionals. It includes a video player for 'ASPASP' from the University of Southern Queensland.
- Course selection:** A section titled 'Four micro-courses make up the Psychological Foundations of Exercise and Sport course. You can study these micro-courses in any order.' It lists four courses: 'Elite Sports Performance: Psychological Perspectives', 'Recreational Sport: Psychological Perspectives (Coming Soon)', 'Exercise: Psychological Perspectives (Coming Soon)', and 'Public Health: Psychological Perspectives (Coming Soon)'. Each course has a small thumbnail image.
- Course registration:** A section with a login/register prompt and a registration form for 'Elite Sports Performance: Psychological perspectives'. It includes a note: 'Your registered name, country and blog address will be displayed publicly. By registering for this course you agree to the OERu terms of service.'
- Microblog feed:** A section showing recent posts from users like 'Paris Restegar' and 'Rhow.landicho'.

Figure 3.2. Screenshot of the first iteration on the OERu WikiEducator platform.

**Course platform.** The course was hosted on the WikiEducator platform and all content was presented as OERs under a Creative Commons Attribution licence. WikiEducator has functionality similar to Wikipedia and is powered by the same free open source software called MediaWiki. As a wiki, its purpose within the OERu is to act as a platform for the collaborative development of OERs and registered users with the right access credentials were able to create and update content. For the first iteration of *Elite Sport Performance: Psychological Perspectives*, the course development team had access to edit all pages. Meanwhile learners had access to post to specific pages relating to learning tasks and activities, including a microblogging tool called WikiEducator Note and a shared resource bank.

In addition to course content on WikiEducator, all video content was hosted on Vimeo. Vimeo is a video hosting and sharing service similar in functionality to YouTube. Unlike YouTube, it has no advertising and in general has higher quality content albeit significantly fewer videos and a smaller user base. In recent years Vimeo has become a popular tool for both educators and professional filmmakers (Larson, 2013) thanks in part to its professional and aesthetic qualities. In the context of the first iteration of the course, there were five videos hosted on Vimeo, each embedded into course pages using standard HTML embed code. The University of Southern Queensland, whose media production team created the course videos, owned the Vimeo account. This account included access to video engagement data that will be examined later in this study.

**Course structure.** Course content was structured into four main areas: (a) a course registration area, (b) a resources area containing relevant learning content, (c) information about the development team, and (d) a resource bank where learners could share information related to learning tasks. Additionally, the resources area

was divided in four distinct sections: (a) an introduction, (b) a context evaluation task, (c) psychological influences on performance, and (d) a final assessment.

***Learning activities and intended outcomes.*** The course design drew upon a *pedagogy of discovery* (Taylor & Mackintosh, 2011), a form of enquiry-based learning, in which learners must discover, critically analyse, and share open digital resources as part of their learning. Intended learning outcomes expected at course completion included learners:

1. Understanding how psychological processes can affect sport performance.
2. Having awareness of a range of psychological strategies that athletes can draw upon to regulate and improve their performance.
3. Being competent in a range of digital tools including wikis and microblogs (including WikiEducator Note and Twitter).
4. Discovering and sharing OERs relevant to sport psychology and elite performance.

Sample learning activities included:

1. Offering an introduction to other course participants using the WikiEducator Note microblog and articulating reasons for doing the course.
2. Watching videos that introduced concepts relevant to each learning activity.
3. Reading about applied psychological interventions in open access journals.
4. Sharing discoveries in to the course resource bank and offering reflections, commentary, and analysis.
5. Providing feedback to peers.

The intended final assessment was for learners to build a mental training program (also known as a psychological skills training program) for an elite athlete in a sport of their choice. Learners also had access to early chapters from the open

textbook *Secrets of Asian Sports Psychology* (Terry et al., 2014) as a resource. The book contains original content from a range of experts in the field as well as Creative Commons open licensed images sourced from different places.

**Measurement of activity and engagement.** In common with all courses hosted on the WikiEducator platform, Google Analytics code was embedded into all pages to facilitate analysis of activity and engagement. As part of the OERu's commitment to open data, access to the web analytic data were freely shared and therefore provided activity and engagement data for the present study. In addition, the University of Southern Queensland Media Services team provided access to Vimeo data, and other indicators of activity and engagement were directly taken from WikiEducator, which is online and freely accessible. Within this context, the term *activity* relates to indicators of page access and web traffic, whereas *engagement* refers to general patterns of behaviour including time spent on webpages (and presumably interacting with the content), posting on WikiEducator, and playing videos.

**Research question.** The research question for Study 1 is: *What patterns of online activity emerged from the first iteration of the open online course and how can this information support the design of a second iteration?*

## **Method**

**Participants.** The analytic data relevant to this study was derived from the online behaviours of individuals who interacted with the course platform throughout the presentation of the course. The open access nature of the course meant that these participants could be drawn from those who enrolled on the course and those that did not, as registration was not a prerequisite to view the course content. At the end of the course, the WikiEducator platform recorded that there were 51 registrants from

20 countries. However, as will be demonstrated below from the analytic data, there is evidence to suggest that there were more participants who did not register, but had some interaction with course content.

**Materials.** A web browser to access the web analytics tools and Excel for handling exported data were utilised in the study.

**Procedure.** Permission to view OERu Google Analytics data were granted on request by the administrator of the WikiEducator platform. Due to the fact that the data were open data and non-identifiable, ethical approval for the present study was exempt from ethical review as advised by the University of Southern Queensland Ethics Coordinator. Google Analytics data were accessed via a web browser and the date range from November 1 to December 13, 2013 was selected in the interface, corresponding to the course duration.

The course data for *Elite Sport Performance: Psychological Perspectives* was a small part of a much larger dataset for all courses hosted by the OERu and therefore needed to be isolated. *Segmentation* is a web analytic procedure that allows a subset of data to be extracted and examined in detail (Beasley, 2013). For the purposes of this study, a segment was created that drilled down to accesses for *Elite Sport Performance: Psychological Perspectives* and therefore ignored any irrelevant data from other courses hosted on WikiEducator. In addition, a second segment was applied to remove referrer spam and thereby cleaned the data. Referrer spam is created by various agents for nefarious purposes using online programs called bots, which crawl websites in an effort to drive traffic to their website and therefore increase their search engine position (see Jones, 2015). This process generates access data in Google Analytics that links back to the deceptive website, and is inauthentic in terms of human activity. This data were removed by importing a segment,



provided for free by a Canadian company called Loganix, which contained a filter that removed any recorded access data from known non-credible sources. In general, this removed only a small amount of data in the present study, but is good practice and the procedure was used again in Study 3, where its impacts on the quality of data were larger.

The activity measured by Google Analytics for *Elite Sport Performance: Psychological Perspectives* was derived from a subset of a wider set of data, and is important to note that it used standard sampling techniques to arrive at the figures. During the course presentation period of 6 weeks, the WikiEducator platform received over 400,000 pageviews in total and it is from this data that sampling occurred. The technical reason for this is to reduce query latency when attempting to retrieve data, or in other words, avoiding long waits to receive a report. Google indicated that the report gives a high degree of accuracy, as the sampling rate is very high (approximately 83%), but optimised for the data processing speed of the tool (“How sampling works”, 2016). Therefore all figures provided are based on an 83% sample and rounded automatically.

***Generating reports.*** A range of reports can be generated through Google Analytics, each containing specific measures of activity and engagement. The following reports were created and exported to Excel: a) Overview of activity; b) Activity throughout the duration of the course; c) Mean session duration over time; d) Bounce rate over time; e) Pages viewed per session; f) Most accessed content; g) Geographical location of users; h) Access devices; i) Traffic acquisition channels and link referrals. All reports once generated were downloaded and exported into Excel for cleaning, sorting, and the creation of graphs, tables, and charts that illustrate course activity and engagement. Within these reports were web analytic

metrics that require a brief explanation of the terminology used within them and these now follow.

*Session.* A session is a series of interactions between a user and a website and is taken from the time a user enters a website to the time they leave. During a session, Google Analytics will record the number of pages visited and the duration of the session, as well as information on the location and access device of the user.

*Users, new users, and returning users.* A user as recorded by Google Analytics corresponds to an individual who visits a website. A unique token (or cookie) that anonymously identifies the user is generated at the very first interaction with a website and if this token persists over time (e.g., the user does not clear their cache), then all data is cross-referenced against that user. A user is designated as a *new user* on visiting the website for the first time, and the user is redesignated as a *returning user* on a second and subsequent visits. The ratio of new to returning users therefore is a measure of the “*stickiness*” of a website (Lin, 2007) so that a high proportion of returning users suggests a degree of brand loyalty to the website.

*Pageviews and unique pageviews.* A pageview (as opposed to page view) is recorded each instance a user visits a page and can happen multiple times in a session, meanwhile a unique pageview is recorded only once per page per session and is recorded as a separate measure by Google Analytics. Consequently, the number of unique pageviews is always lower than the number of pageviews because a user may revisit a page a number of times during a session, but is only recorded as a single unique pageview.

*Bounce rate.* The bounce rate describes the proportion of users who visit only one page before leaving the site and can be considered as a measure of engagement. In general terms, a high bounce rate suggests limited engagement with a website

because it describes many users visiting a single page and then leaving. Some caution should be applied when considering bounce rate, as it must be viewed within the context of use. For example, if users were directed via a link to a single page of information e.g., embedded in an email or through an online advertisement, then a high bounce rate would be recorded even though many may have engaged with the content. Therefore bounce rate as a metric of engagement should not be viewed in isolation but within the context of other usage trends.

*Location.* Google Analytics detects the country from which users are accessing the website based on the first few numbers of the Internet Protocol (IP) address of their access device. Furthermore, if required, Google Analytics can drill down to specific cities and regions. Cumulative sessions, pageviews, or bounce rates for example, can be cross-referenced against specific locations. For instance, a website owner may find a particularly high bounce rate from a specific country and may want to investigate further.

*Technology.* Google Analytics also determines the access device and browsing software that is used to access the website. The access device can be a personal computer, tablet, or mobile phone. Again, access metrics can be cross-referenced against specific types of technology and therefore offer potential insights and inform future redesign based upon known patterns of activity.

*Traffic acquisition channels and link referrals.* Finally, the mechanism through which users reach a website is recorded by Google Analytics. Traffic acquisition channels are different ways of entering a website and examples include via search engines, social media, links on other websites, and direct access (e.g., clicking on an embedded link in an email or by typing the web address directly into a browser). Meanwhile, link referrals are external webpages that directly link to the

website. In the example of *Elite Sport Performance: Psychological Perspectives*, it was anticipated that link referrals would most likely come from webpages promoting the course.

**Additional Vimeo video engagement measures.** The video production manager at the University of Southern Queensland granted permission to access video analytics data recorded via the USQ Vimeo account. As with Google Analytics, the date range was adjusted on the Vimeo Analytics Dashboard (see Figure 3.3, below) to encompass the course presentation time period. The data were then exported as an Excel spreadsheet for further cleaning, sorting, and creation of graphs and charts.

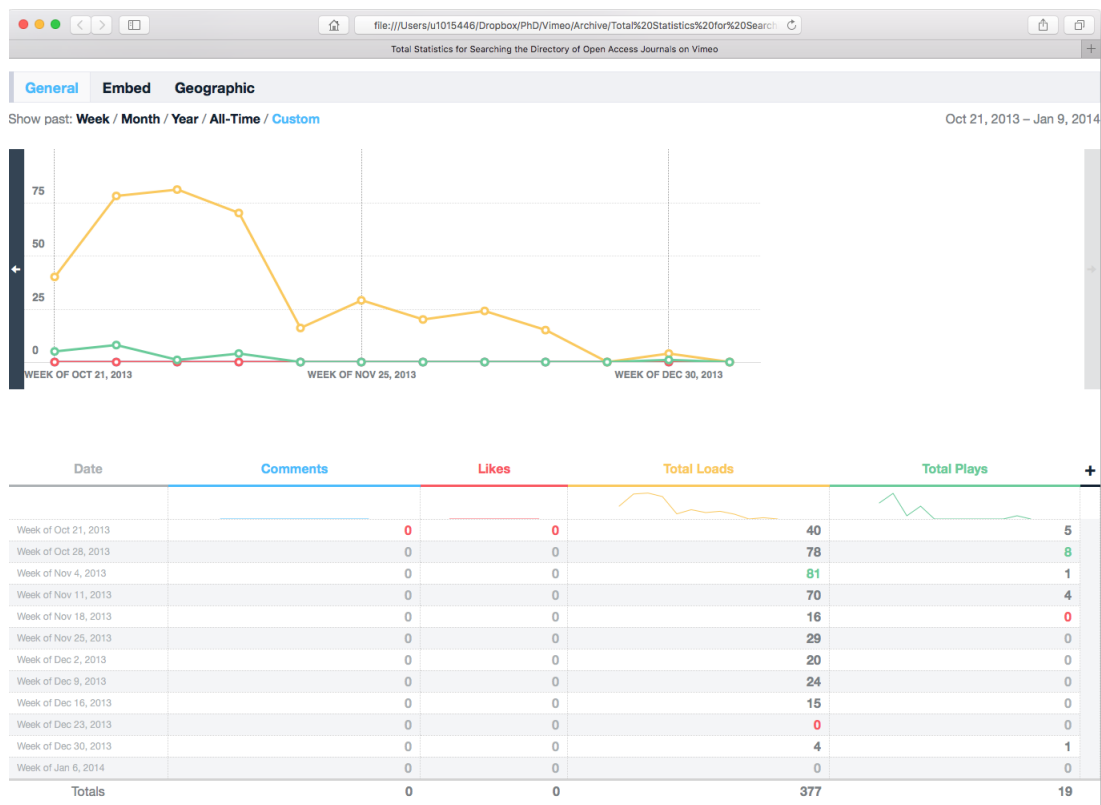


Figure 3.3. Example Vimeo Analytics dashboard.

The following video access and engagement metrics were collected:

- *Video loads.* The number of times a video was loaded. This value does not describe whether the video was played or not, as it corresponds to a user loading a page with a video embedded within it.
- *Video plays.* The number of times the user pressed the play button on the video. It does not indicate whether the video was finished or not.
- *Video finishes.* The number of times the video was watched to completion.
- *Video downloads.* The number of times the video was downloaded as opposed to being streamed. A video download represents a user preference for saving the video onto a local computer.

***Other indicators of engagement via course interface.*** In addition to collecting web analytic access and engagement data, the course pages specific to *Elite Sport Performance: Psychological Perspectives* were inspected for evidence of activity. More specifically, the WikiEducator website presented information on the number of registrations, as well as indicators of engagement such as course participants posting on the WikiEducator Note microblog, or contributing content to the resource bank.

## **Results**

Table 3.1 presents an overview of activity as recorded by Google Analytics during the presentation of the course between 1 November and 13 December 2013 inclusive. The figures indicate limited activity during the presentation period with 151 users and 2,540 pageviews recorded. These figures also act as a benchmark for later comparison. It is worth noting that the course content was open to the world and did not require registration credentials to be viewed.

Table 3.1

*Overview of activity for duration of Elite Sport Performance: Psychological Perspectives as measured by Google Analytics, WikiEducator, and Vimeo 1 November - 13 December 2013*

<b>Measure</b>	<b>Value</b>
Time (days)	43
Sessions	389
Pageviews	2,540
Unique pageviews	1,552
Total users	151
Mean pageviews per session	6.53
Mean session duration (min:sec)	7:13
Bounce rate (%)	37.8%
New users (%)	28.5%
Returning users (%)	71.5%
Registrations as recorded by WikiEducator	51
Posts to WE Note (WikiEducator microblog)	20
Sharing of resources in course resource bank	11
Video loads	1,386
Video plays	63
Video finishes	22

**Activity throughout the duration of the course.** The Google Analytics data recorded over the 43-day duration of the course evidenced a dramatic decline in activity over time. The bulk of activity took place in the first 20 days, however there was a strong drop-off from Day 18 onwards. Figure 3.4 shows the number of pageviews over time. Activity is relatively high at the start of the course and sees a couple of peaks in the first 2 weeks, before a sustained and terminal drop off.

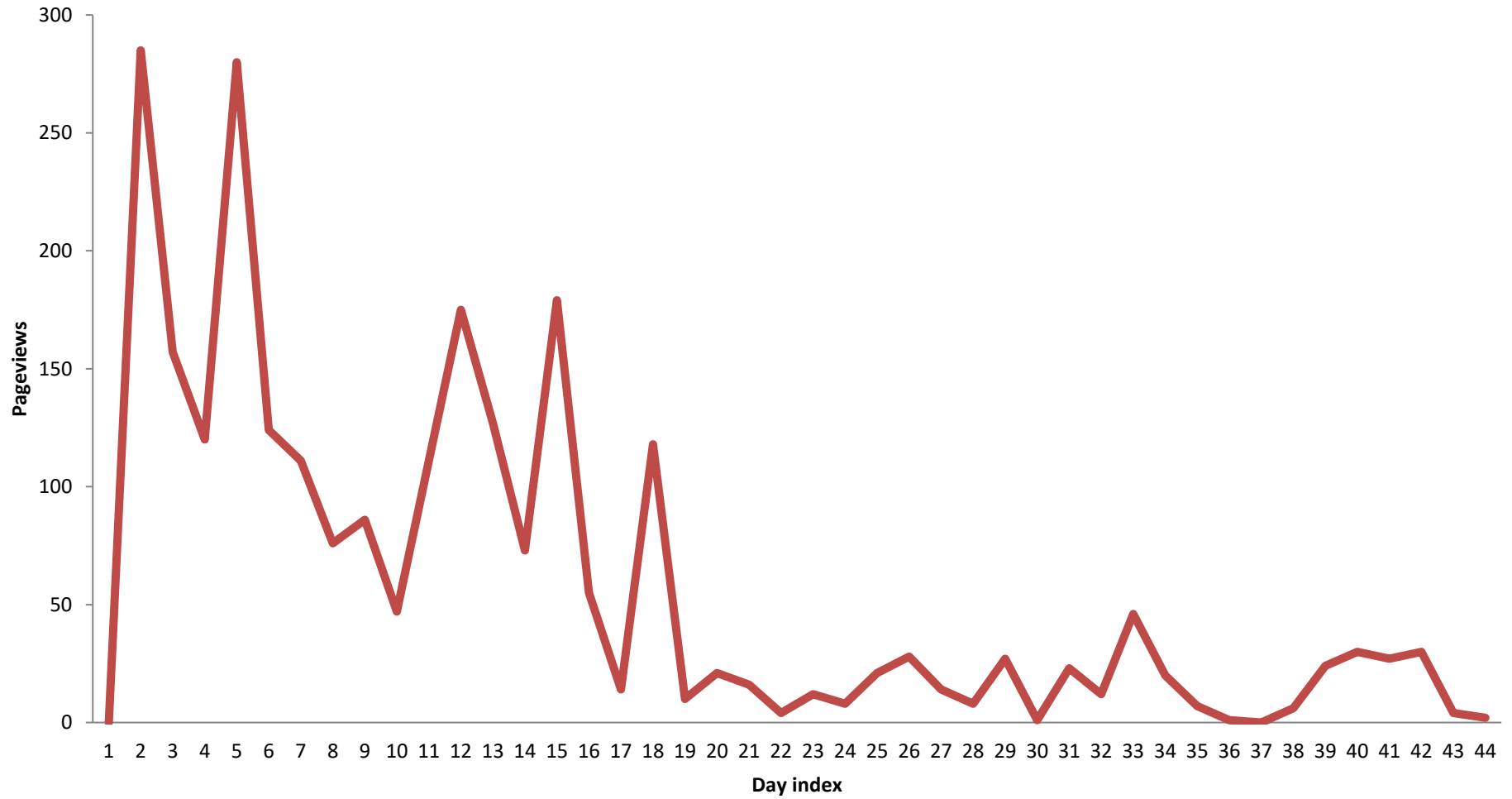
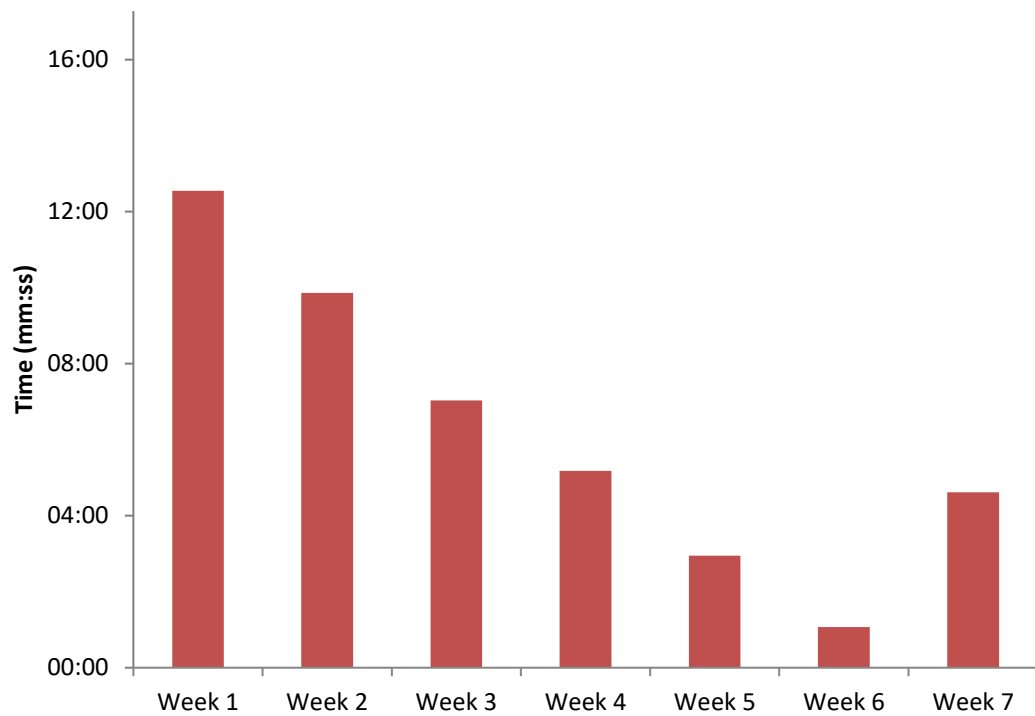


Figure 3.4. Pageviews over time as recorded by Google Analytics ( $N = 2,540$ ).

**Mean session duration over time.** The time spent interacting with the course is shown in Figure 3.5. The chart describes the mean session duration per week for all activity on the course. The mean time spent in the course is proportionately higher in the early weeks of the course then later on, remembering that there was limited activity later in the course.



*Figure 3.5.* Mean weekly session duration time during lifespan of course.

Table 3.2 describes the breakdown of session time and number of pageviews for all course sessions and illustrates examples of limited but deep engagement with 59 sessions between six minutes and half an hour, and 23 sessions over 30 minutes.



Table 3.2

*Breakdown of course session durations*

<b>Time range (min:sec)</b>	<b>Sessions</b>	<b>Pageviews</b>
0:00 – 0:10	157	175
0:11 – 0:30	19	52
0:31 – 1:00	28	92
1:01 – 3:00	45	267
3:01 – 6:00	58	518
6:00 – 30:00	59	833
> 30:01	23	603

**Bounce rate over time.** An overall mean bounce rate of 37.8% for *Elite Sport Performance: Psychological Perspectives* was within acceptable levels throughout the course, i.e., below 40% (Perzyńska, 2015). Figure 3.6 illustrates the bounce rate for the duration of the course. Remembering that the number of sessions reduced considerably towards the end of the course lifespan, bounce rate correspondingly increased. The increased bounce rate was consistent with a general reduction in engagement

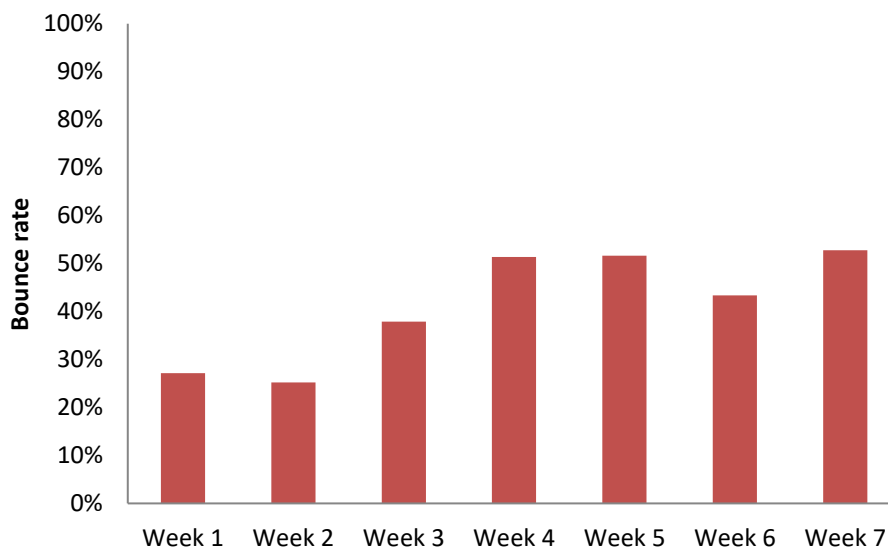
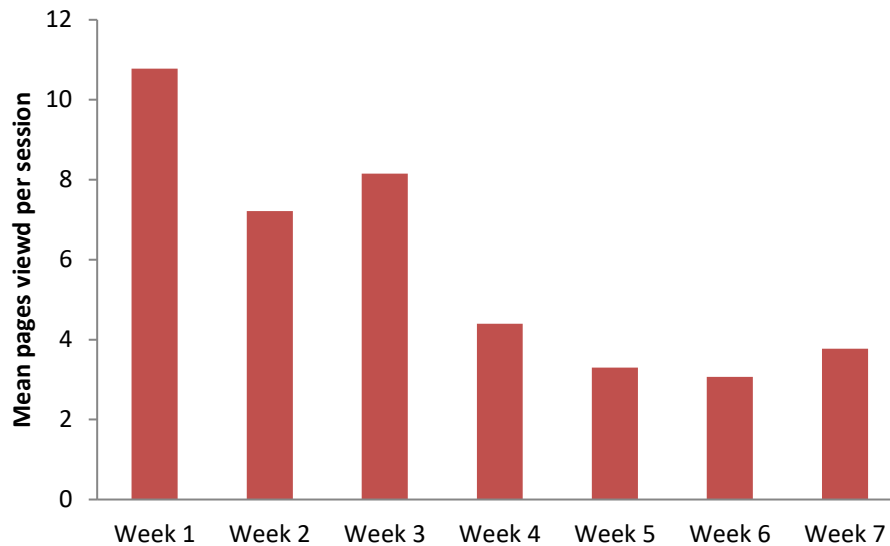


Figure 3.6. Mean weekly bounce rate during lifespan of course.

**Pages viewed per session.** The mean number of pages viewed per session declined over time as illustrated in Figure 3.7 below, this once again represents an overall drop in engagement over time.



*Figure 3.7.* Mean number of pageviews per session over lifespan of course.

**Most accessed content.** The ten most popular course content pages accessed on the course are described in Table 3.3. Other page accesses indexed by Google Analytics refer to dynamically generated pages e.g., unique login pages and are therefore not included. Closer inspection of the data indicates significantly less engagement with later learning activities. Of the learning activities Task 1 received the most accesses (266 pageviews), followed by Task 2 (88 pageviews), Task 4 (27 pageviews), and Task 3 (26 pageviews).

**Geographical location of access.** Google Analytics data indicated that online activity was geographically spread across 21 countries. Table 3.4 shows the geographical location of access during the course period.

Table 3.3

*Most accessed webpages 1 November 2013 - 13 December 2013*

Rank	Page Title	Pageviews	Unique Pageviews	Entrances
1	Course homepage	406	258	201
2	Course resources	340	177	56
3	Learning task 1	266	142	31
4	Resource bank	170	114	9
5	Post a Wiki Educator note	151	91	25
6	Learning task 2	88	58	4
7	Registration page	47	28	5
8	Learning task 4	27	13	0
9	Learning task 3	26	12	0
10	Course development team	6	6	0

Table 3.4

*Breakdown of geographic location of access 1 November 2013 - 13 December 2013*

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Mean duration (min:sec)
Australia	117	8%	9	12%	9.26	8:42
Japan	63	89%	56	70%	1.73	1:01
Iran	33	3%	1	24%	5.06	6:56
Canada	31	10%	3	51%	5.55	14:42
Singapore	31	19%	6	77%	3.65	1:42
Philippines	29	38%	11	45%	5.69	8:38
Oman	19	0%	0	11%	9.79	9:38
Finland	15	20%	3	27%	7.27	10:59
Indonesia	14	36%	5	21%	12.50	15:45
Lithuania	10	50%	5	30%	13.00	4:47
Poland	5	0%	0	20%	4.60	5:18
China	4	25%	1	100%	1.00	n/a
UK	4	25%	1	25%	12.75	879.25
Vietnam	3	66%	2	67%	2.00	14:39
Germany	2	100%	2	100%	1.00	n/a
Fiji	2	50%	1	100%	1.00	n/a
Malaysia	2	100%	2	0%	5.00	6:53
Thailand	2	100%	2	50%	14.50	11:51
Spain	1	100%	1	100%	1.00	n/a
New Zealand	1	0%	0	100%	1.00	n/a
USA	1	0%	0	100%	1.00	n/a

The majority of page accesses came from countries within the Asia-Pacific region including Australia, Japan, Iran, Philippines, and Singapore. This is not surprising, as the course was promoted via the Asian-South Pacific Association of Sport Psychology (ASPASP) and associated networks. The data in general points to pockets of engagement across the region. Activity was particularly high in Australia where the course was designed and the driver of this activity may have come from promotion of the course at a local level. Further interrogation of the data revealed that 95% of Australia-based sessions recorded from the state of Queensland (where the University of Southern Queensland is situated). Countries where bounce rate is low, coupled with a relatively high mean number of pages visited and longer session times, suggest stronger engagement. So for example, engagement was strongest in Australia, Iran, and the Philippines, but interestingly not in Japan despite the larger number of sessions. A possible explanation for this phenomenon is provided in the acquisition data below.

**Access characteristics.** Google Analytics data provided information about access technologies and acquisition of users. An overview is provided below.

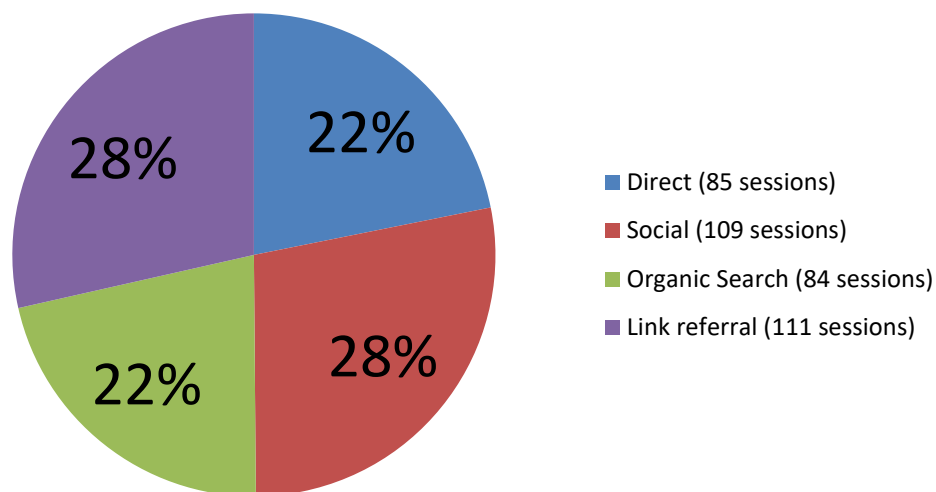
**Access device.** Table 3.5 illustrates that 93% of all sessions came via a desktop computer, with other access coming through mobile phones and tablets. A possible reason for the disproportionately lower access through mobile devices is that the WikiEducator user interface was not optimised for interaction through mobile devices.

Table 3.5

*Device access characteristics (all sessions) 1 November to 13 December 2013*

<b>Device type</b>	<b>Sessions</b>	<b>% New sessions</b>	<b>New Users</b>	<b>Bounce Rate</b>	<b>Pages per session</b>	<b>Mean session duration (min:sec)</b>
Desktop	368	26%	96	36%	6.53	7:32
Mobile	14	71%	10	71%	2.07	1:20
Tablet	7	71%	5	57%	4.86	3:07

**Acquisition.** Acquisition refers to how users reach a website; for example, a user may come to a website via a link on another website, or input the address directly through their browser. Figure 3.8 illustrates that there was a range of channels through which the course acquired traffic with no specific channel particularly dominant. A total of 28% of sessions came through links shared on social media including Facebook and Twitter, 28% of sessions came from other sites linking to the course, such as from a link on an external website to the course on WikiEducator. Organic search accounted for 22% of acquisition, i.e., searching on terms that are relevant to the content of the website e.g., sport psychology. Finally, 22% of sessions came through direct entry, that is, by directly inputting the link into a browser or through a bookmarked or saved link.



*Figure 3.8.* Traffic acquisition data demonstrated a range of channels through which users reached course content.

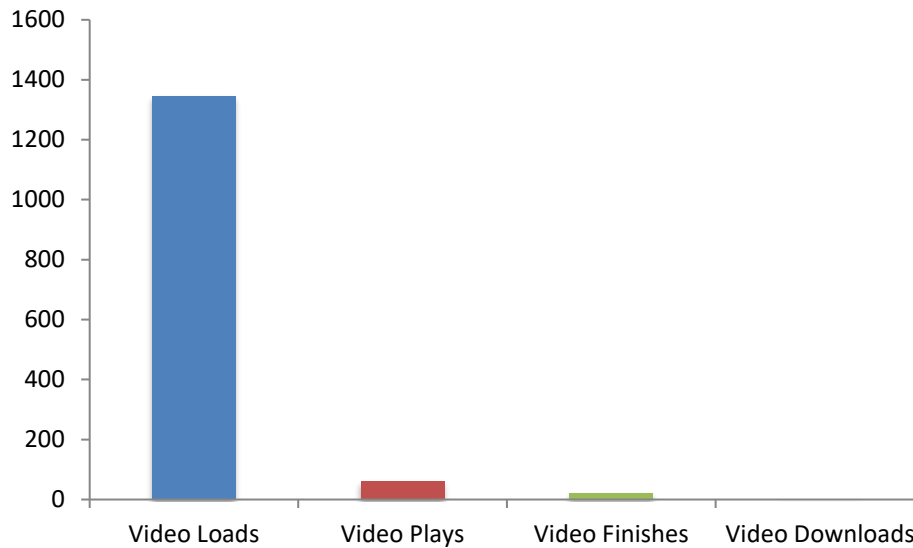
Table 3.6 lists the websites that linked directly to the course, and it can be seen that the highest amount of external traffic came through Facebook. It is also noticeable that the website of the Japanese Society of Sport Psychology (JSSP) acted as a referral website, and accounted for a large proportion of Japan-based access as described previously. The link referral data when coupled with the geographic data above, suggests that the Japanese cohort of users did not engage with the course at all, possibly due to language differences.

Table 3.6

*Link referrals from external websites and social media*

Website	Sessions	% New sessions	New Users	Bounce Rate	Pages per session	Mean session duration (min:sec)
Facebook	87	17%	15	58%	5.11	5:23
Google	65	1.5%	1	4%	12.11	7:02
JSSP	62	90%	56	71%	1.50	0:26
OERu	33	0	0	21%	5.39	5:06
Yahoo	17	0	0	35%	2.65	3:53
Twitter	16	6%	1	13%	9.69	28:59

**Engagement with video content.** Figure 3.9 aggregates metrics for access to course videos including video loads, video plays, video finishes, and video downloads. These figures are solely for the five videos developed for the course.



*Figure 3.9.* Cumulative measures for video content embedded into course.

From the chart, it can be seen then there were significantly more video loads ( $n = 1,346$ ) than plays ( $n = 63$ ), finishes ( $n = 22$ ), or downloads ( $n = 3$ ). Vimeo automatically records a video load when a page with a video embedded is browsed, but the video is not necessarily played. Meanwhile a play, finish, or download represents an intentional interaction with the video. Further separation of the data into measures for each video show a similar pattern in terms of video engagement, and furthermore replicates the Google Analytics data with reference to the decline in course activity over time (see Figures 3.10-3.14).

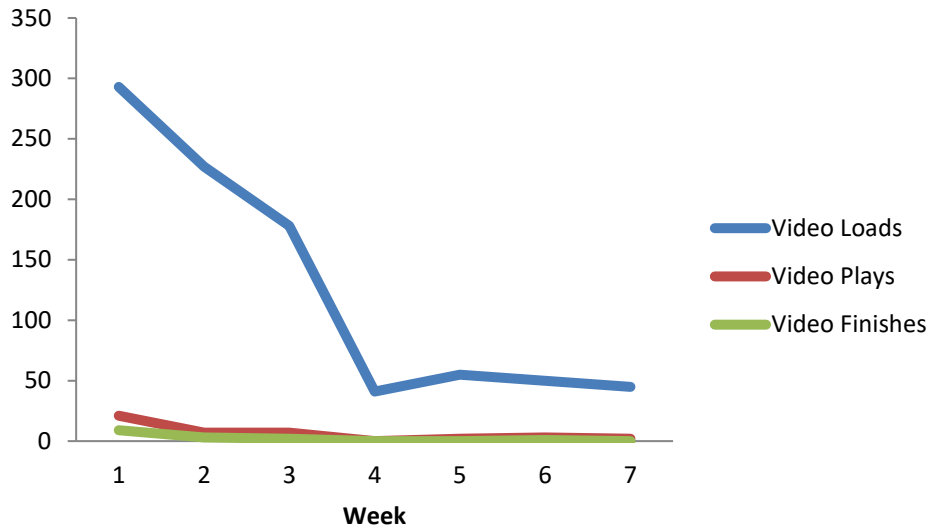


Figure 3.10. Engagement with video titled *Introduction* (supporting the first learning task).

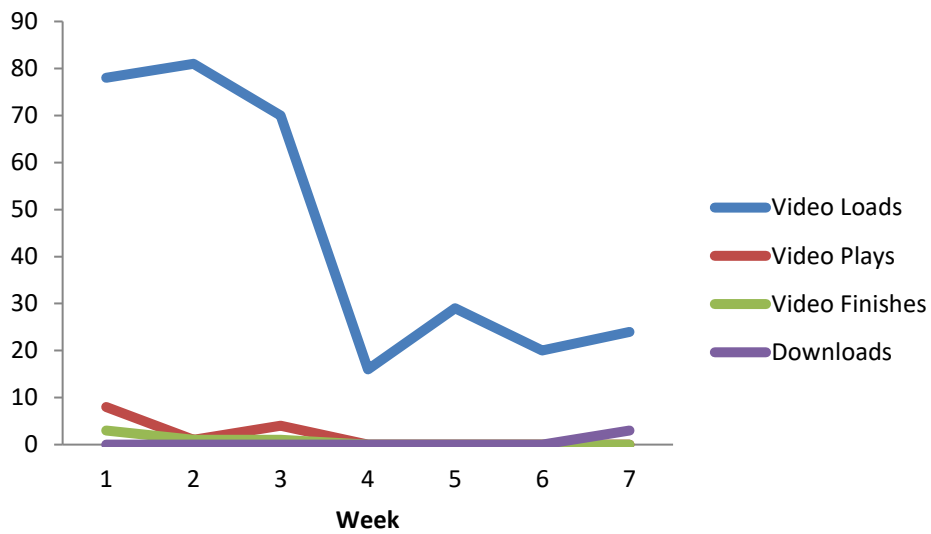


Figure 3.11. Engagement with video tutorial titled *Searching the Directory of Open Access Journals* (also supporting the first learning task).



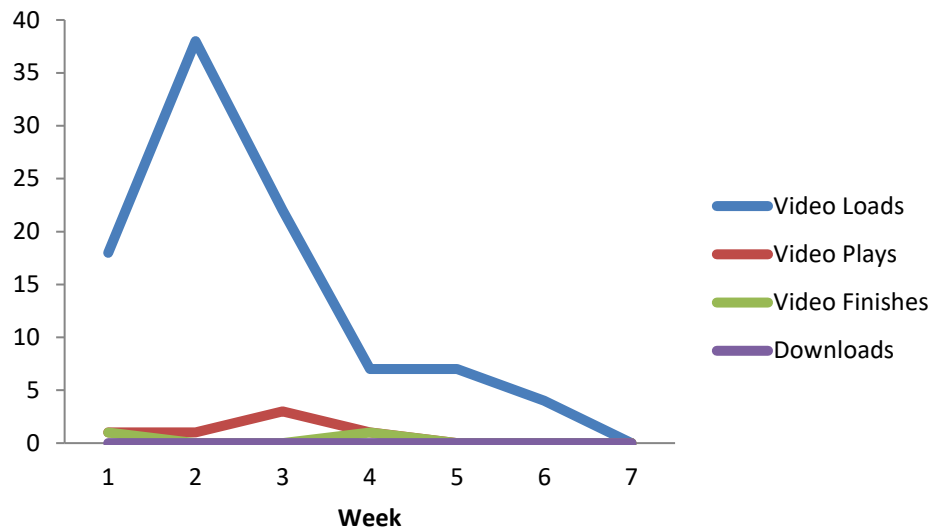


Figure 3.12. Engagement with video titled *Context Evaluation* (supporting second learning task).

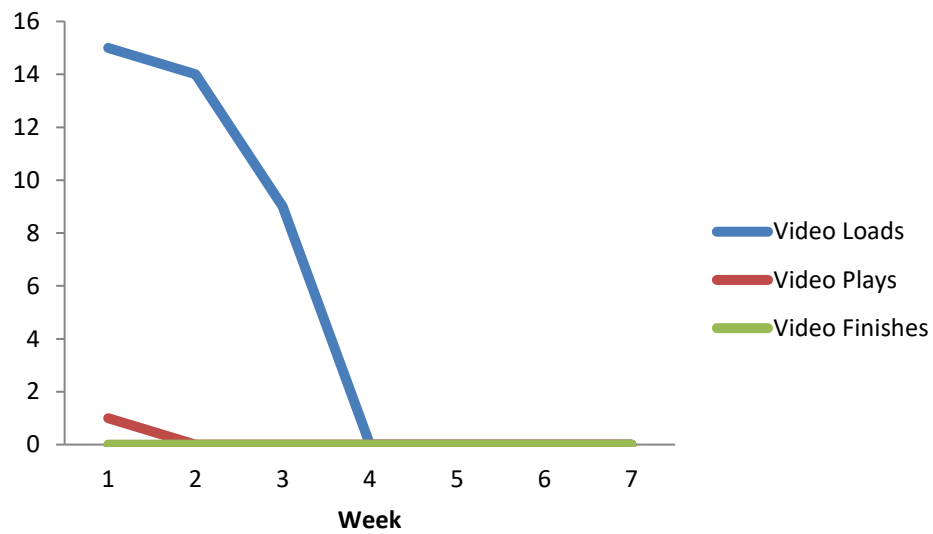


Figure 3.13. Engagement with video titled *Psychological Influences on Performance* (supporting third learning task).

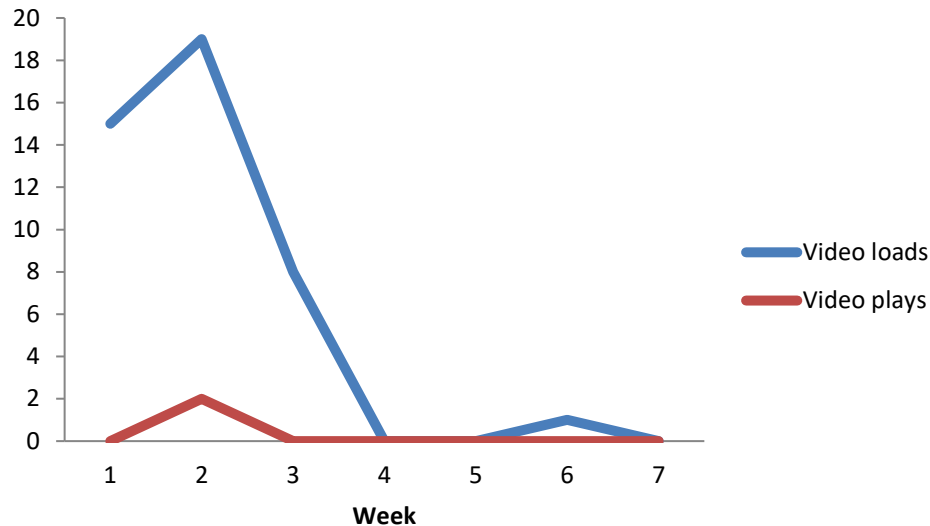


Figure 3.14. Engagement with video titled *Performance Enhancement Strategies* (supporting fourth and final learning task).

**Engagement through WikiEducator.** On reviewing the course on the WikiEducator website, it was possible to obtain the following supplementary information on course engagement:

- 51 learners enrolled on the course, this was roughly a third of the number of the total users recorded by Google Analytics, suggesting that most users who visited did not actually register for the course.
- 20 WikiEducator notes were posted all introducing or welcoming learners (related to the first learning task).
- 10 learners shared a resource including personal analysis from an Open Access Journal in the resource bank (also related to the first learning task).
- One learner created content for the second learning task.
- Written submissions had a mean word count of 183 words, with a maximum of 275 words and a minimum of 62 words.
- There was no evidence of any engagement with the third or fourth learning tasks.

## Discussion

The research question for the first study in the present research was *what patterns of online activity emerged from the first iteration of the open online course and how can this information support the design of a second iteration?* The web analytic data collected during the course, when viewed collectively, builds a picture of declining activity and limited engagement. Engagement was sporadic, with a dramatic reduction in online behaviour within two weeks of course commencement. Indeed, it would be fair to summarise that there was only small pockets of learning activity, but in general the first iteration of *Elite Sport Performance: Psychological Perspectives* was not a great success in terms of sustained engagement. A large proportion of online activity recorded did not result in any further engagement with the course at all, and there is reason to surmise that most visits to the site were short and even when registration occurred, subsequent engagement did not follow.

**Intention to take the course.** Google Analytics recorded 151 users in 389 online sessions during the lifespan of the course. Meanwhile, the WikiEducator platform recorded that 51 participants registered and enrolled on the course. Furthermore, there were only 20 microblog posts and 11 incidents of sharing resources, all occurring at the early stages of the course. This data points to a lack of intention to fully engage with the course from most visitors to the website. This information when taken as a whole suggests that most users who viewed course content were either unable to or had no intention of registering.

It worth noting that all content was completely open to the world meaning that anybody could access course materials without having to enroll or login to the course, and therefore many users may simply have wanted to browse the content. Given that the bounce rate was within acceptable levels, particularly in the early

stages of the course, a possible insight is that a large proportion of users scanned course content and possibly decided it did not suit their interest or that they could not commit the time. A clear example of this phenomenon is illustrated by data relating geographic and acquisition data. A cohort of 56 users from Japan accounted for 62 sessions, most likely by clicking on a link from the Japanese Society of Sport Psychology. The activity of these users produced an average of just 1.5 pageviews per session and a mean session time of only 26 seconds. In this particular example it would seem reasonable to deduce that the course was not suitable and they lacked any intention to go any further. Although this is an extreme example given the likely language context, it is probable that this was a common issue given how few users registered for the course.

**Persistence and sustained engagement.** The data also suggests that a core set of learners (perhaps no more than 15 individuals) did engage in the early stages of the course, offering both commitment and effort, but ultimately all dropped out. It would seem that those learners either lost interest in the course after that time or did not feel competent to proceed. The specific learning task around the second week (Task 2) required learners to explore and evaluate content from open online journals and add this information to the resource bank. Without further investigation it is only possible to speculate on the reason, but a viable explanation is that the information to support the learning task was not adequate. It was also apparent however, that many users did not watch the supporting videos that may have helped them understand the learning activities more effectively. Vimeo data provided particularly useful insights into understanding engagement because in watching a video, the user must decide to play it and commit both attention and time.

**Issues of design.** The web analytic data pointed towards a misalignment between the course design, learner needs and expectations, and subsequent engagement. In addition to problems in accessing supporting information, it is likely that there were some issues with the usability of the chosen learning platform. As indicated previously, the course was built using a wiki and it can be posited that this particular web technology is not a natural fit for the presentation of learning activities; a wiki's general function is for the co-construction of knowledge by groups of authors (see Wikipedia for example).

From both a functional and aesthetic perspective the interface was cluttered and it is not unreasonable to propose that this undermined the user's sense of competence in the likely confusion of navigating through the course. Furthermore, on visiting the course website for the first time, it was not a prerequisite to register before being able to view content, meaning that the user could not be sure if they had joined the course. If the user did actually register, they did not receive an email or feedback from the system to tell them that they actually had registered and could therefore move forward. Moreover, if the user did engage with the course content and carried out learning tasks, the interface offered limited feedback and no sense of progression. Meanwhile, the left hand menu contained numerous links not directly related to the course, which fundamentally undermined usability by making it more difficult to negotiate a path through the course.

The evaluation of the first iteration of *Elite Sport Performance: Psychological Perspectives* should be interpreted with an understanding of the limitations of web analytic tools. Web analytics provide both macro and granular level insights into online activity, although as Fagan (2014) acknowledges, inferences about online behaviour should be considered cautiously in the absence of

other supporting data. The design issues posited above should therefore be understood within the boundaries of such limitations, and future evaluations such as the one described in Chapter 5, should include more diverse measures to sit adjacent to web analytic data.

**The wider context.** The evaluation of this course should be seen in the wider context of open online courses, where sustaining engagement is a common problem. In an exploratory study, Jordan (2014) aggregated enrolment data from 91 MOOCs and found that average completion rates to be less than 10%. Meanwhile, Reich (2014), in a survey of 79,525 MOOC participants across eight HarvardX courses, found a range of intentions to participate in a course, from simply browsing course content to obtaining a completion certificate. It should be emphasised that the barrier to access is low in that the course costs the individual nothing in terms of financial commitment and only an Internet connection and time is required. Therefore given the context, greater care is required in the design process to optimise the experience, in modelling continuance intentions, and building and sustaining motivation through closer examination of needs.

**Taking a self-determination theory perspective.** Through the lens of self-determination theory it is possible to account for some of the issues apparent in this course in terms of needs satisfaction. These problems can be conceptualised around how certain aspects of the design did not sufficiently support the basic psychological needs of competence, relatedness, and autonomy, which are central to facilitating intrinsic motivation and therefore subsequent engagement.

**Competence.** In reviewing the content for first iteration of *Elite Sport Performance: Psychological Perspectives*, there was plenty of evidence of learning activities that provided opportunities to demonstrate competence. In the first learning

task, 10 learners provided on average approximately 200 words of insight and analysis of journal articles, demonstrating a certain degree of energy and commitment to learning. Whether this activity and others were beyond the perceived competence of many others who initially showed interest in the course can only be speculated upon. However, this course was marketed as foundational, yet required learners to view open access research journals from the earliest stages, a task that would require strong academic literacy. By the time the few learners that were engaged in the course reached the second task, many dropped away, and again although the exact reasons can only be speculated upon, it is very possible that the learners did not feel competent to proceed.

Difficulties in using the course interface may equally have had an undermining effect on competence. If learners are unsure whether they have registered or not, or unable to navigate through content, or the interface does not provide a sense of progression, then perceived competence will be diminished. Indeed, if the learner does not feel competent in using the interface, then it is reasonable to assume that they are unlikely to feel optimised towards learning. Usability research has demonstrated that when users are presented with interfaces that are difficult to use, or require cognition that could be better used elsewhere, most give up on the task (Ceaparu, Lazar, Bessiere, Robinson, & Shneiderman, 2004). A commonly used mantra coined by usability expert Steve Krug (2006) is “Don’t Make Me Think” (p.11), and this rings true in the example of this course. Using the interface should never get in the way of actually doing tasks that the user wishes to achieve, but it is very possible that this is exactly what happened in *Elite Sport Performance: Psychological Perspectives*. As an aside, usability issues with

the WikiEducator platform has been identified by other researchers (see Singer & Porter, 2015), and it is understood are now being attended to by the OERu.

The role of competence enhancing feedback is also important in building levels of competence. There is evidence to suggest that limited feedback mechanisms were in place in this particular course. Feedback that is informational and structured can help to build competence and has an additive role in facilitating intrinsic motivation (Hagger, Koch, & Chatzisarantis, 2015). Although there are inherent issues to overcome in providing relevant and timely feedback in an online environment, it is an issue that requires attention in the design.

***Relatedness.*** It has been demonstrated that satisfying the need for relatedness provides a supporting role in facilitating intrinsic motivation (Deci & Ryan, 1985b), as well as enhancing daily well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). In *Elite Sport Performance: Psychological Perspectives* there were many examples of a warm and friendly style, and therefore if salient to the user provided relatedness support. However, such communication was more evident in the microblog area of the course, whereas other content was quite functional.

Ongoing communication during the course was limited; for example there was no evidence of a course facilitator regularly communicating with learners and attending to any problems that they may be having. Additionally, a course facilitator embedded in the course could weave discussion or provide a single point of contact to assist with questions and problems. This role, if implemented effectively, can support all three basic psychological needs and foster intrinsic motivation. In addition to attending to relatedness needs, the offering of feedback to learners, answering questions, providing clarification, etc., can assist in building learner competence.



Finally, the design does not seem to take an internal frame of reference (Rogers, 1957), in which the individual context of the user is understood and empathised, something that is vital to relatedness. When designing an online environment, this is not something that is easy to achieve, particularly when there is limited information about the users. However, it is possible in the design process take a more empathic approach and try to better understand the likely experience of using a technology. More specifically, there are a number of user-centred design techniques that could have been deployed in the design of the course, which may have mitigated some of the issues presented.

**Autonomy.** Autonomy, that is acting with volition, agency, and self-endorsement lies at the heart of self-determination theory and is a vital ingredient in fostering intrinsic motivation. Without autonomy, behaviours cannot be truly self-determined and therefore are more likely to lead to negative outcomes, which in the context of education is a loss of persistence or lack of enjoyment. In an open online course, where many factors found in traditional learning are not present and learners are self-directed, a strong argument can be made that autonomy support is vital to its success.

Practically supporting autonomy places an emphasis on facilitating internally driven processes such as enjoyment, volition, and choice coupled with limiting external contingencies or pressures that may increase the chances of learner drop out. In the example of *Elite Sport Performance: Psychological Perspectives*, the most salient pressure was time. In a context in which the learners will most likely fit the course into other aspects of their life, a 40 hour course to be completed in 6 weeks was ambitious, particularly when four learning tasks made up of many steps had to be finished in that time.

Meaningful choice is regarded as an important mechanism within self-determination theory for building autonomy as it provides opportunities to explore informational aspects of the environment that feel personally relevant to the individual. Within the first iteration of *Elite Sport Performance: Psychological Perspectives*, there were examples of choice, for example in choosing journal articles that were relevant to the sporting interests of the learner. However, whether this aspect of the design could have been made more central to the learner experience is something worth considering.

In addition to meaningful choice, having quality supporting information and clear structure is also a necessity in supporting autonomy (and indeed competence). In the context of this course, structure refers to providing a navigable pathway through the course with relevant information along the way. This guiding environment facilitates the internalisation of concepts and ideas, remembering that the process of internalisation is a key feature of integration and autonomous functioning. (Deci & Ryan, 2000; Ryan & Deci, 2017). In the absence of structure there is chaos, consequently making it difficult for the learner to make meaningful sense of their learning environment and therefore progress in an autonomous fashion. Although the pedagogy of discovery (Taylor & Mackintosh, 2011) through which learners find, critique, and create open educational resources is an innovative approach, perhaps structure and informational support was not optimised to meet autonomy needs in the example of this course.

**Looking forward.** The first iteration of *Elite Sport Performance: Psychological Perspectives* was an innovative course both in terms of educational design and content. Having evaluated the course mainly through web analytic data, it can be asserted that it had design deficiencies that limited engagement. Self-

determination theory provides a useful lens through which some of these design limitations can be accounted. Specifically, aspects of the design did not support the basic psychological needs of autonomy, competence, and relatedness, which are central to intrinsic and other forms of autonomous motivation.

The decline in activity in this study concurs with evidence from other research into open online courses (e.g., Jordan 2015; Xiong et al., 2015), which Clow (2013) describes as “the funnel of participation” (p.186). The drop in general engagement over time is possibly a natural phenomenon of open online education given its context, although investigating a new profile of learners who sign up for a new version of this open online courses will help to provide some illumination on the subject. Therefore, following the redesign of the course in Study 2 and its subsequent launch, Study 3 will collect demographic data (e.g., age, sex, educational background), intentional data, motivational orientations as described in causality orientations theory (Deci & Ryan, 1985a), basic psychological needs satisfaction, and finally measures of engagement. A continuance intention measure will incorporate four items identified by Reich (2014) in an analysis of completion and retention rates of massive open online courses.

The next chapter describes Study 2 and provides a granular account of the steps taken to design a new version of the course from first principles to launch. More specifically, the design process will heavily draw on the application of self-determination theory and its focus on the satisfaction of basic psychological needs to stimulate intrinsic motivation. Furthermore, design solutions offered through user-centred design will be deployed to help obtain a better understanding of potential learner contexts as well as address specified basic psychological needs.

#### **Chapter 4: Study 2 – A Redesign of *Elite Sport Performance: Psychological Perspectives* through the Application of Self-Determination Theory Principles**

Study 1 in the present research described an evaluation of the first iteration of an open online course titled *Elite Sport Performance: Psychological Perspectives*. The findings, derived mainly from web analytics, provided evidence of limited and sporadic engagement with the course. Despite the fact that it was the world's first open online course on the psychology of elite sport performance, the analytic data indicated that some aspects of the course design might have undermined overall engagement. More specifically, when viewed through the lens of self-determination theory (Deci & Ryan, 2000) a non-optimal interface coupled with under-structured learning activities may have undermined a perceived sense of competence for many learners.

The findings of Study 1 coupled with the relevant literature presented in Chapter 2, illustrated that the development of a successful open online course where learners may drop out at any point, is complex and challenging. Study 2 will describe in detail the steps taken to design a second iteration of *Elite Sport Performance: Psychological Perspectives*, which uses self-determination theory to guide development, and utilises best practice design techniques. In particular, it will address the following research question: *What design features should be considered when building an open online course that focuses on supporting learner autonomy, competence, and relatedness?* To approach this research question, the open online course was redeveloped from first principles given that the previous iteration was unsatisfactory and required a radical redesign. More specifically, the course was built from the ground up, focusing not only on visual and interface design of the course, but also on creating brand new content and optimising the experience of taking the course. In particular, the support for the basic psychological needs of

autonomy, competence, and relatedness to foster intrinsic motivation provided a focal point for the design. It was anticipated that the interventions made in Study 2 would allow the course to perform better than its first iteration due to a stronger design approach. In following, Chapter 5 will present a third and final study with evaluation findings from a four-month deployment of the course.

### **Theoretical Framework and Principles of Design**

The present research has consistently made the argument that open online courses cannot be considered in the same light as traditional courses. A number of assumptions based on this premise have therefore been made about the nature of open online courses, which in addition to the findings from the first study inform the choice of theoretical framework and subsequent design principles.

A first assumption is that open education is a unique educational context in that the barrier to access is low, and because there is no financial investment on the part of the learner, the monetary cost for dropping out of an open online course is zero. This can be contrasted with traditional approaches where the learner will often incur a financial penalty if they drop out of an enrolled course, which may act as an extrinsic motivator to continue. Other incentives to complete a course are often not present such as formally recognised or accredited qualifications. A number of MOOC providers, including Coursera, are beginning to speculate in this space where learners may pay to be accredited, although this approach can only be described as nascent with formal recognition of these qualifications unclear in other contexts.

A second assumption is that the decision to sign up for an open online course is purely volitional. A potential learner will most likely make the choice on whether to sign up for a course independent of pressure from other agents. For a traditional course offered by universities there may be psychological pressures placed on the

student by parents or friends to enrol. Other external motivators such as likely future earnings or long term career prospects do not come into play in open education, although there is some evidence to suggest this may change (see for example Murgatroyd & Tully, 2015).

A third assumption is that due to the relatively low barrier to access (a simple registration process, for example), potential learners will make quick judgements on whether to continue with a course. Possible scenarios for not proceeding include that the learner decides that the content of the course does not meet their expectations, or a quality judgement is made based on the visual design or ease of use of the interface, or simply that other time pressures get in the way. The first study pointed to this assumption, with both a high bounce rate on the course website and a dramatic drop off in activity over time. As a footnote, the contributors to non-participation will be examined further in Study 3.

A final assumption follows on directly from the considerations mentioned above, in that dropping out is a normative event in open online education (see Jordan, 2015 for an overview of attrition rates), and therefore success metrics may need to shift accordingly. It is not reasonable for withdrawal rates to be benchmarked against traditional courses, although it would be reasonable for designers to compare with earlier iterations to examine if any improvements have been made.

For this study, self-determination theory provides a useful theoretical framework to guide the course design for a number of reasons. The decision to engage or not with a free and open online course is a volitional one, where some controlling factors more commonly associated with traditional learning environments are not present. With a strong emphasis on basic psychological needs satisfaction to foster intrinsic motivation, the theory is particularly relevant in this open context

where sustained engagement will be dependent on facilitating autonomous learning. Thus in terms of design, a valid question is not “How can learners be motivated in this open online course?” but rather “How can the open online learning environment be optimised so that learners are self-motivated?” In light of these considerations, a design framework based on facilitating intrinsic motivation to drive learner engagement is proposed in Figure 4.1 and detailed below.

Particular emphasis on the basic psychological need of autonomy was made in the design framework. A number of studies have offered evidence in support of the notion that autonomous learning can positively predict learner engagement (see Reeve, 2012 for a review of the research). In the unique context of open education where the barrier to access is low, but equally the decision to engage or not have no material implications, supporting autonomy may be paramount. More specifically, any engagement with course content or learning activities will ultimately need to emanate from the self and be self-endorsed to be sustained in this context. In practical terms, this means that the course design aimed to create a learning environment that allow the learner to feel in control of their own learning, work at their own pace, and provide a degree of choice in what learning tasks with which they wish to engage.

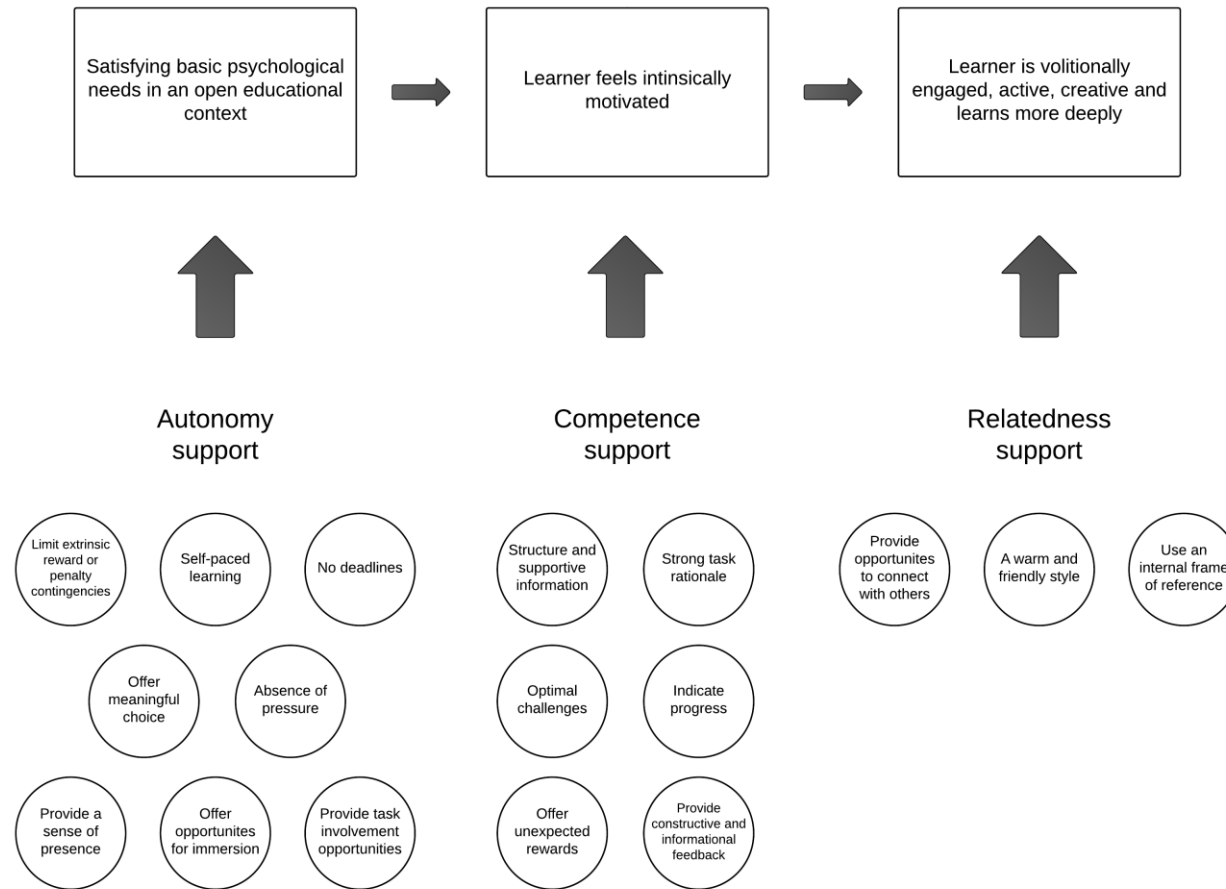


Figure 4.1. Proposed design framework using self-determination theory principles to foster intrinsic motivation and drive engagement.



The basic psychological needs of competence and relatedness must also be satisfied as learners make progress through the course. A key design aim was to facilitate growth in perceived sense of competence in the understanding and application of psychological strategies used in elite sport. The design also supports relatedness by encouraging interaction between course participants, having a warm and empathetic approach in course communication with others, and providing points of contact so as to diminish the impersonal nature of online learning environments. In the next section, the design principles that support autonomy, competence, and relatedness will be examined in greater detail. These principles are derived from empirical evidence offered within self-determination theory across a number of life domains (Deci & Ryan, 2008a) and have been tailored to this unique context of an open online course in the psychology of elite sport performance.

**Supporting autonomy.** This design approach places a practical emphasis on facilitating internally driven and self-congruent processes such as interest, enjoyment, volition, and choice coupled with limiting external contingencies or pressures that may increase the chances of learner drop out.

**Meaningful choice.** Having meaningful choice is central to autonomous learning (Murphy, 2012). In the example of *Elite Sport Performance: Psychological Perspectives*, an important design feature is to offer a range of learning activities where learners can choose to engage with different tasks depending on their own interests or personal context. Through offering choices, the learner can navigate their own pathway through the content, utilising the information that is both meaningful and helpful to them. In this course for example, a learner may choose to focus on a particular psychological intervention or skill that they feel may help them personally or an athlete with whom they work.

*Self-paced learning with no weekly deadlines.* Echoing the meaningful choice approach, and recognising that informal learning within an open online course must be integrated with other aspects of people's lives, the course is designed to be taken at a pace that suits the learner. This approach is different from many other open courses, where the course runs for a fixed period with particular activities expected to be completed within a particular week. However it can be argued that the imposition of deadlines runs the risk of creating external pressure, thereby undermining learner intrinsic motivation (Amabile et al., 1976) and increasing the risk of withdrawal when they fall behind. Self-determination theory recommends that deadlines should only be used when absolutely necessary, and the deadline should be accompanied with a strong and identifiable rationale. This course was designed to remain open for a minimum of 4 months giving the learner ample time to complete the course, but also "leap ahead" if they wished to work within a specific time period more suitable to their needs. The closing of the course after 4 months did however present an artificial deadline for the practical reason that the research data needed to be collected and this information required explanation to the learners from the beginning. Additionally, there was an intention that the course would be reopened once the evaluation work had been completed so that those who were unable to finish the course would have the opportunity to continue.

*Limiting task imposition and contingencies.* The design of this course aimed to avoid imposing tasks on learners. This is not to say that goals were not set, indeed the course had a final objective of creating a mental training program for an hypothetical elite athlete. However as described previously, a design aim was that all tasks were optional with emphasis placed on offering a range of activities that the learner could elect to engage with or not based on their own preferences and

interests. Furthermore, all tasks would have appropriate supporting information, a clear purpose, and opportunities for self-reflection to consider a concept in relation to their own worldview and experience. The purpose of this approach recognises that learning within an open online course environment is less formal and lacks many of the regulations usually found in a traditional course. For example, a module in a standard undergraduate degree may run over a semester with compulsory specified learning tasks and assessments to be completed along the way.

Reward contingencies or penalties are often used in formal learning systems from early schooling to higher education, arguably in operant ways to obtain a desired effect. For example, if an undergraduate student hands in a late assignment he or she can expect to have marks taken off the final total. Although this approach acts as an extrinsic motivator to hand the work in on time and can be a powerful form of motivation, it also operates to undermine intrinsic motivation by placing a contingency on completion of the work. Such regulation may be necessary in formal education for a number of reasons (particularly student equity), it may be posited that contingencies are less likely to work in an open online context where the learner may simply drop out if they wish rather than take the negative consequences.

*Task involvement, immersion, and sense of presence.* Task involvement is strongly associated with autonomy and intrinsic motivation (Papaioannou, Theodosiou, Pashali, & Digelidis, 2012). When the learner is task involved, they are willingly undertaking an activity because of its inherent qualities, which may be optimally challenging, enjoyable, or even put them into a flow state (Csikszentmihalyi, 1991). Success or failure when undertaking the activity provides no contingency that could affect their self-esteem, self-identity, or status within a group and thereby undermine their autonomy needs. This can be contrasted with ego

involvement where success or failure may boost or undermine self-esteem and therefore act as an internalised contingency. The absence of peer groups in open online learning reduces the chance of ego-involvement with learning tasks, and great care was taken in designing tasks in which learners could place their own values on their achievements. For example, a concentration grid task was developed to allow learners to see how many numbers they could find on a randomised grid in a minute, which they could repeat over and over again to try and better their previous score. No value was placed on their achievement, instead the explanation provided with the task illustrated how difficult it can be to shift attention from one thing to another in a pressurised context, and analogous to the conditions in sporting competition.

The concentration grid exercise is also an example of an immersive task. Immersion is associated with sense of presence in an environment whether real world or digital (Weinstein et al., 2009); the learner feels less distracted by external stimuli and can fully attend to the content being presented to them. Immersion is particularly important in digital environments (Ryan, Rigby, & Przybylski, 2006), and in this course the creation and utilisation of high quality sporting images and action-packed videos to provide an immersive experience was a priority. Immersion is associated with “a flow of psychological satisfactions” (Ryan & Deci, 2017, p. 520), particularly autonomy and competence. If optimally designed, the individual perceives that they are present in their mediated world and experience agency and success in the richest possible way. For example, a high quality video with exciting sporting action places them psychologically in that world, and for some the medium completely disappears as they are placed at the heart of the action (Lombard & Ditton, 1997). In the example of the present research, high quality sporting images that draw the eye or professionally produced videos that show the drama of elite

sport are designed to satisfy the need for autonomy and therefore facilitate intrinsic motivation.

**Supporting competence.** A perceived sense of competence is a second basic psychological need articulated in self-determination theory. In the context of this open online course, a key design goal was to facilitate “growing and experiencing challenge to one’s current ability and knowledge” (Baard, 2002, p.264). Therefore, the design features aimed to create an online learning environment, which in addition to developing knowledge of the psychology of elite sport, offered optimal challenges, and encouraged the development of and mastery of new skills that could be reused later in applied contexts.

***Supportive information, structure, and a clear task rationale.*** Providing relevant, timely, and supportive information is vital in facilitating competence. In this course this type of information included: (a) the course content itself divided into manageable blocks and written in an accessible web-friendly style; (b) information relevant to navigating the course content; (c) information pertinent to using the course interface; and (d) supporting information on how to approach a specific learning activity. The structured nature of the course, also allows learners to feel competent both in terms of orientation and navigation through the content. Additionally, where possible a clear rationale for each learning task was given so that learners could understand the inherent requirements of the activity. Further information regarding course content and activities will be described later in this chapter.

***Optimal challenge.*** Designing optimal challenge points (Guadagnoli & Lee, 2004) for a diverse set of learners from different parts of the world in an open online context is difficult to achieve, given that it is impossible to know individual baseline

knowledge or educational attainment. However, optimal challenges are an important ingredient in building a perceived sense of competence. The design of this course therefore aimed to *increase the chance* of learners being optimally challenged by: a) developing learner profiles (or personas) of potential course registrants to build a picture of likely registrants; (b) providing relevant information on whom this course is for and at what level it is pitched; and (c) provide opportunities to go further in their learning with different levels of challenge along the way and furthermore to encourage learners to set their own goals.

***Perceived sense of progression and recognition of success.*** A sense of progression through completion of tasks can also build levels of competence via information provided through the interface, such as a progress bar, motivational messaging, and course communications that recognise success.

***Offer unexpected rewards.*** Unexpected rewards are rewards that are unknown to an individual when they initiate and engage with an activity (Lepper, Greene, & Nisbett, 1973). Self-determination research has provided strong evidence to indicate that expected rewards undermine intrinsic motivation as supported by the definitive Deci et al. (1999) meta-analysis (described in Chapter 2). The same meta-analysis demonstrated that unexpected rewards do not have a direct effect on intrinsic motivation, but arguably can enhance enjoyment and therefore intrinsic motivation (Tang & Hall, 1995), depending on the perceived functional significance of the reward. In an online course context, an unexpected reward could be a learner of the week award, for example.

***Emphasis on positive and constructive feedback.*** The provision of feedback, which is constructive and informational in its content, is an important feature of the course design in terms of building perceived levels of competence. Close attention

was given to the tone and voice of course communication through which learners would feel that their contributions to the course would be greeted positively and therefore build rather than undermine their sense of personal efficacy. Feedback that not only is positive and encouraging, but also provides useful information that will help in the understanding of how improvements can be made can support competence.

**Supporting relatedness.** The third basic psychological need articulated in self-determination theory is relatedness. Given that the course is online and open to people from all over the world, this is possibly the most challenging basic psychological need to address, particularly because the social dynamics of relatedness are complex and because there was no direct access to course participants ahead of its launch.

*Provide opportunities to connect with others.* The provision of a course forum provides a platform for learners to connect with each other, to share ideas, experiences, opinions and personal insight, and to co-construct knowledge. In addition it was decided to employ a course facilitator to respond to discussions and weave themes together. Contact with the course development team was also integrated into the design either by responding to particular requests in the course forum, or via comment boxes or email.

*Warm interactions and friendly style.* As indicated earlier when considering competence, the tone of language (or voice) is an important feature of the course design. Feedback to learners, the language style of course content, and responses to questions should be warm, respectful, and authentic. Also, as described in more detail later in this chapter, the content should balance authority and expertise with a warm and equitable tone that is both inclusive and encouraging. Finally, moderators

were provided with guidelines from the course development team that encouraged other learners to be respectful and warm in their interaction with others.

*Taking an internal frame of reference of others.* Self-determination theory places an emphasis on having an empathic approach to communication and support (Vansteenkiste et al., 2010). Attempting to understand an individual's internal frame of reference, or to put colloquially "standing in somebody else's shoes" can be achieved by offering concern and appreciation of personal contexts and backgrounds. Furthermore, accurate empathy is likely to energise individual autonomy and competence as represented by feelings of freedom to make choices or to act upon pertinent information.

A specific design challenge for *Elite Sport Performance: Psychological Perspectives* is that in order to support relatedness through empathy, one needs to understand the internal frame of reference of a diverse set of people (as opposed to a single individual). A useful starting point is to remember that all learners who choose to engage with the course will be doing so voluntarily in their own time as opposed to within a more formal context. Second, there are some design approaches that can help in empathising with possible learners. These will be described in more detail later, but include: a) the creation of personas to provide a rich profile of possible users in terms of better understanding background, interests, and contexts; b) usability testing to better understand perceptions and possible frustrations when interacting with the course; and c) a warm and caring communication style, as indicated earlier.

### **Design Approaches**

Two design approaches, user-centred design (Norman & Draper, 1986) and authentic learning design (Herrington & Oliver, 2000; Herrington, Reeves, & Oliver,



2010), were drawn upon to help build an open online learning environment to support intrinsic motivation and subsequent course engagement. Modern techniques within user-centred design, often described by professional designers as user experience (UX) techniques were employed. Equally, an authentic learning approach was implemented via the real world applied techniques described in the course. Finally, these approaches were chosen because they provided useful tools and techniques to achieve some of the conditions that have been shown empirically to support basic psychological needs.

**User-centred design and UX.** Web analytic data presented in Study 1 provided evidence to suggest that the WikiEducator tool was not an optimal choice for a learning platform. This notion has been reinforced in an OERu review paper presented by Singer and Porter (2015) in which it was argued that WikiEducator does not provide an adequate user experience. In this iteration of the course, designing for a positive user experience when using the online learning platform was put at the heart of the technical development process. The creation of the open learning platform borrowed heavily from strategies and approaches used in professional web design with a strong focus on user-centred design and specific UX design techniques. Best practice approaches were taken from recommendations offered through reputable leading professional web development sites such as Alistapart (<http://www.alistapart>), expert usability services such as Nielsen Norman Group (<http://www.nngroup.com>), technical guidebooks, and the academic literature. The design steps taken are described in detail later in this chapter.

**Authentic learning approaches.** Authentic learning is broadly an educational design approach that places an emphasis on real world scenarios and problems (Lombardi, 2007). In the context of this course, authentic learning places a

sharp focus on understanding psychological phenomena in elite sport and applying interventions used by professionally trained sport psychologists working with athletes. These strategies and interventions can be made of practical use, which in the example of *Elite Sport Performance: Psychological Perspectives* may include incorporating psychological techniques in coaching or competitive sporting contexts. In addition, learners are presented with authentic scenarios that they can reflect upon from their own experiences (e.g., “have you ever used token rewards?”), or to consider their own insights into the psychological dynamics observed during a sporting event (e.g., Brazil’s anxious approach to the 2014 World Cup).

The role of the expert passing on and sharing knowledge is another important facet of authentic learning. More specifically, the learner has access to models of expertise (Herrington & Kervin, 2007), both from the course convenor (with over 30 years of professional experience), and professional sport psychologists around the world embedded into the course through their personal expert insights and written chapters from the open textbook *Secrets of Asian Sport Psychology*. The provision of online forums allows for questions to be answered by the course convenor and for other learners to demonstrate their own expertise in a relevant sport.

When taking a self-determination theory perspective, authentic learning design has the capacity to foster a perceived sense of competence through its use of real world tasks and scenarios (Martens, Bastiaens, & Kirschner, 2007). Over time the scenarios may become a little more complex and challenging, whilst remaining within a range of competence to suit different learners. The basic psychological need of autonomy is also addressed in authentic learning design in that learners are encouraged to identify their own ways of problem solving the psychological challenges put before them (Herrington, Reeves, & Oliver, 2014). Moreover, there is

generally more than one way to approach a problem presented to them or to put it another way, there is never a definitive right or wrong answer. Finally, relatedness is perhaps indirectly supported through learning tasks that involve sharing of ideas, experiences, and insights (Lebow, 1993; Oliver & Herrington, 2003).

### **Method**

Having established a theoretical framework for the course design and identified two design approaches to be drawn upon, the course development process commenced in earnest. The design of *Elite Sport Performance: Psychological Perspectives* was both fluid and iterative, which whilst using best practice techniques, also drew upon personal expertise, experiential knowledge, and aesthetic judgements. The course design process allowed for the creation an introductory course that would provide participants with a taste of how sport psychology is utilised in elite sporting settings.

The time period from design initiation to launch ran from March to October 2015 and took an estimated 700 hours in total. Figure 4.2 provides a summary of the design steps taken from initiation to launch. The process of design was essentially divided into three phases, which to use a filmmaking analogy involved: (a) a *pre-production* phase in which target audiences, course structure, and learning platform were identified; (b) a *production* phase in which content and design elements were developed; and (c) a *post-production* phase in which the design was quality assured, optimised, and made ready for launch.

Each phase can further be divided into particular stages containing discreet tasks of work that needed to be achieved in order to progress the design. In all there were seven stages of design spanning initiation to launch that are illustrated in Figure 4.2. Special note should be made of Stage 4, which for clarity has been broken into

three separate areas of work, nominally: selecting content (Stage 4a), designing the online interface (Stage 4b), and designing learning tasks (Stage 4c). A number of work areas had certain dependencies and were also iterated upon based on design decisions and feedback. Iteration is indicated on the diagram by feedback arrows. The rest of this chapter will now describe each phase of design in detail, beginning with the pre-production phase, which concerned the initiation of the course design through identification of target audiences.

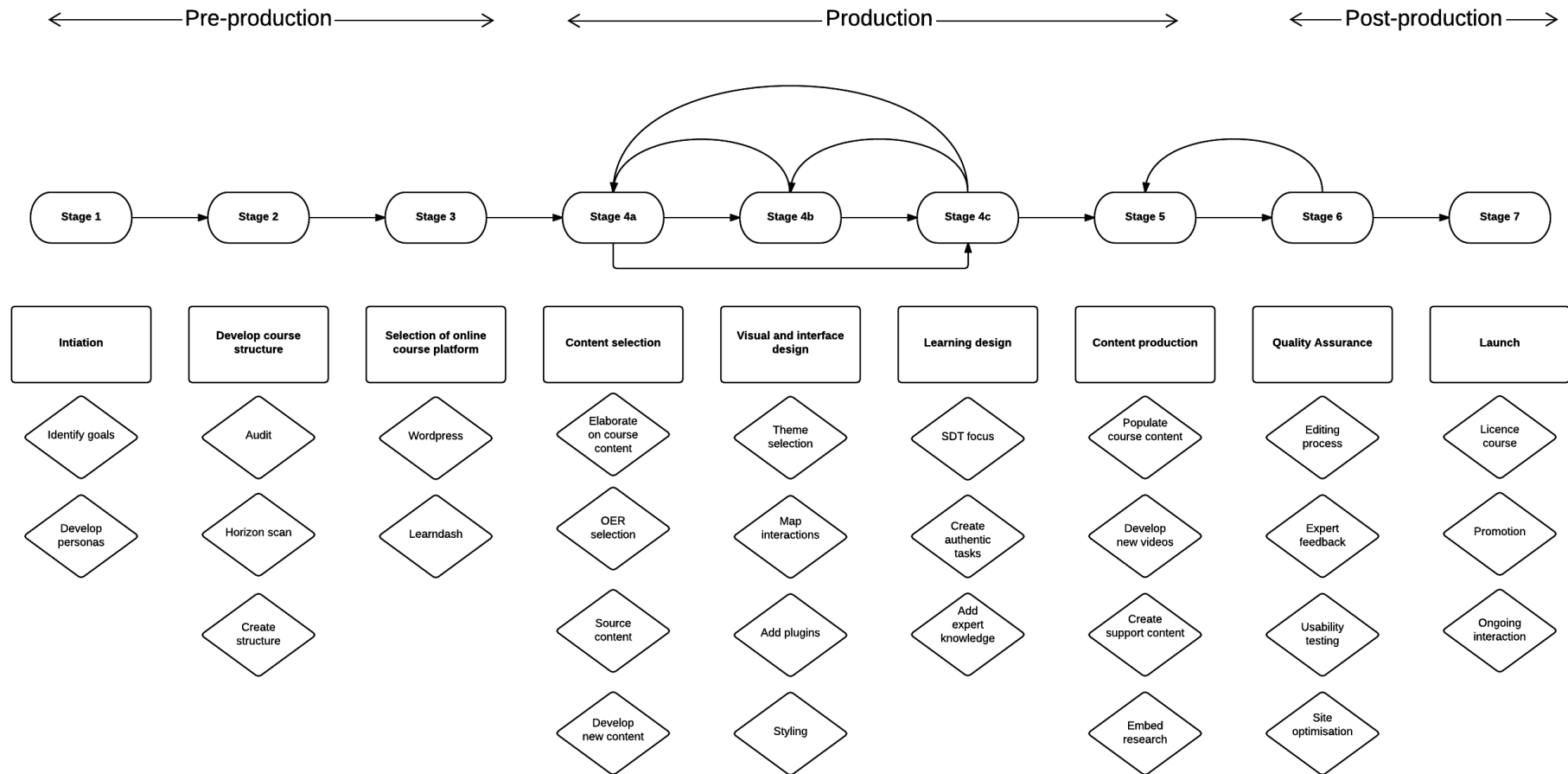


Figure 4.2. Summary of design steps in the production of the open online course *Elite Sport Performance: Psychological Perspectives*.

### **Pre-production Phase**

The pre-production phase laid the groundwork for the implementation of *Elite Sport Performance: Psychological Perspectives* and included:

- **Stage 1:** Initiation of the design project and articulation of prospective audience.
- **Stage 2:** Developing a course structure, including auditing the first course iteration for content that could be repurposed, horizon scanning other foundational level sport psychology courses, and mapping the course structure.
- **Stage 3:** Selecting and installing an online learning platform.

**Stage 1: Initiation.** The first stage of the design process was to identify the overall goals of the course and develop a clear understanding of the target audience. The goals of the course were closely associated with the theoretical framework described earlier in this chapter, which was to provide an experience that supported the basic psychological needs of autonomy, competence, and relatedness and therefore foster intrinsic motivation to drive engagement behaviours.

The first iteration of the course, which commenced at the end of 2013, provided limited but helpful insights into the likely audience for this new version. Information about participants was derived by perusing the course website on WikiEducator. More specifically, information was obtained by examining the first learning task, where course participants were asked to introduce themselves by posting a WikiEducator Note. For example, one learner wrote: “I was a baseball varsity player back in college. I coach little league baseball and do baseball programs. Hope to get some ideas and strategies on how to improve my players psychologically.” Building on these examples, it was decided to expand on the snippets of information given by previous course participants to create larger more detailed profiles called *personas*.

*Using personas to profile potential learners.* The development of fictional but realistic user personas is a technique commonly used by web professionals to represent models of users of a website. Their main purpose is to act as a point of reference throughout the design lifecycle (O'Connor, 2011) to illustrate the behaviours, attitudes, and motivations of a website user. Personas can be “brought out” at different points to help inform the design of the user experience and answer questions like: “What would Barry do here? What would he think? Is this going to work?” Evidence of personas being used to assist the development of MOOCs has recently emerged in the literature (e.g., Gilligan, Chen, Kelle, & Darzentas, 2015; Kelle, Henka, & Zimmermann, 2015). From a self-determination theory perspective, the creation of personas also offers the designer an opportunity to take the perspective of possible course participants, and thereby provide a vital technique in being both autonomy and relatedness supportive (Mageau & Vallerand, 2003). This is particularly important given there was no direct access to learners before the course was launched, so having personas to help take an internal frame of reference acted as a useful analogue.

Four personas were created to represent different user archetypes, which can be viewed in detail in Appendix A. The personas were a) a Malaysian badminton coach, aged 52, seeking sport psychology techniques to help with training; b) a Canadian basketball scholarship student, aged 19, seeking to complement his existing studies; c) a Hungarian sport psychology research student, aged 24, seeking to gain expert knowledge in topic areas in which she is less familiar; and d) an Australian retiree, aged 74, with a passion for sport. In each case, Internet searches were used to build authentic and believable profiles. For example, the Hungarian

student persona had a genuine female name based on popular Hungarian names and was studying at a real research school at an authentic Hungarian university.

Personas were constructed using best practice guidelines from Usability.gov, a United States government resource (“Personas,” n.d.). A predominant requirement for the development of the personas was to make them as realistic as possible and ensure that possible reasons for taking the course were articulated. Profile information was created for each persona to draw a rich and rounded character, and included: geographical location, demographics, job status and qualifications, spoken languages, professional profile and personality, and reasons for enrolling in the course. All personas were given to peers and colleagues to check that the content was both valid, accurate in terms of contextual information provided, and most importantly believable.

The technique has some limitations in that it is simply a creative tool with no predictive power. It should therefore be used cautiously with an understanding of its overall purpose to help articulate a potential user base rather than make assumptions. Personas should never be used as a replacement for input data from real users (Boag, 2013; Travis, 2015) and were used only as a point of reference to assist with design decisions. Additionally, robust quality assurance approaches, including usability testing and expert feedback were used in later design steps.

**Stage 2: Developing a course structure.** Having created four personas to help assist with the design process, the second step in the pre-production phase was to build a site structure that would map the course topic areas. Two supporting activities were undertaken to inform this process; first an audit of content from the first version of the course for suitability for reuse, and second a horizon scan of topic



areas offered through foundational courses from universities with strong reputations in disciplines related to sport psychology.

***Auditing content from first course iteration.*** The first iteration of *Elite Sport Performance: Psychological Perspectives* contained some relevant content that could be repurposed for the new iteration of the site, so a web content audit was undertaken. A web content audit is an established technique through which an inventory of content stored on a website can be identified and its present suitability reviewed (Spencer, 2014). It is seen as useful tool by many web design practitioners for both keeping track of content on large websites and in informing site redesigns.

Following the audit, most of the content was discarded (including most of the supporting text and video), which was considered to be no longer relevant to the new course. The full audit can be viewed in Appendix B, but in summary there were four pieces of content that were evaluated as useful:

1. A section titled *The Six Pillars of Elite Performance*, which was acknowledged to provide a useful contextual framework to understand elite performance.
2. Chapters from the open textbook *Secrets of Asian Sport Psychology* (Terry et al., 2014), which contains a wealth of applied expert knowledge for learners and from which many more chapters would be integrated into the new course.
3. The concept behind the final task, which was to ask course participants to build a mental training program based on their learning. This content would be reworked and is described in more detail later in this chapter.
4. A certificate of completion.

***Horizon scan of foundational sport psychology content.*** The term horizon scan has been adopted in the present research to mean a systematic search of topics contained within leading sport psychology courses and textbooks. The purpose of the

horizon scan was to find indicative data on the most common foundational topic areas of sport psychology with a view to informing the content of the new course.

Three sources were searched, these were: a) leading foundational level sport psychology textbooks ( $n = 7$ ); b) the top five ranked UK Complete University Guide Sport Science Courses for 2014-2015 ( $n = 5$ ); and c) the top five Times Higher Education World Ranked Australasian universities with ESSA accredited courses in exercise and sport science ( $n = 5$ ). The frequency of topic areas is shown in Figure 4.3. It can be seen that the five most common topics in this sample were in descending order: group dynamics ( $n = 12$ ), motivation ( $n = 11$ ), anxiety ( $n = 10$ ), self-confidence ( $n = 8$ ), and personality ( $n = 8$ ).

The range of topics was quite large, and therefore some areas were prioritised over others for consideration to become modules in a course that was anticipated to take a learner around 60-80 hours to complete. The four most common topic areas in the sample were all selected for the course, which were group dynamics, motivation, anxiety, and self-confidence. However, it was decided that the topic area of personality would not be included in the course because it would contain more theoretical content than applied psychological performance strategies, and therefore not fit into the applied nature of the course. Other topic areas that were chosen for the course were concentration ( $n = 5$ ), mood and emotion ( $n = 5$ ), and music ( $n = 2$ ).

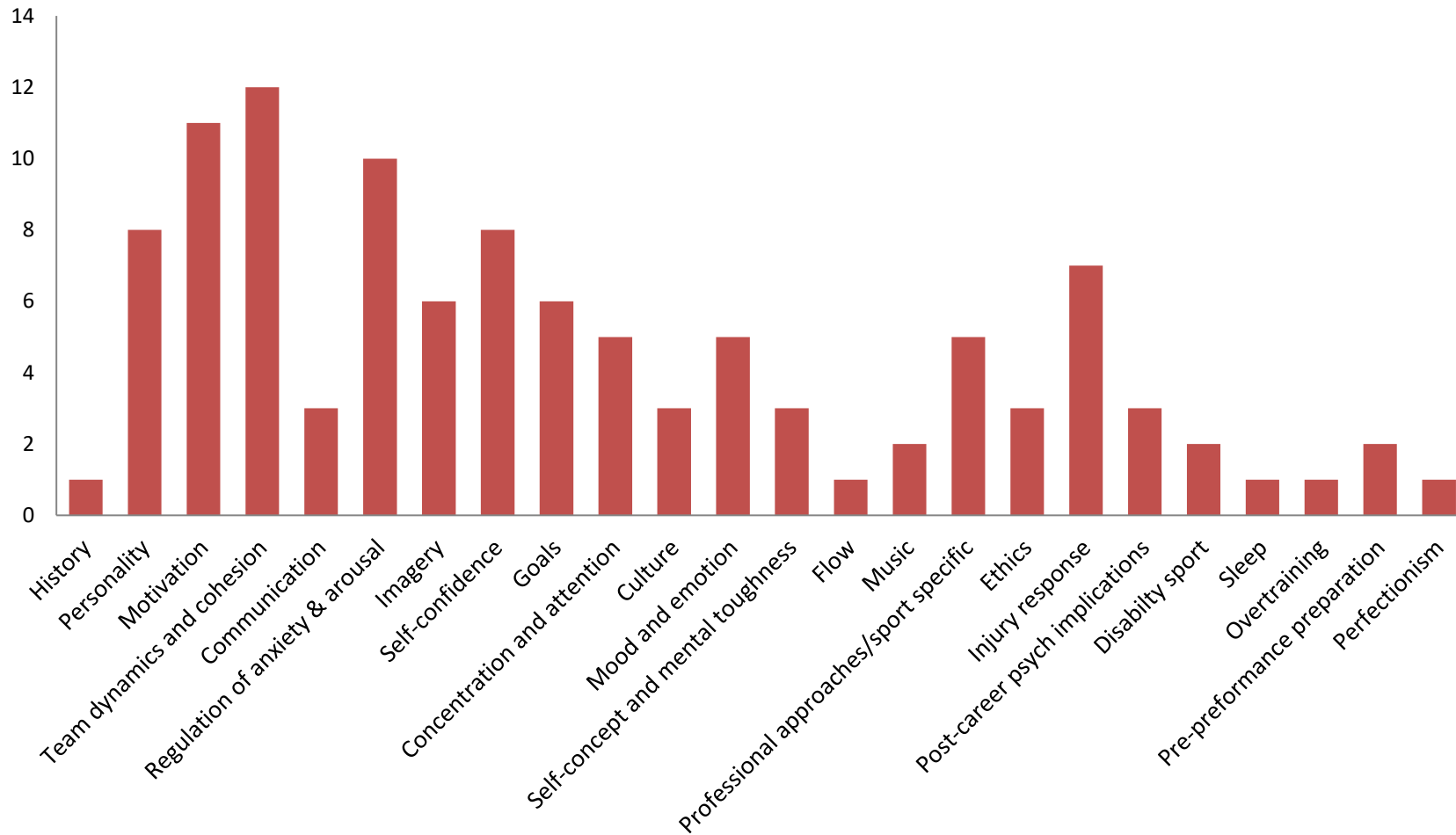


Figure 4.3. Frequency of topic areas found in foundational sport psychology courses and textbooks ( $N = 17$ ).

The mood and music topics were chosen because the course convenor is an internationally recognised expert in these areas and could therefore provide unique insights that would not be found anywhere else. Other more specialised topic areas including injury response ( $n = 7$ ) and sport specific approaches ( $n = 5$ ) were not chosen as standalone topics, in the knowledge that this content and others would be embedded into the course through expert chapters from the open course textbook *Secrets of Asian Sport Psychology* (Terry et al., 2014).

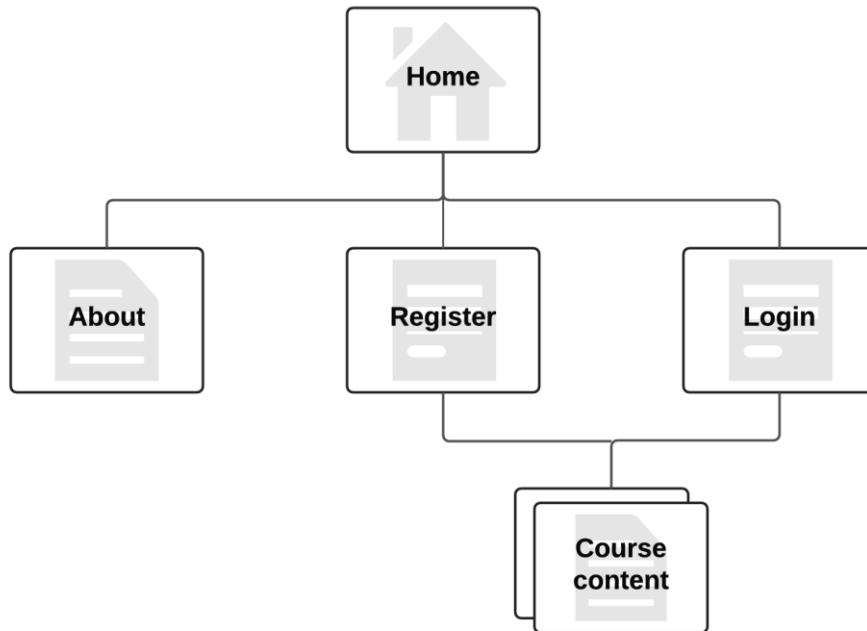
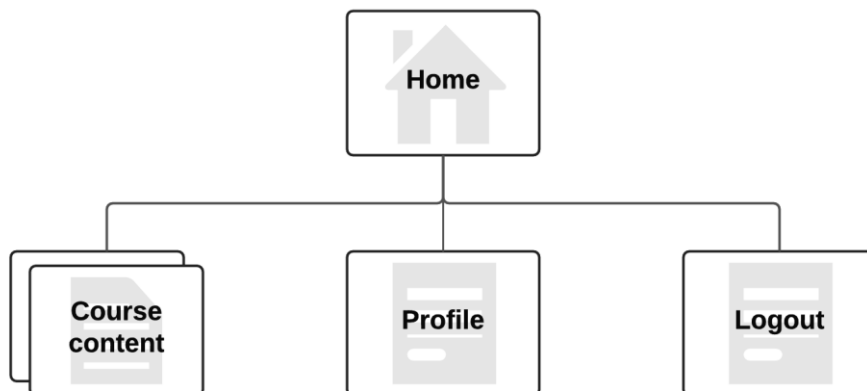
**Mapping the course structure.** The final task in Stage 2 of the design of *Elite Sport Performance: Psychological Perspectives* was to build a site structure. In any website development project, the design of a coherent site architecture is an integral step. An easily navigable website not only allows its users to get to relevant information as quickly as possible, but from a self-determination theory perspective, will contribute the basic psychological need of competence by offering a clear sense of structure and progression. Conversely, a confusing site architecture with too many choices, or opaque or poorly defined links will undermine user competence with the likely outcome that they leave the website (Pierce, 2015), and this possibility was previously considered in Study 1.

Two qualities for the website structure were identified that aimed to support learner competence in negotiating their way through the course website. Firstly, to build a structure that would make it simple to get to relevant course content in as few clicks as possible, and second to provide a clear navigation pathway through the course.

**Accessing course content efficiently.** Figure 4.4 presents a simplified overview of the course information hierarchy. It can be seen that structure presented is contextualised on whether the user is logged in or not. The first diagram shows the

site structure for a user who is not logged in and covers three possible navigation scenarios; first if they are a registered user and about to login (clicking “Login”), second if they wish to register for the course (clicking “Register”), or third if they wish to learn more about the course (clicking “About”). All of these options can be reached via the homepage, which in keeping with good practice, can also be accessed from any page on the website. Course content meanwhile is only two clicks away from the homepage, either by logging in or registering.

The diagram immediately below shows an overview of the site structure for a registered user who is currently logged in. In this state, the user will generally be interacting with course materials, and therefore course content is now only one click away from the homepage as a registration or login process is no longer applicable. The other navigational choices are adjusted in terms of both relevance and salience to the logged in state, so that the “About” link has been replaced by a “Course” link (linking directly to the course), the “Register” link has been replaced by a “Profile” link (where the user can update their personal details and password), and the “Login” link replaced by a “Logout” link.

**Not logged in to course****Logged in to course**

*Figure 4.4.* Overview of course website hierarchy.

*Clear navigation pathway through the course.* Having established the topic areas of the course and an overview of the site structure, the next stage in terms of building the information architecture, was to create a visual overview of the navigation pathway through the course. At this point in time, the topic areas (or modules) were defined but not to the level of specific topics. It was determined during planning meetings that that each topic area would contain a theoretical overview of each psychological performance area followed by applied strategies. So for example, the concentration module would introduce theory behind attentional processes followed by strategies to improve concentration. It was also determined that the pathway through the course would traverse each topic area and build towards a final task of creating a mental training program.

The pathway is represented in Figure 4.5 and describes a course that is made up of 11 modules, with the first introductory learning content (summarised as “Welcome”) being equivalent to one module. The psychological skills training content (summarised as “What you need to know”), forms the body of the content and is equivalent to nine modules. The final module containing the summative task (“Be an elite sport psychologist”), provides the learner with an opportunity to build and submit a mental skills training program, and having done so, receive a certificate of completion with their name on it. Each module was designed for completion in the order specified in the diagram and progress recorded and offered as informational feedback to the learner through the course interface. Learners could leave the website at any time and be able to return to where they left off when they next logged in.

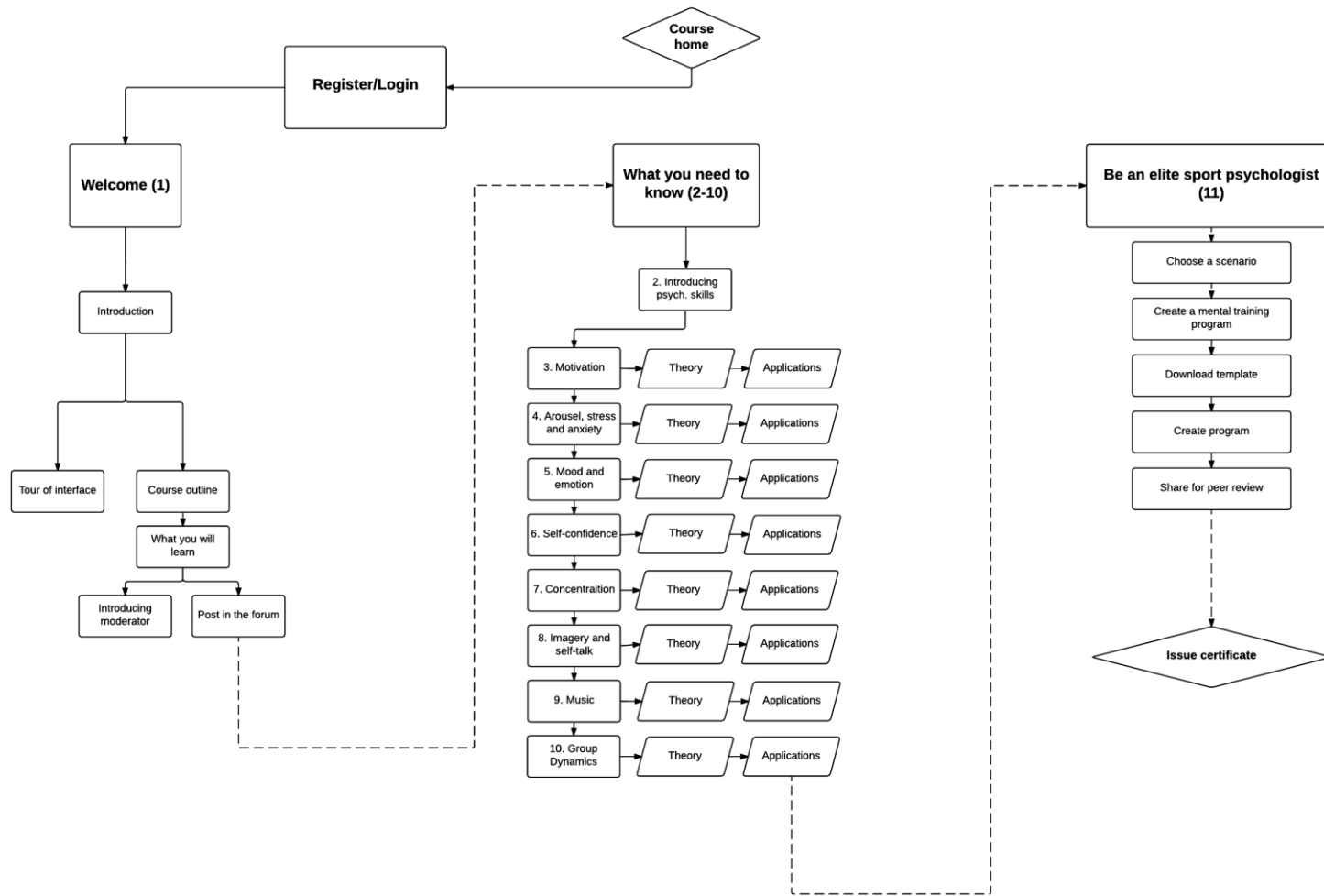


Figure 4.5. Navigation pathway through the course (final version).



**Stage 3: Selection of online learning platform.** In the present research, the term *online learning platform* (also known as an e-learning platform), refers to an online learning environment with associated tools and services for delivering learning content, and for facilitating interaction and communication between learners (Ardito, et al., 2006). An important consideration when selecting the right platform for this course was to ensure that the technology had features that would potentially support learner autonomy, competence, and relatedness. Consequently, the open source content management system WordPress was chosen as the online learning platform for *Elite Sport Performance: Psychological Perspectives*.

**WordPress.** WordPress began its life as a blogging platform in 2003, but has since evolved considerably to support websites that offer a range of online services including e-commerce, multimedia, membership sites, and personal portfolios. It is written in the open source language PHP and connects to a backend open source MySQL database, which stores all the content. It is highly customisable and extendable and is supported by excellent documentation and a large online community of developers.

WordPress was chosen as the online learning platform for *Elite Sport Performance: Psychological Perspectives* because it matched a number of criteria. Firstly, it is licenced through an open GNU General Public License, which is not only consistent with the open philosophy of the course, but also allows a developer to make bespoke changes to source code and therefore customise features as required. Secondly, WordPress is a ubiquitous web product with a global community of users, and according to one survey, over a quarter of all websites on the Internet are offered via the platform (see “Usage statistics and market share of WordPress for websites,” 2015). Thirdly, WordPress is a secure and robust platform when

combined with a quality hosting service and therefore less prone to downtime or crashes if good practice is followed. Finally, WordPress is *extensible*, meaning that it can be extended and grown to accommodate new features. Wordpress can be extended through the installation of modular pieces of code called plugins and themes that allow new capabilities to be added to a website. A plugin is a code module that can be added to the functionality of WordPress, but is not part of the core features of the product. Meanwhile, a theme is a visual layer or skin for the website that is highly customisable.

***LearnDash.*** A commercially available plugin called LearnDash was purchased to provide the learning management functionality for *Elite Sport Performance: Psychological Perspectives*. LearnDash has a number of features that made it suitable for this course. Firstly, learning content could be structured to meet the specification mapped out previously by allowing the course to be divided into modules and topics and then linked together sequentially. Secondly, it can be wholly integrated with other plugins so that for example, a discussion forum can be added to the course. It can also be integrated with native WordPress registration features allowing users to register and enrol on a course. Thirdly, the learner can sequentially unlock content as they progress through the course, thereby potentially increasing their perceived sense of competence over time. LearnDash also has a range of features that facilitated the research evaluation that will be further articulated in the next study, including tools for constructing questionnaires and reporting activity, i.e., registration, enrolments, learner progression, and course completions. Finally, for anybody with experience of WordPress development, LearnDash is a relatively easy product to install and integrate with other functionality.

**Hosting and domain name.** All websites need to be hosted on a web server and must have a unique domain name to identify them. Choosing a suitable hosting service for *Elite Sport Performance: Psychological Perspectives* was a vital step, because the user experience of interacting with a website can be severely eroded if the website is slow to respond or goes offline. From a usability perspective, if the website is slow to load or unresponsive then the user is likely to become frustrated and leave the website (Nielsen, 2010). For *Elite Sport Performance: Psychological Perspectives*, hosting was purchased from a service provider called DreamHost and the domain name *elitesportpsy.org.au* was purchased from a reputable registration company called Melbourne IT.

DreamHost is an internationally recognised hosting company, which has received a number of industry awards and offers a WordPress optimised service called DreamPress. DreamPress includes a dedicated servers called Virtual Private Servers (VPS) so that all loading on the website will exclusively come from those users who interact with the course. A VPS contrasts with shared hosting where many websites share a single web server and consequently run the risk of performance issues in which one website is affected by the heavy loading on an adjacent website. Each DreamPress service offers two VPSs, which are configured as a pair. One VPS was for dedicated hosting of WordPress and the other for hosting the MySQL database, which stores all content and user information. DreamPress has superior features that contributed to optimal performance, and therefore provide an improved user experience including:

- Content caching on the server which speeds up the load time.
- Scalable memory to respond to large numbers of concurrent requests from multiple users.

- Security features to mitigate against possible hacking such as brute force and distributed denial of service attacks.

The domain name *elitesportpsy.org.au* was purchased because it is both short and gives nominal insight to its purpose (elitesportpsy), is non-profit and non-commercial (.org as opposed to .com), and related to the host country (Australia). Having procured a domain, web hosting, and the LearnDash plugin, the learning platform was set up in three steps. Firstly, WordPress was installed by logging into the web hosting administration panel (called cPanel) and following the automated steps (see “DreamPress 2”, n.d.), secondly setting up administration credentials in WordPress, and finally installing the LearnDash plugin.

### **Production Phase**

The pre-production phase triggered the design process by setting some goals, mapping out a course structure, and selecting and installing a learning platform. The next phase of the design was the production phase, which ran from April to September 2015 and comprised of four stages, three of which happened concurrently and all with a degree of iteration based on testing and feedback:

- **Stage 4a:** Selection of course content.
- **Stage 4b:** Design of the visual style of the course and interface elements.
- **Stage 4c:** Design of learning activities and tasks.
- **Stage 5:** Production of the course by populating LearnDash with course content.

**Stage 4a: Selection of course content.** Having mapped the course structure earlier, further work was required on the selection of relevant course content. Once this content had been collected, it could later be integrated into the course during the content production stage.

*Elaborating on course content.* The navigation pathway presented earlier in the chapter provided a general overview of the modules that would form the course, and indicated that each topic area would have theoretical and applied content. This pathway required further elaboration and a content plan was developed to provide more detailed information on what would be included in the course.

The content plan for *Elite Sport Performance: Psychological Perspectives* can be found in Appendix C. A content plan is a document that provides a detailed summary of the intended content of the website and is often used by professional web teams to help plan and gather relevant content for a new website. Each module was divided into individual blocks and an estimation made of the amount of time it would take to complete them. The content was then broken down into specific pieces of content with consideration always given to addressing the three basic psychological needs that help drive intrinsic motivation. A set of learning activities was proposed and specific competencies articulated. Finally, possible content sources were identified for further investigation as to whether they would be suitable for the course.

*Further iteration.* It is worth noting that further iteration of course content did take place throughout the lifespan of the design process. For example, when the course content was populated into the site via LearnDash (to be described later in the chapter), it became clear that too much content had been proposed, and after careful consideration it was decided that this might overwhelm the target audience. The amount of course content was reduced somewhat by removing a set of optional pathways on injury response, overtraining, and cultural considerations, and reducing the amount of content on group dynamics.

**OER selection.** The selection of Open Educational Resources (OERs) was a significant and ongoing activity throughout the production phase. An essential quality of the course was that it was to be released under an open licence with integrated open content from around the web to support the learning. Qualitative judgements for the selection of open content were made using a range of criteria including: a) relevance to the topic area; b) suitability to the target audience e.g., not overly technical; c) likely engagement e.g., the content is inherently interesting; and d) production values i.e., the OER is of high design quality.

The open textbook *Secrets of Asian Sport Psychology* (Terry et al., 2014) was the primary OER integrated into the course. The book contains original content on best practice approaches in elite sport psychology from a range of experts working within the Asian, Australasian, and Pacific region. The book itself contains embedded openly licensed content from a range of online sources, such as Wikimedia Commons and Flickr and can be downloaded as a whole book or on a chapter-by-chapter basis.

To search for OERs to support the course, a number of online content discovery tools were appropriated. Many content providers and search engines have integrated filters to help uncover content that is openly licenced. For example, Google has recently added a usage rights filter to its Google Images product, which allows a user to search on images based on specific Creative Commons licences. Other content providers have similar functionality and in this course, content was sourced from: Flickr and Wikimedia commons (for images), YouTube and Vimeo (for video content), and SoundCloud (for audio content). In keeping with the open practice, content creator names and specified licences were recorded for future attribution.

***Other sources of content.*** As mentioned earlier in this chapter, following an audit, some content from the first iteration of the course was repurposed for this second iteration. In addition, three other sources were also drawn upon to guide suitable learning content, each of which were the intellectual property of the course convenor:

- Two books titled *The Winning Mind: Fine Tune Your Mind for Superior Sports Performance* (Terry, 1989), and *Inside Sport Psychology* (Karageorghis & Terry, 2010).
- An early foundational course offered at USQ and developed by the course convenor.

***Development of new content.*** Much of the content for this course was drawn from a range of sources and synthesised into a web friendly style. However, new content was also created completely from scratch based on the requirements of the content plan. For example, a set of hypothetical athlete personas presenting particular psychological performance problems, were created to support the final activity. This will be discussed in greater detail later in the chapter.

***Finalisation of site structure.*** Having considered the content for the course in depth, a finalised and definitive course structure was created to map the course content. This can be viewed in Figure 4.6 and shows how each module is divided into the specific subjects that are equivalent to one webpage of content in the overall course structure.

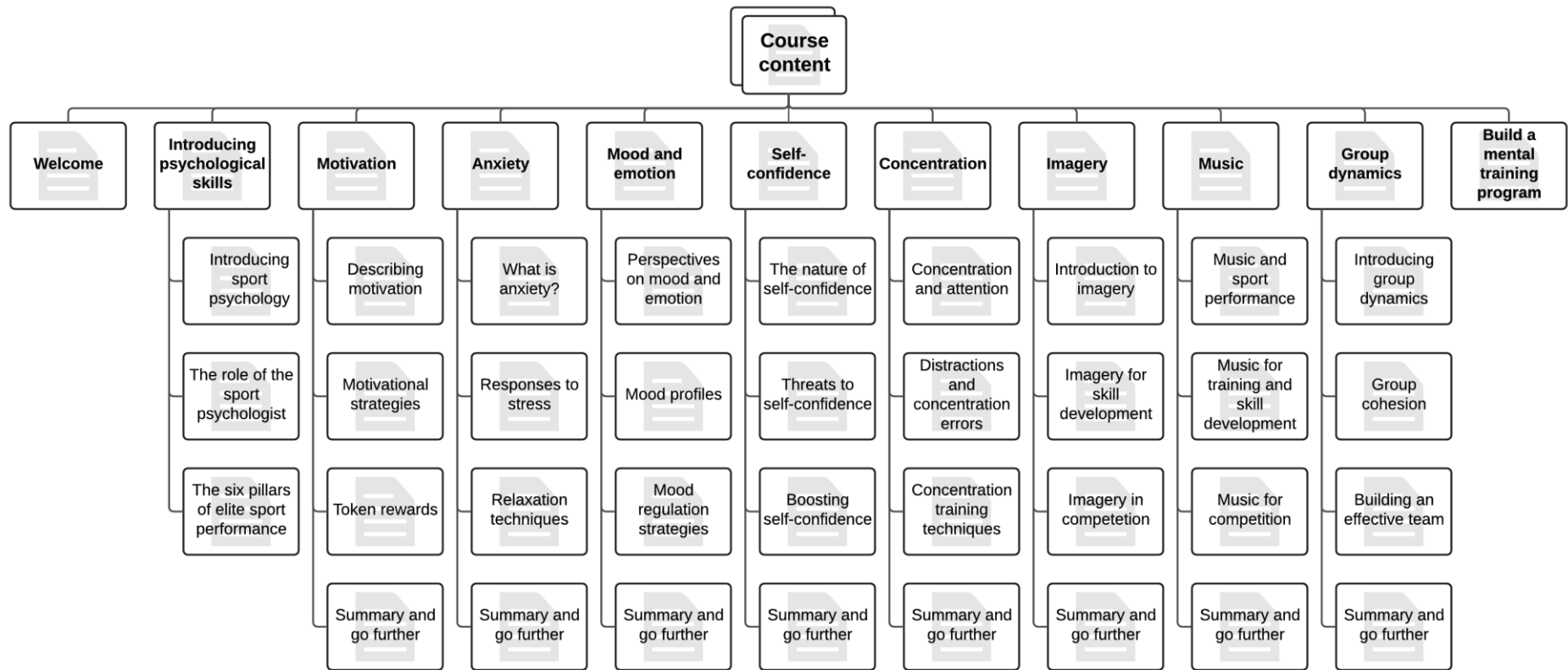


Figure 4.6. Map of course structure showing all modules and topic areas (final version).



**Stage 4b: Visual and interface design.** The importance of the visual design of *Elite Sport Performance: Psychological Perspectives* cannot be understated in the present research. An aesthetically pleasing interface with consistent and logical interaction elements contributes heavily to a positive user experience for all learners. Furthermore, it can be argued that if close attention is not paid to the quality of the interface, then there is a strong possibility that the learner's perceived sense of competence will be undermined and increase the likelihood of them leaving the course. Website users tend to make an evaluation judgement on the quality of website based on its visual design (De Angeli, Sutcliffe, & Hartmann, 2006; Hartmann, Sutcliffe, & De Angeli, 2008) and therefore a high degree of attention to detail and many hours were taken on creating a distinct and strong visual design.

In the present research, visual and interface design refers exclusively to the front-end of the website, or to put it another way, the part of the website that users can see or interact with (remembering that visually impaired users will interact with the site using a screen reader). This work constitutes in no particular order: the layout of webpages, styling elements, use of fonts and colours, graphic design, developing interactive features, and ensuring responsiveness to access device (e.g., smartphones and desktop computers). For *Elite Sport Performance: Psychological Perspectives* the visual design process was simplified somewhat by installing a WordPress theme that offered a template within which further design could occur.

**Installation of WordPress theme.** A WordPress theme is a set of files held in a single folder on the web server and installed via the WordPress dashboard. The theme is responsible for the front-end look and feel of a website and is independent of the site's content. Therefore, installing a new theme with the purpose of replacing an old one or to refresh the look and feel of a website, will not affect the textual

content or media embedded. WordPress themes can also be customised to suit the requirements of a design project and indeed significant customisation was made to *Elite Sport Performance: Psychological Perspectives*. A WordPress theme folder contains:

- Files written in HTML and PHP, which provide template page structure.
- Cascading Style Sheets (CSS), a set of files that provide layout and style properties including fonts, colour, formatting information, and element positioning.
- Function files written in PHP that allow for further theme customisation and extension of functionality.
- JavaScript files to deliver interactivity and responsiveness to user behaviours.

For *Elite Sport Performance: Psychological Perspectives*, a premium WordPress theme was purchased and later customised. A premium theme, as its name suggests can be regarded of high quality but generally without being prohibitively expensive. For this course, the chosen theme called Invent, brought a number of advantages. First, the template was both modern and clean looking, had smooth and legible fonts, uncluttered in layout, and made optimal use of white space. Second, the theme was highly customisable making it possible to initiate bespoke changes to both styling and layout. Third, the theme was extremely compatible with the LearnDash plugin, whereas according to Learndash documentation, some combinations of themes and plugins can interfere with functionality. Finally, the selected theme was highly responsive and therefore optimised to work across different access platforms including desktop browsers, smartphones, and tablets. This was an important requirement as it meant that learners could access the course on a device that suited them and also in different situational

contexts e.g., when travelling, at home, or in a formal space, thereby contributing to autonomy support.

***Wireframes to represent functional elements.*** Wireframing is an established user-centred design technique used to represent the functionality of a webpage through a schematic diagram. A wireframe acts as a model of how a webpage will function as opposed to appear and purposely does not include graphics or styling information. A wireframe has the advantage of allowing a designer to position and move interactive elements as required and may include menus, buttons, forms, multimedia, and text. Two wireframes were prepared for *Elite Sport Performance: Psychological Perspectives*, the first described the functional elements the course homepage and the second of a standard course page. Each wireframe had a different purpose; a course page wireframe contained elements that would support learning activities and navigation through the course, meanwhile the site homepage wireframe contained elements that would promote and provide information about the course as well as support registration and logging in.

Figure 4.7 illustrates the wireframe of a typical course page and offers a schematic of the webpage as viewed through a typical desktop browser. The header contains the website logo and main navigation menu for a logged in user (in this example). Underneath the header, the webpage is divided into two columns. The wider left column contains a main image that will support the learning content to follow. It was intended that these images would be high quality photographs of sporting action that complement and stimulate interest in the subject matter. Beneath the image is the learning content and this is represented in the wireframe as standard dummy text. In the right column (or sidebar), the course navigation, progress bar, link to the discussion forums, and attribution information are represented. Finally,

the learner can navigate backwards and forwards through the course via links at the bottom of the page.

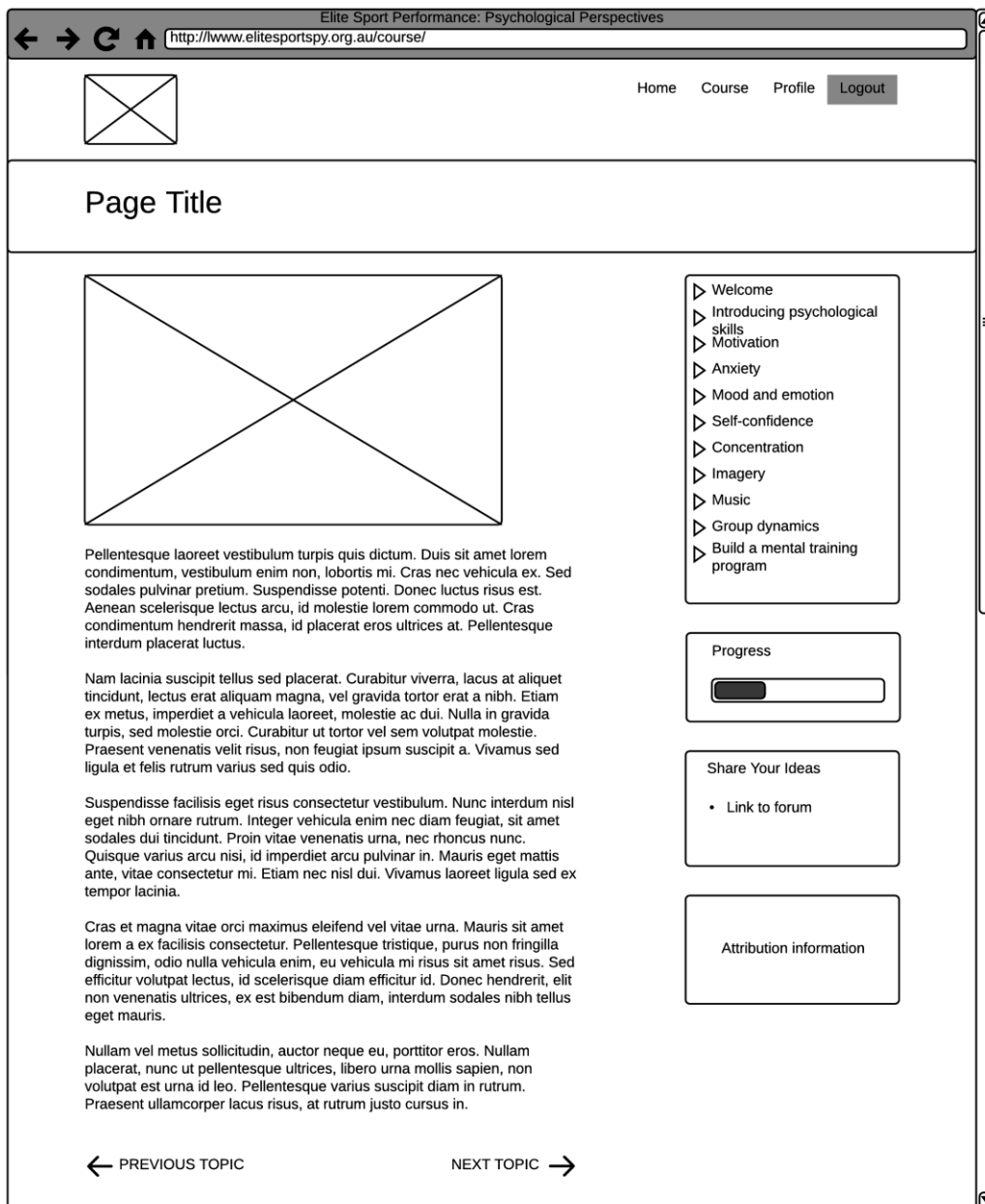


Figure 4.7. Wireframe of a typical course page containing functional elements.

A wireframe for the homepage of *Elite Sport Performance: Psychological Perspectives* is provided in Appendix D and details the layout as viewed through a desktop browser when scrolling from top to bottom. This wireframe had more functional elements to display and therefore is represented at a lower resolution than the previous diagram described above. The wireframe includes: the webpage heading and top level menu, a banner slideshow to display promotional images, a carousel that will allow the user to find out more about the course, a promotional video, further promotional content, an image which also contains an inspirational quote, a login box, details about licencing, and finally the page footer. A large proportion of the functional elements in the wireframe were designed to support the promotion of the course. It should be noted that the order of functional elements placed the more important content at the top of the page so that a user would see them first when loading the page through their browser and scrolling downwards.

***Interaction flow diagrams.*** Modelling user flow through a website can be helpful in determining the steps that a user may go through to achieve a particular task. It can also help identify possible usability problems at an early stage. An example interaction flow diagram is provided in Appendix D and demonstrates how a user enrolls with the course. The diagram shows that there are a couple of critical points that must be moved through. First, the user must make a decision to register for the course, second they must successfully set up a registration account, third using their new credentials they must login to the course, and finally they must enrol for the course.

***Installation of additional plugins to extend functionality.*** A Wordpress plugin is a discreet software module that can extend Wordpress's functionality. There are tens of thousands of plugins available to install, and developers may be tempted to install unnecessary features if they are not focussed in their thinking about their website's essential requirements. For the present research, 16 plugins were installed that provided useful interface, security, and administrative features. A summary of all plugins used is provided in Appendix E, although three key plugins deserve brief mention, as they in particular offer a richer experience for the learner.

*BbPress* extended the functionality of WordPress by adding discussion forum features and therefore give opportunities to learners to share insights, tackle learning tasks, and co-construct knowledge with others. Meanwhile, *Ultimate Video Player* allowed videos to be embedded in the course from a range of sources including Vimeo and YouTube. It allowed the video player interface to have a consistent look and feel and in accordance support overall usability. Finally, *Revolution Slider* provided a platform to add a visually engaging carousel of images of athletes in sporting action to the homepage and therefore provide a strong foundation for course promotion.

***Further customisation of visual style.*** As indicated earlier, a premium theme was installed to provide an overarching template for the site. The styling of the course was further customised in a number of ways to give it its distinct look using Cascading Style Sheets (CSS) and widgets.

***Style sheet changes.*** CSS is a standard language developed through the World Wide Web Consortium (W3C) to control the presentation layer (the look and layout) of a website. More specifically, CSS contains syntax that can be parsed by a web browser or other user agent to style HTML elements, for example headings,

image borders, and font colours. Furthermore, generic HTML elements can have style information assigned to them based on a class or ID, giving a high degree of control. A style sheet contains a listing of declarations on how all HTML elements in a website should be presented. An example styling used in the course is shown in Figure 4.8 below and indicates the structure of a CSS declaration to describe the colour and animated state of action buttons when hovered over using mouse or track pad. In this example, four buttons have a black-grey colour when hovered over and have an animated transition of 0.3s from their original black to create a subtle interactive effect that is consistent for all interactive buttons on the course site.

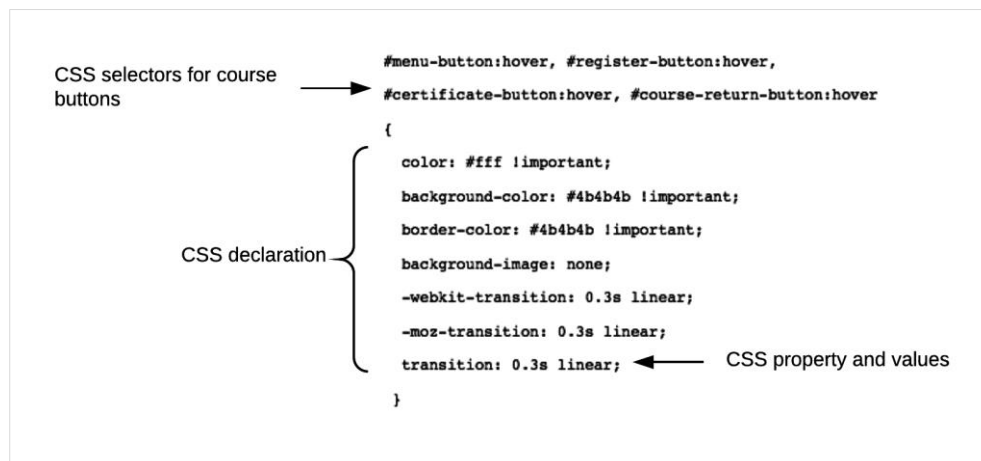


Figure 4.8. CSS style code for action buttons such as registration buttons.

In *Elite Sport Performance: Psychological Perspectives* the CSS changes implemented either updated existing template styles or added new custom styles to support new features. In addition to the action buttons described above, styles were created for: the site navigation menu, link styles, logo positioning, block quotes, learning activity boxes, login boxes, toggle boxes, discussion forums, navigation sliders, timelines, expert insights, questionnaires, research participation agreement, audio player display, and a concentration grid exercise.

*Widgets.* Widgets are bespoke blocks of content that can be added to webpages of a WordPress driven website. By default, WordPress offers a large range of widgets including calendars, news feeds, and image galleries. In the interest of simplicity and usability, only five widgets were added to the course and appeared on all pages in the right hand sidebar. The first widget displayed a personalised welcome message to the learner when logged in. The second widget was the course navigation menu, which displayed links to all course modules, and when clicking on a specific module revealed its constituent topics. The third widget was a progress bar that fills up over time as the learner completes individual modules. The fourth widget provided a “Share Your Ideas” message with a corresponding link to the course discussion forum. Finally, the fifth widget provided Creative Commons licencing and attribution.

*Colour.* A consistent but limited colour palette can help reinforce the aesthetic and functional qualities of a website. The colour palette used for *Elite Sport Performance: Psychological Perspectives* is shown in Figure 4.9 and combined a monochromatic scheme around white, grey and black with a light use of green in the course navigation and on the homepage. The rationale for a minimal use of colour was to maximise the impact of video and photographic content, and to have consistent and identifiable interactive elements including for example, the black buttons and white learning activity boxes.



#EEEEEE	#F5F5F5	#FFFFFF	#000000	#4AAF46
Home page alternating segments	Main body text background	Learning activity boxes	Interactive buttons and controls	Progress bar
Home page icons		Sidebar boxes	Page header	Course menu icons
Progress bar header		Course header		Home page quote

*Figure 4.9.* Colour palette with hexadecimal RGB colour values and examples of particular areas of the site that the colours were utilised.

*Photography.* High quality sporting photography was embedded throughout the course and served the purpose of capturing attention, immersing the learner, and supporting the specific topic that followed. Openly licenced photographs, many of which were taken by professionals were curated for the course, and were of elite athletes in competition or training from a diverse range of sports and competing nations.

*Overview of visual design.* Having described the visual design process and before providing details of learning activities and content integration, it is worth describing the finalised visual interface of *Elite Sport Performance: Psychological Perspectives* in more detail. The course as completed by the learner can currently be accessed online at <http://elitesportspy.org.au> using the following login credentials: *Username:* guest and *Password:* openview. The course homepage will be described followed by an example course page with relevant screen shots provided.

*Course homepage.* The function of the course homepage was firstly to promote the *Elite Sport Performance: Psychological Perspectives* to potential registrants and secondly to act as a login point to the course. The course homepage is

divided into horizontal sections that can be scrolled through by the user via their web browser or other user agent such as a smartphone or tablet device. The webpage header contains the website logo in the top left hand corner and the main menu on the right. The logo of the Asian-South Pacific Association of Sport Psychology (ASPASP) was used for the website logo as the organisation had officially endorsed the course as an open access initiative (in keeping with the first iteration).

The main menu had a number of interactive and visual cues to help orientate the user. Firstly, on rollover with a mouse pointer, the text of each menu item would switch into a hover state and change from black to grey in accordance with the site's colour palette. Second, a bar underneath has a thick underline on the item that indicates the current page and therefore helps to orientate the user to their current navigational position within the website architecture.

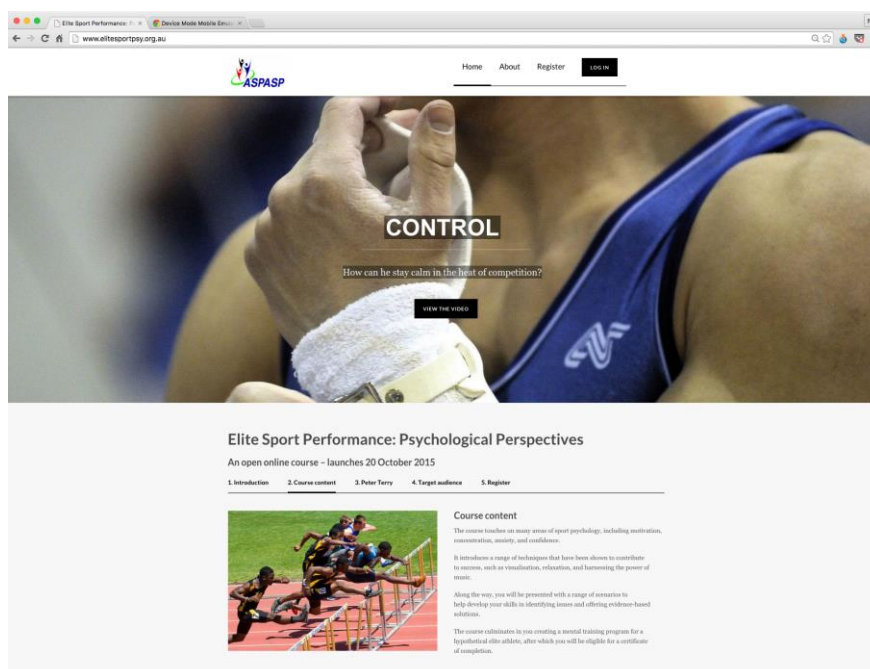


Figure 4.10. Course homepage (top section) as viewed through a browser.

The top section contains a banner slideshow with three large images of athletes in sporting action: a swimmer, an archer, and a gymnast (Figure 4.10). The banner slideshow rotates the image every 7.5 seconds and uses a smooth animated

transition effect to avoid jarring the user experience. Each slide has a promotional message aimed at engaging the user's attention, for example the swimmer slide has the message "*Mental Strength: How does the mind and body combine to create a winner?*" Underneath each message is a "Watch Video" button that when clicked upon takes the user to a promotional video further down the homepage.

Beneath the banner slideshow is a carousel which can be navigated through in a particular order and therefore provide pertinent information about the course. Figure 4.11 illustrates how this section appears on a tablet, and it can be seen that it uses the same navigational bar design has the main menu. Clicking, or swiping on a mobile device, allows the user to navigate through the supporting information before being given the opportunity to register for the course.

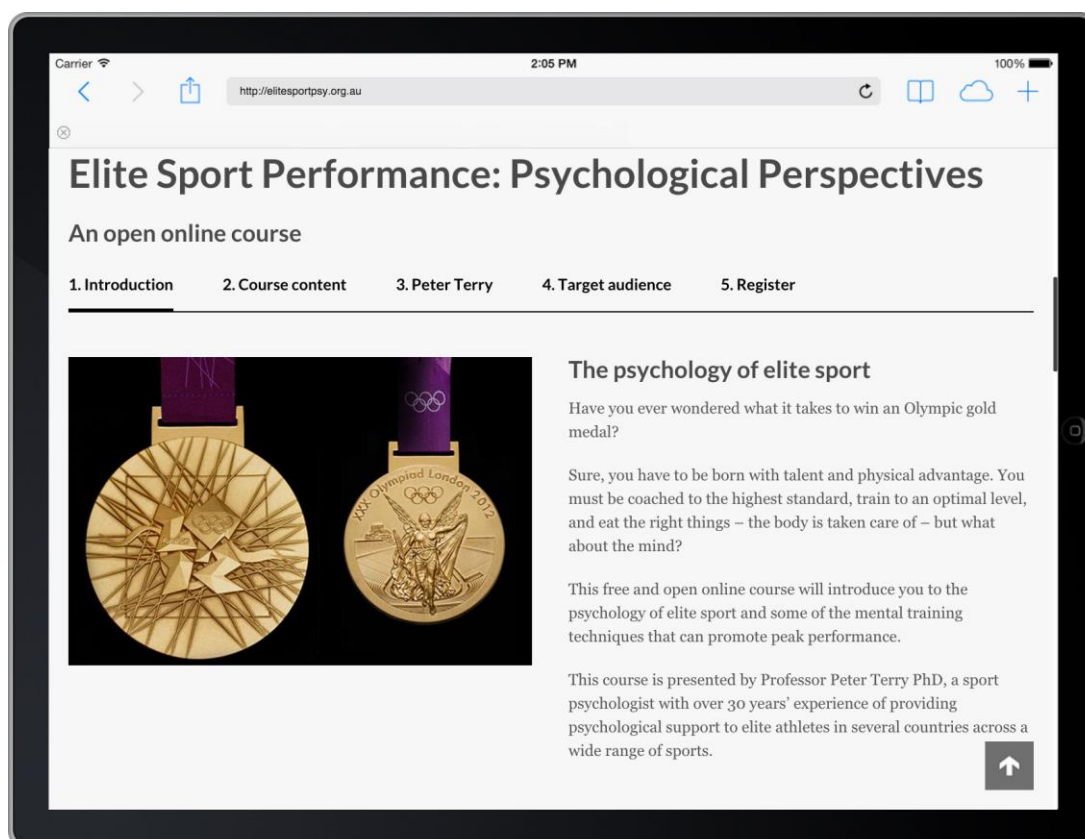
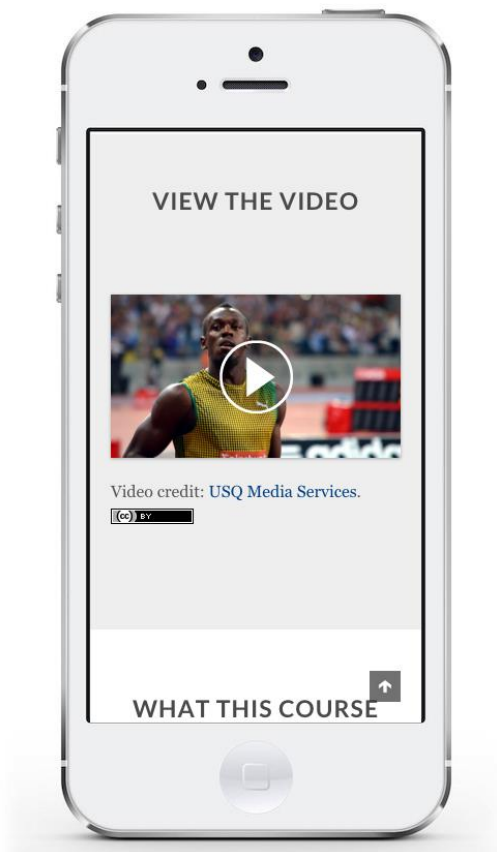


Figure 4.11. Course homepage carousel as viewed through on a tablet.

The section directly below the carousel contained a three-minute promotional video narrated by the course convenor. The purpose of the video was to provide further information and context about the course as well as introduce the expertise of the course convenor. Figure 4.12 provides a screen shot of this content as viewed through a smartphone.



*Figure 4.12.* Course homepage video as viewed on a smartphone.

The lower sections of the homepage provided further promotional content. A screenshot is presented in Figure 4.13 and shows two sections; a “What this course offers” section which summarises some of the learning opportunities on offer, and a stylised photo of a runner accompanied by an inspirational quote from former Olympic athlete Lynne Jennings. A monochromatic green layer was placed over the image to reinforce the visual style of the website and was consistent with the colour palette described earlier in this chapter. A final section (not shown Figure 4.13) had

a login box (acting as an alternative point of course entry), Creative Commons licencing information, endorsement from ASPASP, and the homepage footer acknowledging the use of WordPress and LearnDash to create the website.

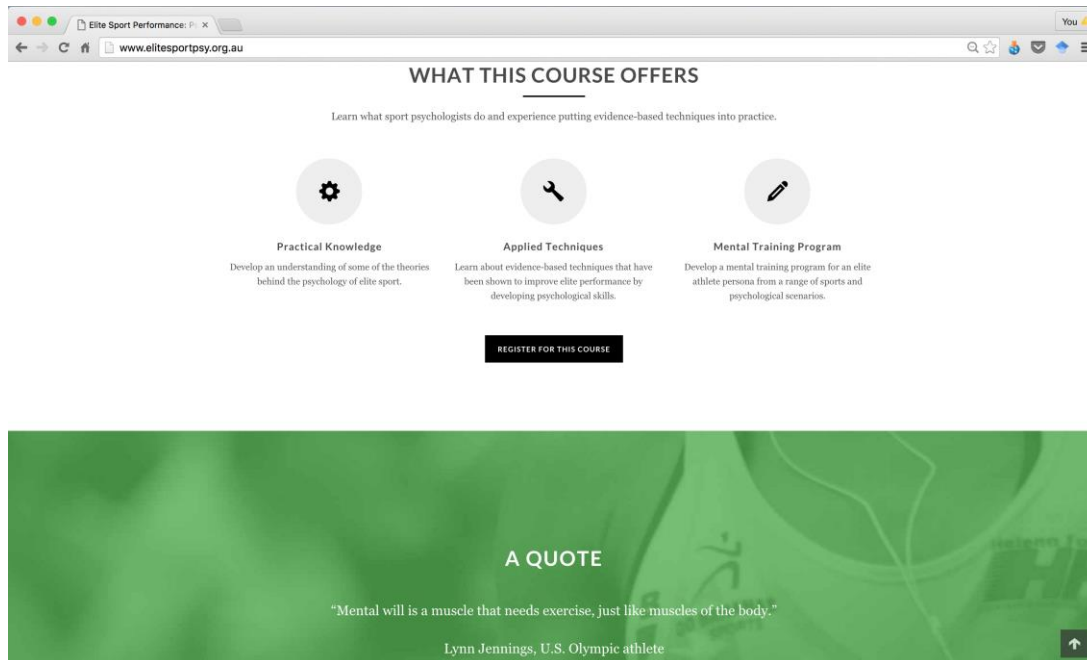


Figure 4.13. Course homepage (lower section) as viewed through a desktop browser.

*Course pages.* The course pages of *Elite Sport Performance: Psychological Perspectives* required a rich and engaging visual identity, which focussed on providing a positive user experience, meeting basic psychological needs, and supporting specific learning activities. Figure 4.14 provides a screenshot of an example course page in the music module and characterises the visual design of content throughout the course. Fuller descriptions of the visual elements found on a course page are described next, once again navigating through the page from top to bottom.

It can be seen from Figure 4.14 that the page has the module title in a large font on black background, the design intention being to orient the learner to the topic area that they are working on and therefore a sense of place within the course. A perusal of the right column shows a number of functional elements to be found on all

course pages including the progress bar and course navigation. It can also be seen that the menu is arranged by module with, in this example, the music module open and its constituent topics listed below. Moving to the main body of learning content, course participants are presented with an image of an athlete in action. These images are used throughout the course and serve the role of supporting engagement with the learning content at the same time contributing to the overall visual quality of the page. In addition to being Creative Commons-licenced, all images in this position on the page have a standard size and accompanied by caption plus suitable attribution information. Below, the image is the body text of the learning content presented in a serif font. A serif font was chosen because this type of font can enhance the readability of longer passages of text.

The screenshot shows a web browser window displaying the ASPASP course page for 'Music'. The browser address bar shows the URL 'www.elitesportpay.org.au/lessons/music/'. The page has a navigation bar with 'Home', 'Course', 'Profile', and a 'LOG OUT' button. Below the navigation bar is a black header with the word 'Music' in white. The main content area is divided into two columns. The left column features a large image of a runner wearing headphones, with a caption below it: 'Runner with headphones. Image credit: Kai Chan Vong'. Below the image is a paragraph of text: 'Music and sport share a close relationship. Some music tracks are synonymous with famous movies about sport, such as the *Chariots of Fire* theme by Vangelis or *Eye of the Tiger* by Survivor, used in *Rocky III*.' This is followed by a list of items: 'Chariots of Fire Theme' and 'Eye of the Tiger'. Below this is another paragraph: 'Music has strong associations with the Olympic Games. The opening ceremony of the London 2012 games showcased British music, from classical composers to modern dance music, via the Beatles, the Rolling Stones, and David Bowie. Music is also an integral part of several Olympic events including rhythmic gymnastics, synchronised swimming, and ice skating.' This is followed by a list of items: 'Clip from London 2012 Olympics Opening Ceremony' and 'Yuna Kim, figure skating double Olympic medallist at Sochi 2014'. Below this is another paragraph: 'Music also plays a huge role in the multi-billion dollar fitness industry with dedicated playlists for exercise classes and jogging. Recently, for example, the music streaming service Spotify announced a running playlist service that identifies a runner's tempo and matches music to it.' This is followed by a list of items: 'Spotify Running'. Below this is a section titled 'Music and elite sport performance' with a sub-heading 'Music is ubiquitous in training venues. It is played in gymnasias, athletic stadia, and even swimming pools. Is the'. The right column features a 'WELCOME, GUEST VIEWER' message, a 'YOUR PROGRESS' section with a green progress bar, and a list of course topics: 'Welcome', 'Introducing psychological skills', 'Motivation', 'Anxiety', 'Mood and emotion', 'Self-confidence', 'Concentration', 'Imagery', 'Music', 'Music and sport performance', 'Music for training and skill development', 'Music for competition', 'Summary and go further', 'Group dynamics', and 'Build a mental training program'. Below this is a 'Return to Elite Sport Performance: Psychological Perspectives' link. At the bottom of the right column is a 'SHARE YOUR IDEAS' section with a 'Course Discussion Forum' link. At the very bottom of the page is a small footer: 'Elite Sport Performance: Psychological Perspectives by Peter Torry and Neil'.

Figure 4.14. Example course page containing visual design elements.

The use of negative space played an important role in the course. Negative space refers to the areas of a webpage that are absent of content, or to put it another way, the spacing between elements plus margins and padding. Negative space serves the purpose of laying out content appropriately so as to avoid overwhelming the user with visual information as well as to help present information in a logical and uncluttered way. Besides adding to the aesthetic quality of the course, the appropriate spacing of information assists learners in terms of the overall usability of the course interface. It can be argued that optimising the layout of page elements offers support in building competence, and also helps learners in making choices such as choosing which learning materials they wish to download, therefore supporting autonomy.

*Styling of functional elements to support learning tasks.* Before examining the learning design in the next section, it is worth briefly mentioning that styles were created to support learning and activities. Table 4.1 provides a description of some of the functional elements, all of which had a distinct and consistent style across the whole course. This consistency again helps learners orientate themselves in the course, provides a sense of presence, and contributes to the overall aesthetic of the design.

Table 4.1

*Visual design features to support learning*

<b>Design element</b>	<b>Description</b>
Supporting images.	Creative Commons licensed images of athletes in action. Images have a standard size depending on whether they are at the beginning of course content (600 x 400px) or embedded within the body (200x300px and floated right with text wrapping).
Activity box.	Activities are boxed separately from the body text content. The box has a grey gradient header, a one-pixel border, a subtle drop shadow, and a white background. The activity boxes are also used for the course evaluation questionnaires.
Reflection boxes.	A reflection box is similar in design to an activity box and created specifically for personal reflections, but differed by having a “speech bubble” effect and no header.
Toggle box.	A toggle box is used to hide some content before a task had been completed (e.g., watch a video). Toggle boxes sit inside an activity box or reflection box, are grey with a plus icon, transition to black when hovered over, and open when clicked to reveal content.
Slideshows.	Slideshows are used to introduce course experts and the mental training program personas. The boxes have a white background and one pixel border with photos floated to the right.
Video and audio.	A standard audio and video play button are used for all videos.
Link icons.	A number of icons were developed to support links depending on their purpose. For example, the online forum has a “chat icon” and external videos has a “celluloid film” icon.



**Stage 4c: Learning design.** As emphasised throughout in this chapter, the principles that informed the design of the course were derived from self-determination theory. A central aspect of this process was to develop learning activities and interactions using the lens of self-determination theory to guide the design. Therefore, focus was always placed on the design of learning activities that foster a sense of autonomy, competence, and relatedness, by for example, offering meaningful choice, optimally challenging tasks at a level appropriate to a novice audience, and opportunities to share and relate to others. A core feature of the learning design was that all activities would be optional, and in keeping with the self-determination principles of the course, learners could choose to engage with as little or as many tasks as they wished. Additionally, the course would remain open for four months and learners could start and finish the course within a timescale that suited them, thus limiting the time pressures that are common in many other open online course. Finally, authentic learning approaches were adopted for the design of learning activities to provide real world examples of practice, opportunities to do relevant tasks, and to learn from expert practitioners.

***Learning activities.*** Over the 11 modules and 35 topics that made up the course, there were 76 separate activities on offer for learners to participate. The activities were quite diverse with a view to supporting different learning preferences, so for example, some activities involved reading content or watching a video, where as others may involve sharing a personal insight or experience with others. Furthermore, some activities relied upon individual learning as opposed to other tasks, which involved the learner contributing to a social group. A summary of learning activities developed for the course can be viewed in Appendix F, and some example activities are explored next.

*Watching videos to introduce a topic or develop understanding.* The use of video to support learning is a common technique used in both traditional and open education. Videos were utilised to introduce a topic and were often followed by some explanatory text or points for consideration. In some cases, videos acted as “sparks” (Salmon, 2013), which presented introductory information in an engaging way to help stimulate thinking. Furthermore, videos were also used to support autonomous learning through immersion or vicarious experience (Rigby & Ryan, 2016) and to build perceived levels of competence through both expert commentary and real world examples of sporting action.

The screenshot displays a web browser window with the URL [www.elitesportpsy.org.au/lessons/imagery/](http://www.elitesportpsy.org.au/lessons/imagery/). The page header includes the ASPASP logo and navigation links for Home, Course, Profile, and a LOG OUT button. The main content area is titled 'Imagery' and features a video player with the title 'Take a ride on a bobsled'. The video is a first-person perspective shot from inside a bobsled, showing the track ahead. Below the video player, the text reads: 'Video credit: JD Andrews' and 'Watch the first-person perspective video above. It gives you a sense of the high speeds associated with bobsleigh. Imagine that experience in Olympic competition; the adrenaline pumping, the gravitational forces pulling on your body, and the sheer noise of the sled on the ice. Bobsleigh involves a team of two or four athletes hurtling down an ice track in a metal capsule as quickly as possible over a series of runs. It demands a powerful push start, skilful piloting, and efficient weight distribution and drag reduction from the rest of the team. Winning margins in bobsleigh often come down to a few hundredths of a second, and a single mistake can prove the'. To the right of the video player is a sidebar with a 'WELCOME, JOHN DOE' message, a 'YOUR PROGRESS' bar, and a list of course topics including 'Welcome', 'Introducing psychological skills', 'Motivation', 'Anxiety', 'Mood and emotion', 'Self-confidence', 'Concentration', 'Imagery', 'Introduction to imagery', 'Imagery for skill development', 'Imagery in competition', 'Summary and go further', 'Music', 'Group dynamics', and 'Build a mental training program'. At the bottom of the sidebar, there is a link to 'Return to Elite Sport Performance: Psychological Perspectives' and a 'SHARE YOUR IDEAS' button.

Figure 4.15. Example use of video to support learning.

Figure 4.15 illustrates an example video titled *Take a Ride on a Bobsled* presented in the imagery module of the course that immerses the learner into a first-

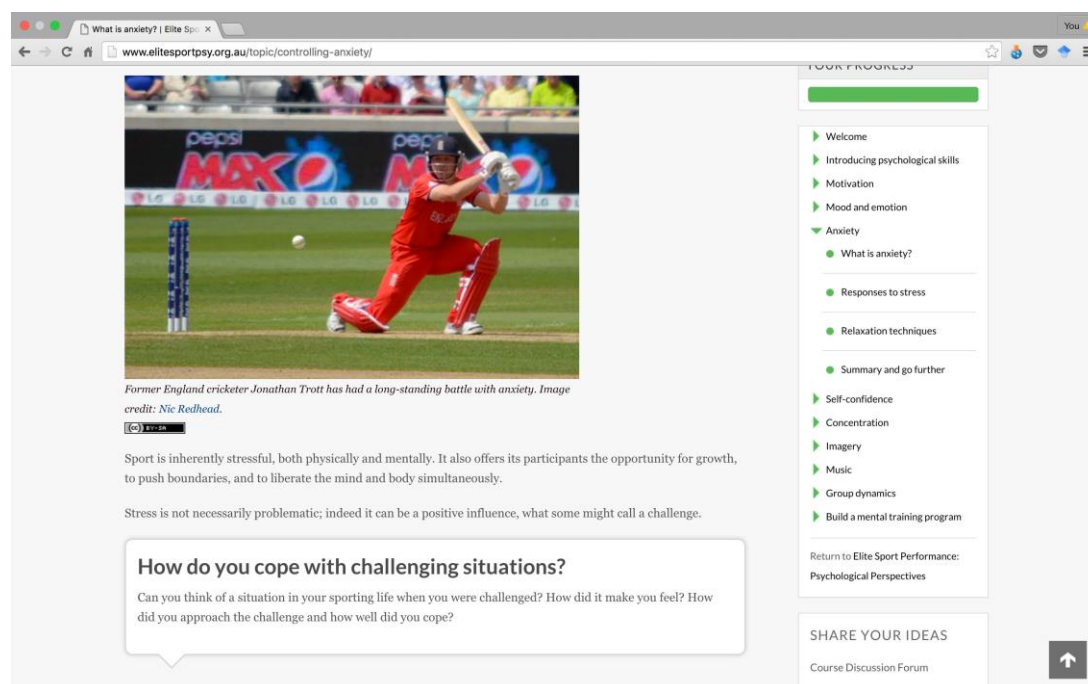
person camera view of a bobsled run. During the video the viewer gets some sense of the high speeds and gravitational forces involved in this winter sport. Once watched, the text underneath introduces the module by providing a short expert testimony about how imagery was used by a British bobsled driver on his way to winning a bronze medal at the 1998 Winter Olympics bobsleigh competition. The purpose of the video is twofold. First, to provide a “spark” to stimulate learning and second to offer an immersive experience, which as mentioned previously in this chapter, is closely associated with the basic psychological need of autonomy.

Videos were also used in the course to help learners consider a topic area more deeply. For example, a series of videos for an activity titled *Getting Back on the Bike* showed dramatic cycling crashes from the Tour De France and asked learners to consider how this affects levels of self-confidence. In a subsequent video, a sport psychologist provides an explanation on how the seriousness of the crash, in terms of actual injury, tends to predict subsequent levels of cyclist self-confidence. She then goes on to provide expert psychological advice on how to get back on the bike and rebuild confidence. Videos further facilitated autonomous learning at the end of a module where an optional opportunity to go further was provided. For example, learners could view an expert sport psychologist explain the attentional skills required to follow a rowing race plan, before being given the option to read the *Rowing in Australia* chapter from the *Secrets of Asian Sport Psychology* (Terry et al., 2014) open textbook.

*Self-reflection, personal experiences, and insights.* The use of critical self-reflection based on both personal experiences and insights can be a powerful tool for learning (Mezirow, 1990). Many tasks were created that required the learner to consider their own personal experiences and beliefs when thinking about a subject.

An example activity is provided in Figure 4.16 that asks the learner to consider how they coped with anxiety in their sporting life. They are given the opportunity to critically reflect from their own recollections on how they may or may not have coped with a challenging event. The activity acts as a springboard to theoretical and practical content about anxiety and coping strategies in which the learner can further reflect on whether they would have found these techniques useful or indeed make use of them in the future.

Learners were also encouraged to share their insights with others on the discussion forum. Not only did this type of activity help foster a sense of relatedness, but potentially build perceived levels of competence by giving the learner an opportunity to demonstrate their own thinking and expertise. An example of this kind of activity was in the motivation module in which learners were asked to share their opinion on whether legendary basketball player Michael Jordan's source of motivation was primarily intrinsic or extrinsic.



What is anxiety? | Elite Sp... x

www.elitesportpsy.org.au/topic/controlling-anxiety/

Former England cricketer Jonathan Trott has had a long-standing battle with anxiety. Image credit: Nic Redhead.

Sport is inherently stressful, both physically and mentally. It also offers its participants the opportunity for growth, to push boundaries, and to liberate the mind and body simultaneously.

Stress is not necessarily problematic; indeed it can be a positive influence, what some might call a challenge.

**How do you cope with challenging situations?**

Can you think of a situation in your sporting life when you were challenged? How did it make you feel? How did you approach the challenge and how well did you cope?

TOUR PROGRESS

- Welcome
- Introducing psychological skills
- Motivation
- Mood and emotion
- Anxiety
  - What is anxiety?
  - Responses to stress
  - Relaxation techniques
  - Summary and go further
- Self-confidence
- Concentration
- Imagery
- Music
- Group dynamics
- Build a mental training program

Return to Elite Sport Performance: Psychological Perspectives

SHARE YOUR IDEAS

Course Discussion Forum

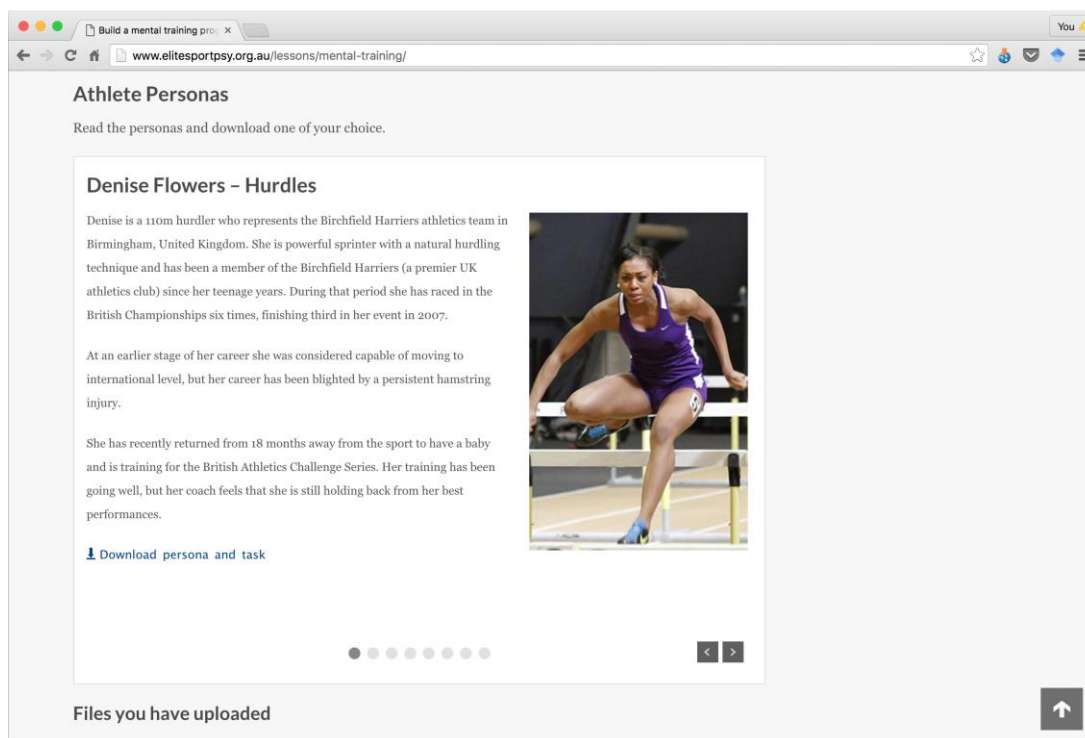
Figure 4.16. Example activity involving critical reflection to support learning.

*Real world authentic learning tasks culminating in the development of a mental training program.* An essential learning design feature of *Elite Sport Performance: Psychological Perspectives* was to give learners real world psychological strategies that practicing sport psychologists use when working with elite performers. From a self-determination theory perspective it was anticipated that allowing learners to practice these highly developed techniques would encourage task involvement and therefore foster a sense of autonomy. Also, real world tasks are an important feature of authentic learning design, which not only help build competence in understanding and developing actual techniques, but also provide tools that can be used later by the learner. Some example tasks are listed below and illustrate the breadth of techniques on offer:

- Developing a goal-setting plan to help create and sustain motivation.
- Taking the Sport Competition Anxiety Test (SCAT; Martens, Vealey, & Burton, 1990) to measure personal levels of anxiety in a competitive sporting context.
- Assessing the mood of self or others by taking an online version of the Brunel Mood Scale (BRUMS; Terry, Lane, Lane, & Keohane, 1999).
- Designing a simulation-training environment for a javelin thrower to model real competition.
- Selecting appropriate music for specific training activities including general stretch, warm up, cardio fitness, and warm down.

The course culminates in a final real world task to design a mental training program for a hypothetical elite athlete after which the learner receives a certificate of completion. The design of this final task was an intricate and detailed process in which eight athlete personas were created using a similar approach to user personas mentioned earlier in this chapter. Each athlete persona represented a performer from

a specific sport presenting with one or more psychological issues pertinent to the topic areas covered in the course; for example a golfer with a putting problem that was beginning to adversely affect his mood. Figure 4.17 provides a screenshot of an example persona and it can be seen that the learner is provided with a brief summary followed by a downloadable detailed description and task. All downloadable personas can be examined in more detail in Appendix G.



*Figure 4.17. Example persona developed for the final task in Elite Sport Performance: Psychological Perspectives.*

Each athlete persona needed to be realistic so a fair amount of time was spent researching specific sporting disciplines and their relevant competitions (e.g., Super League soccer in Malaysia), culturally appropriate names (e.g., Akil Rao from India), and authentic psychological problems (e.g., a loss of confidence coupled with anxiety when returning from long term injury). To accompany each description of the athlete were Creative Commons images of anonymous individuals found through an image search engine. These were cropped and manipulated as necessary to

maintain a sense of authenticity; for example, the image of hurdler Denise Flowers (see also Figure 4.17) was taken from a United States military sporting competition and repurposed for a persona domiciled in the United Kingdom. To increase levels of authenticity, the US military games text was removed from the hurdles using Photoshop to alter the image. Accompanying each persona was a scenario and a set of points to consider, thereby providing structure and task rationale to support basic psychological needs.

To complete the final task, the learners were asked to choose one of the eight personas. It was anticipated that learners would orientate towards a sport that matched their own preferences. Having created the mental training program they were asked to upload their document that would subsequently be shared with others to download and critique if they wished. For completing this task and in recognition of finishing the course, each learner immediately received a certificate of completion, endorsed by ASPASP, and customised with his or her own name (see Appendix H). It is important to note that the certificate was not a surrogate for a professional qualification in sport psychology, but simply recognition of achievement. Also, when taking a self-determination theory perspective, the design intention of the certificate was not to equate to a qualification (that could also be interpreted as an extrinsic motivator), but to signify of the end of the course.

*Integration of the open course textbook for independent learning.* The open textbook *Secrets of Asian Sport Psychology* (Terry et al., 2014) provided a key source of ancillary content for the course that would allow rich exploration of applied approaches in sport psychology. In all, 21 chapters from a range of sports were embedded into the course, and were provided with the anticipation that learners could do further independent reading if they wished. In many cases, relevant chapter

download links were placed at the end of a module to allow the learner to explore the application of psychological training strategies in much more detail. These were placed under the heading of “Go Further” with the intention of providing extra content to support autonomous learning.

*Interactivity for immersion.* Beyond the use of video content to support learning, a number of interactive features were added to the course. One example activity was a concentration exercise, which involved the learner using their mouse (or touch gesture on a mobile device) to find random numbers on a grid against the clock, and therefore understand the challenges of maintenance of attention under pressure. Other interactive tasks included playing an audio recording of a Muhammad Ali monologue to demonstrate the nature of self-confidence, or navigating through interactive slideshows and timelines to explain mood profiles or the history of sport psychology. As discussed previously, these types of features can support immersion and task presence, fostering a perceived sense of autonomy, and therefore internally driving the intrinsic motivation necessary to engage and persist with the course.

*Social learning through discussion forums.* A discussion forum was developed in parallel with the main course that would act as a platform for social learning where contributors could share knowledge, ideas and opinions, and foster their own sense of relatedness. A number of tasks were directed towards social interaction through the various topic threads. For example, in the self-confidence module, course participants were asked to share their personal image of self-confidence (e.g., a lion) and comment on their peers’ contributions. In addition to supporting specific learning tasks, the forum had the functionality to facilitate organic discussion where learners could, if they wished, initiate their own topics and



comment on others. A moderator was also recruited for the course. This role was a voluntary position to be held by somebody with experience of playing sport at a competitive level, who could offer insights and respond to discussion contributions, and weave ideas together.

***Integration of expert knowledge.*** An integral approach to authentic learning is to expose learners to expert practitioners (Herrington & Oliver, 2000). For *Elite Sport Performance: Psychological Perspectives* learners were able to develop their knowledge of psychological skills training through access to expertise in three ways. First, the course convenor, with over 30 years of working with elite athletes in major international sporting events, was accessible to all learners through both the discussion forums and other forms of course communication. Second, all chapters in the open course textbook *Secrets of Asian Sport Psychology* (Terry et al., 2014) were written by practicing psychologists supporting elite athletes in a range of sports and international events including Olympic Games and relevant world championships. Finally, practitioner expertise was directly embedded into each course module through both video content and discrete pieces of content that were termed *expert insights*. Expert insights were generously provided by a number of esteemed sport psychologists on request with each insight relevant to a specific module. Figure 4.18 illustrates an expert insight on the subject of self-confidence and was provided by the Australian cricket team psychologist, Dr. Michael Lloyd. Each insight was relatively short (around 100 words), but rich in detail and provided a unique and personal expert perspective that would be unavailable elsewhere.

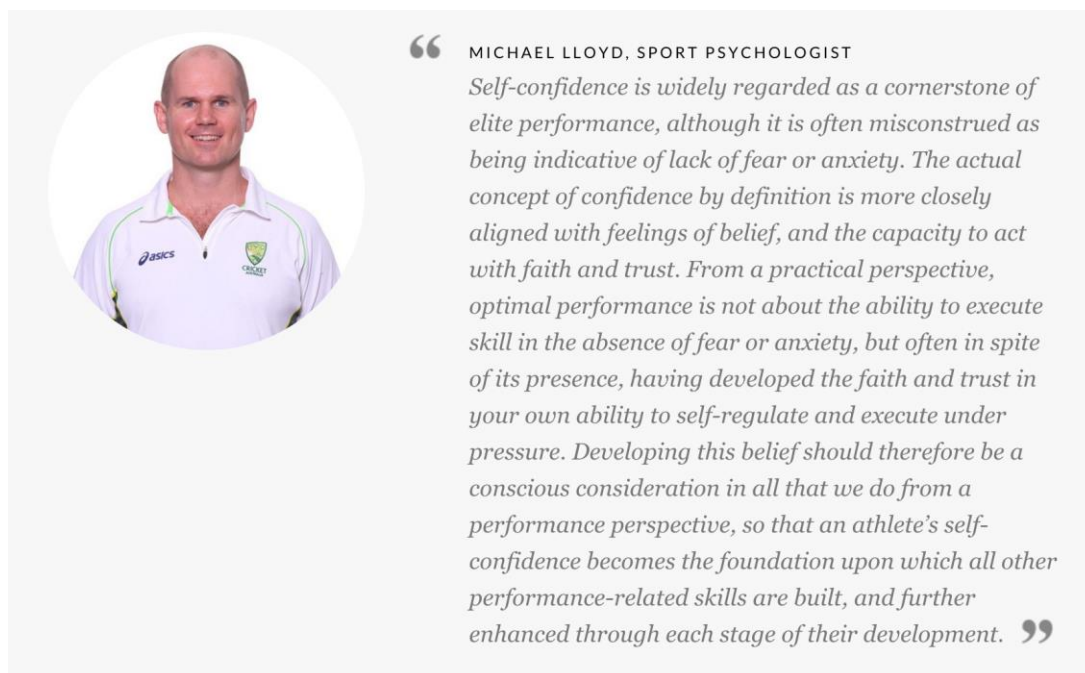


Figure 4.18. Example of an expert insight providing access to professional knowledge.

**Stage 5: Content production.** The final stage of the production phase was to populate the course website with the content developed previously, create three new videos to orientate learners, develop help content, and finally embed evaluation measures that will provide data for the final study in this program of research.

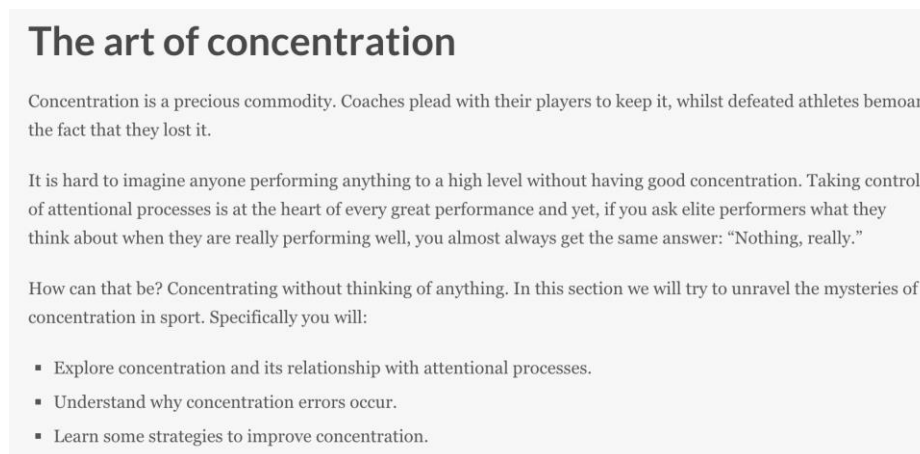
**Population of course website.** As expanded upon earlier in this chapter, the course was managed through the WordPress platform. WordPress includes a visual editor that facilitates the editing and publishing of course content, and over a period of four months, the course website was populated with content and activities. A summary of the amount of course content that was published over this period is provided in Table 4.2 and gives indication of a course of significant size and scope. The course contained 27,000 words of web content, over 100 images, 17 audio and video embeds, 7 interactive features, and over 100 external links to supporting content on the web and chapters from the supporting open textbook.

Table 4.2

*Size of redesigned Elite Sport Performance: Psychological Perspectives*

<b>Module</b>	<b>Words</b>	<b>Images</b>	<b>Video</b>	<b>Audio</b>	<b>Interactive</b>	<b>Links to external supporting content</b>
Welcome	818	1	1	0	0	8
Course introduction	1969	18	1	0	2	13
Motivation	2794	15	1	2	1	9
Anxiety	2862	9	1	3	0	12
Mood and emotion	2761	12	0	0	1	9
Self-confidence	2723	13	1	1	1	3
Concentration	3080	9	2	1	1	4
Imagery	3401	10	1	0	0	10
Music	2379	6	0	0	0	18
Group dynamics	3399	13	1	0	0	16
Mental training program	1713	9	1	0	1	30
<b>Totals</b>	27899	115	10	7	7	132

Web content was written in a style that followed good practice online writing guidelines found on the usability.gov website (“Writing for the Web”, n.d.). More specifically, recommendations that enhanced the readability of the content in an online context were adopted and included: (a) using short paragraphs; (b) having bulleted lists and headers to “chunk” the content and therefore make it more scannable; (c) breaking up longer stretches of text with images or multimedia; and (d) presenting written context in an active voice that addresses the learner informally but directly. An example section of content is provided in Figure 4.19 and illustrates both the writing style and layout of course text.



*Figure 4.19.* Example block of content utilising best practice recommendations for online writing.

***Addition of help content.*** The web analytic data from Study 1 provided some evidence to support the notion that learner competence was undermined by not providing sufficient contextual supporting information on how to use the WikiEducator platform. Furthermore, the data also indicated a strong possibility that some learners were unable to navigate or progress through the course. To help mitigate this issue, a short video with supporting textual content titled *How to Navigate This Course* was prepared. The video provided foundational information on user interaction elements and showed users how to enrol and login, utilise course

navigation features, mark sections complete, and how to take part in the evaluation research.

In addition to the *How to Navigate this Course* video, three short videos presented by the course convenor were commissioned and professionally recorded by the Media Services team based at the University of Southern Queensland. A promotional video was placed on the course website homepage, meanwhile a second video was placed at the start of the course and welcomed learners after enrolment, finally a third video acted to support the final learning task of building a mental training program.

***Embedding course evaluation measures.*** In order to provide an optimal experience for the learner, intention and self-determination measures relevant to the present research were embedded directly into the course in an unobtrusive way as possible. The measures were placed in the course by customising LearnDash's native quiz features and were positioned at the end of course pages to avoid excessive interruption to the learning experience. The embedded questionnaires also offered the advantage of being an alternative to the use of online data collection tools (such as SurveyMonkey) that would take learners completely out of the course website. Chapter 5 will examine the course evaluation instruments in more detail.

Besides the intention and self-determination measures indicated above, Google Analytics code was added to the WordPress theme template. Google Analytics code was therefore dynamically embedded into the HTML of every webpage on the course website and contained a unique identifier that associated the course website with a Google Analytics account. This code facilitated the recording of web analytic data including session times, number of pageviews, user geolocation,

etc. that assisted in the empirical evaluation of the course. Again, web analytic measures will be examined in more detail in Chapter 5.

### **Post-Production Phase**

Having planned and developed the open online course *Elite Sport Performance: Psychological Perspectives*, the final step of the course design process was a post-production phase that involved making sure the website was of the highest quality before launch.

**Stage 6: Quality assurance of course.** The quality assurance process was characterised by iterative changes based on independent feedback from a range of sources. Quality assurance was conducted in four separate ways. First, a rigorous editing process took place to ensure accuracy and readability. Second, expert feedback was sought with recommendations provided on areas that needed improvement. Third, usability testing was undertaken to help uncover any usability problems that could potentially undermine a perceived sense of competence when interacting with the course interface. Lastly, automated web optimisation tools were harnessed to help determine any possible site performance issues such as slow page loading speeds. The quality assurance process took place in the final 6 weeks before the course was launched and will be described next.

**Editing process.** The editing process was carried out by the course convenor, in his capacity as an experienced practitioner of psychological support for elite athletes. He was provided with an administrative login for WordPress and was able to make edits to the text that made quality and accuracy improvements where necessary, such as the use of terminology or technical detail.

**Expert feedback.** It was anticipated that many learners would be drawn from the Asia and South Pacific region and a serendipitous opportunity arose to receive

some feedback from sport psychologists based at the Institut Sukan Negara (National Sport Institute) in Malaysia, who at the time were receiving some consultancy from the course convenor. The sport psychologists provided qualitative written feedback and an issue register was created to log and identify specific problems. Some feedback was discounted either because it was too subjective in nature e.g., disliking the colour palette of the course website, or requesting changes that would result in new content beyond the intended level of the likely audience for the course, e.g., more references to journal articles. However, there was some pertinent feedback that resulted in helpful changes, including the addition of more images to break up the text and some minor changes to content.

*Usability testing.* When viewed through the lens of self-determination theory, it was considered vital that the design of the user interface did not undermine perceived feelings of competence when undertaking learning activities, navigating through the course, or communicating with other learners. Usability testing is an important and necessary step in uncovering major issues with any online service, but is often not conducted. Usability testing is an evaluative process in which participants, who act as representatives of the users of the online product or service, are given authentic tasks to complete and are observed and recorded for later evaluation. Furthermore, in the context of this course, usability testing facilitated the identification of points of frustration when negotiating particular online tasks (Rubin & Chisnell, 2008). Such points of frustration not only diminish the overall user experience, but as inferred by analytic data from Study 1, have the potential to impact on overall engagement with the course. Therefore for the purpose of this study, usability testing acted as a functional process to help validate design decisions made earlier, and resulted in iterative design changes based on the feedback given.

To undertake usability testing, world leading usability expert Nielsen (2012b), suggests that adequate usability testing can be undertaken with as few as five participants, as this number will uncover around 80% of usability problems without making the usability testing process too onerous.

For *Elite Sport Performance: Psychological Perspectives*, a concurrent think aloud test (CTA; Bergstrom, 2013) was deployed with five participants, four of whom were students. CTA testing is a popular methodology for conducting usability tests (Van Den Haak, De Jong, & Schellens, 2003), and involves participants verbally expressing their experiences when completing a designated task. Ethical approval was received from the University of Southern Queensland Office of Research, Human Research Ethics Committee (Approval No. H15REA006; see Appendix I) to carry out the CTA testing. Participants were presented with an information sheet and signed the consent form (see also Appendix I). Over five separate sessions each lasting approximately 30 minutes, participants were asked to complete a range of tasks e.g., registering for the course, navigating through the course, and doing a learning activity, whilst at the same time verbalising their opinions or frustrations. Concurrently, participant verbalisations and screen interactions were captured and recorded using QuickTime software on a Mac laptop. An example CTA test protocol given to one of the participants is found in Appendix J. Following completion of the testing, all audio was uploaded into secure cloud storage to be downloaded later for review.

To review the audio for each participant, an issues register was created similar to the one developed for the expert feedback described previously. In general terms, no major usability problems were found that would prevent potential learners from registering and engaging with the course. However, there were a few issues that



caused some level of frustration and confusion, and therefore could potentially diminish the experience of doing the course. Table 4.3 summarises the recorded issues and subsequent remedial action taken to improve the overall usability of the course interface.

Some limitations of the CTA approach were observed during the testing. First, by requiring the participant to verbalise their thoughts during a task, attention was naturally split between action (undertaking the task) and communication (talking about the task) and almost certainly increased task performance time. Second, and perhaps as a consequence of the cognitive load, there were periods of silence with some participants as they undertook a task that required a high level of concentration, making it impossible to tell in real time if they were having problems. However, it was possible to later identify issues from their recorded mouse clicks so as to get a sense of confusion with interacting with the course content. A thorough evaluation of CTA methodology is beyond the scope of the present study, and although limitations of CTA are recognised, it presented a useful and economical approach to uncovering a number of usability issues that would otherwise have not been picked up during the design process.

Table 4.3

*Issues and remedial action taken based on participant responses to CTA usability testing.*

<b>Issue</b>	<b>Action</b>
Tabbing between registration fields not working.	Fixed so that fields tab in the right order.
'Captcha' text frustrating to read.	'Captcha' text changed to numbers, therefore making it easier to register whilst maintaining security.
Concern about course time commitment.	Stated more explicitly on website.
Confusion about reappearance of course promotion video after registration.	Removed and replaced by engaging image.
Some misunderstanding around purpose of "Mark Complete" button.	Video and help text created to explain progress and navigation through course.
Links on images.	Removed except for links to book chapters.
Text links are not obvious.	Link colour changed from grey to blue.
Uncertainty on how to prepare mental training program for upload.	Details added about recommended word processing program plus further instructions.
No certificate on final submission.	Certificate created and tested.
Progress bar in wrong position.	Progress bar moved to top of right hand column

***Site performance optimisation.*** Ahead of the launch date, some work was done to improve the rendering speed of webpages and therefore contribute to an improved experience. The site performance optimisation work included: a) compressing images to a smaller resolution without sacrificing quality using Photoshop image software, and b) turning off any unnecessary WordPress plugins.

**Stage 7: Launch.** *Elite Sport Performance: Psychological Perspectives* was launched globally on October 15, 2015. The course was licensed under a Creative Commons Attribution 4.0 International licence meaning that course content could be shared and adapted for any purpose providing that the licence owners (the course team) were given appropriate attribution. The licence is the least restrictive Creative Commons licence and was chosen because it would encourage greater dissemination of content and potentially give the learning materials the longest possible lifespan as they were remixed and repurposed by others according to future need.

***Promotion.*** The course was promoted as an informal taster course via channels that were targeted towards individuals with an interest in sport and sport psychology. A key method was to share a flyer (see Appendix K) on discipline related distribution lists. Bodies included the ASPASP Managing Council, the BPS Division of Sport & Exercise Psychology (DSEP), the APS College of Sport and Exercise Psychologists, and APA Division 47: Exercise and Sport Psychology. Members of distribution lists were encouraged to share the course through their own networks and beyond. Social media was also used to promote the course, primarily through Twitter and LinkedIn. Specific hashtags were created to assist in online discoverability and therefore help drive further sharing and included: *#sportpsychology*, *# sportpsychology #mentalskills*, *#MOOC*, *#OER*, and *#edtech*.

## Discussion

The purpose of this chapter was to address the research question: *What design features should be considered when building an open online course that focuses on supporting learner autonomy, competence, and relatedness?* It presented a methodical approach to the redevelopment of an open online course in sport psychology based on analytic data from a previous iteration of the course, a theoretical framework derived from self-determination theory, and best practice approaches in web design and online learning. The course creation process also drew upon the experiential knowledge and technical design expertise of the researcher and the subject expertise of the course convenor. A step-by-step approach that divided the design into pre-production, production, and post-production phases to a granular level was provided, which whilst iterative, aimed to articulate a design process that could be followed by others. The design of *Elite Sport Performance: Psychological Perspectives* was a significant piece of work taking an estimated 700 hours over a period of six months and resulted in an open online course accessible to anybody who wished to register. It was anticipated that the course would take a learner between 60 and 80 hours to complete, but true to its self-determination principles, was promoted as a course that learners could take in as little or as much time as they wished depending on their own volition and without external pressure.

The course ran between October 15 2015 and 8 March 2016. During that period, regular contact with the course team was provided through weekly emails, forum posts, and individual responses via the course comments page. The purpose of the communication was to keep learners informed of overall course numbers, to encourage discussion, to respond to any relevant questions or need for clarification, and to recognise progress and excellence. In general terms, the communication

approach taken aimed to support autonomy, competence, and relatedness in keeping with the self-determination framework outlined throughout this chapter.

Additionally, a course moderator from the University of Southern Queensland's Open Access College was on hand to participate in forum discussions and help with the co-construction of knowledge and foster a sense of relatedness.

The next chapter will present an empirical evaluation of the course. As briefly indicated earlier, research metrics were embedded directly into the course at different points. These will be described in detail and will include measures of intention, general causality orientation, and basic psychological needs satisfaction. Additionally, web analytic data will be presented to build a detailed picture of levels on engagement which not only act as a point of comparison with the data presented in Study 1, but also help to address the central research objectives posited at the beginning of this thesis.

**Chapter 5: Study 3 – Exploring Self-Determination and Course Engagement Characteristics of *Elite Sport Performance: Psychological Perspectives***

*Elite Sport Performance: Psychological Perspectives* was launched on October 15, 2015 and officially ran for approximately 20 weeks. The course duration allowed participants to have a reasonable period of time to engage with the course at their own pace and reduce potential time pressures that may thwart autonomy needs and therefore undermine intrinsic motivation. The course length was also optimal for collection of good quality web analytic data to provide insights into trends of online behaviour. This chapter presents the results and analysis of data collected for the open online course. The aim was to describe and evaluate the motivational and behavioural phenomena of those who registered for the open online course primarily using self-determination theory as a lens for enquiry. In addition to the web analytic data, measures related to continuance intention, causality orientation, and satisfaction of basic psychological needs were embedded into the course. Furthermore, post course data related to engagement and non-engagement were collected from participants who had registered for the course in the two weeks following the official close.

The chapter first provides details on participants including course registration numbers and response numbers to the measures embedded in the course. Second, detailed web analytic data are described that help to build a picture of activity and engagement and also act as a comparison to the web analytic data in Study 1. Third, reasons for taking the course coupled with continuance intentions are examined. Fourth, causality orientation measures are described and indexed against individual progress through the course. Fifth, levels of basic psychological needs satisfaction are investigated among those who completed the course to identify any possible changes as learners moved through the course. Sixth, self-reported measures of

intrinsic motivation and its associated characteristics are described to help further evaluate the attributes of the course. Finally, self-report data examining reasons why people did not engage with the course are provided.

The following research questions were addressed in this chapter:

1. *What patterns of activity and engagement were present in the course and how do such patterns compare to the first iteration?*
2. *What were the demographic and intentional characteristics of the learners and did these characteristics have any associations with engagement?*
3. *Does motivational orientation (general causality orientation) predict course progression in the context of this open online course?*
4. *For those who completed the course, do levels of basic psychological needs satisfaction (autonomy, competence, and relatedness) significantly increase during the duration of the course?*
5. *What qualities determined engagement or non-engagement in the course?*

Two hypotheses were tested, which relate to research questions 3 and 4:

1. *In the context of an open online course, course progression will be greatest in autonomy-oriented learners.*
2. *Scores for basic psychological needs satisfaction (autonomy, competence, and relatedness) will significantly increase over the duration of the course.*

## **Method**

**Participants.** Participants were individuals who registered for the course between October 2015 and March 2016. As indicated in the previous chapter, they were predominantly recruited via professional mailing lists such as the BPS Division of Sport & Exercise Psychology (DSEP). Additionally, social media platforms including Twitter and LinkedIn were utilised to promote the course more widely.

Web analytics, described in detail later, provided evidence to suggest that Facebook played a role in the recruitment of participants as information about the course was shared across personal social networks even though it was not directly utilised by the course team for marketing purposes.

Registering and then enrolling for the course was a two-step process. First, individuals would visit the web address [elitesportpsy.org.au](http://elitesportpsy.org.au) and register using their name and email address. Second, having been provided with further information about the course content, they would click on a button titled *Take This Course*.

During the course period of approximately 20 weeks, 1,007 individuals registered for the course of which 745 individuals went on to enrol. Figure 5.1 provides an overview of registrations and enrolments over time, and it can be seen that there was a large influx of registrations in the first week of the course.

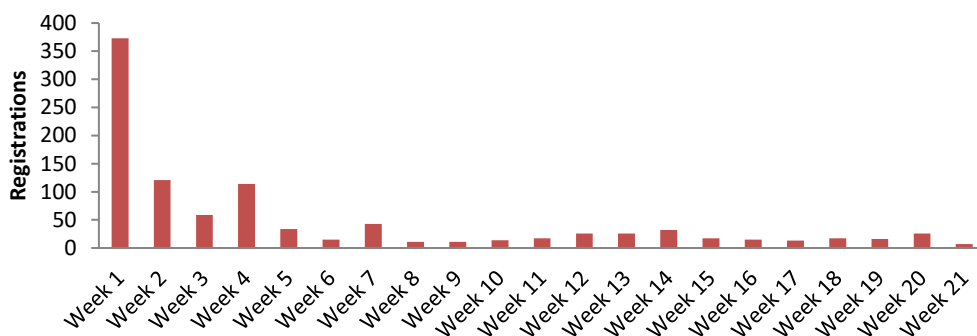


Figure 5.1. Course registrations for *Elite Sport Performance: Psychological Perspectives* over time ( $N = 1,007$ ).

Once participants had enrolled on the course, they were presented with an introductory video that expanded on the course content and also provided further information about the evaluation research running in tandem with the course. From here, demographic data and reasons for taking the course and continuance intention were collected via a short questionnaire titled *Your Reasons for Taking this Course*. Following this step, they would complete each module in sequence, unlocking new



content as they progressed. A total of 345 participants responded and describe a representative mix of those who registered for course. Web analytics when segmented specifically to course page access (as opposed to the whole website) described an international mix of participants from 73 countries. The ten most represented countries in order of recorded sessions, were Singapore, United States, Malaysia, Taiwan, Australia, United Kingdom, India, Greece, Brazil, and Iran.

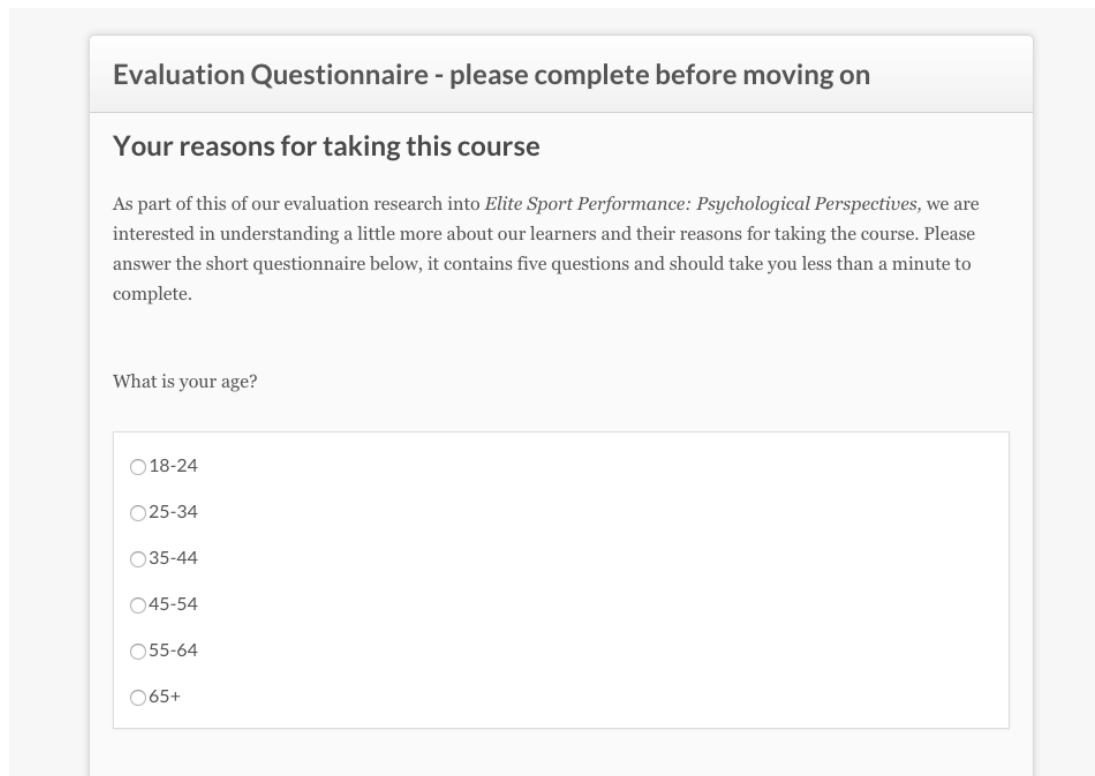
Table 5.1 provides a profile of the 345 course participants who began the course and subsequently responded to the survey. It can be seen that there were 58.6% males and 41.4% females. The largest proportion of learners were in the 25-34 years age group and the vast majority were university educated, with 46.7% expressing that they were educated to postgraduate level. A degree of caution should be taken when considering this figure, given that web analytics suggested a global cohort of learners and therefore undergraduate and postgraduate qualifications may not be equivalent in different countries. Nevertheless, a large proportion of the participants (80.3%) reported that they were educated to a tertiary level or beyond.

**Materials and measures.** The measurement tools used to collect evaluative data were administered exclusively online and were integrated into the experience of taking the course. More specifically, WordPress and LearnDash acted both as an administrative platform for data collection and also facilitated the embedding of research measures directly into the course experience as learners progressed through the course. LearnDash in particular has quiz features, which are generally utilised as course assessment, whether formal or informal, but for this study were repurposed and embedded into the course experience. All instruments are presented in Appendix L and Figure 5.2 illustrates an example of how an embedded questionnaire appeared to participants.

Table 5.1

*Profile of course participants (N = 345)*

Variable	<i>n</i>	%
<b>Sex</b>		
Male	202	58.6
Female	143	41.4
<b>Age Group</b>		
18-24	67	19.4
25-34	152	44.1
35-44	59	17.1
45-54	43	12.5
55-64	19	5.5
65 and over	5	1.4
<b>Education</b>		
Less than high school	3	0.9
High school graduate	32	9.3
Vocational or foundational qualification	33	9.6
Undergraduate degree	116	33.6
Postgraduate degree	161	46.7



**Evaluation Questionnaire - please complete before moving on**

**Your reasons for taking this course**

As part of this of our evaluation research into *Elite Sport Performance: Psychological Perspectives*, we are interested in understanding a little more about our learners and their reasons for taking the course. Please answer the short questionnaire below, it contains five questions and should take you less than a minute to complete.

What is your age?

18-24

25-34

35-44

45-54

55-64

65+

*Figure 5.2.* Screen capture of questionnaire embedded directly into the course.

In addition to WordPress, Google Analytics acted as an application to collect online activity and engagement data. The nature of Google Analytics has been described in detail in Chapter 3 and so only the relevant metrics taken will receive mention in this chapter.

***Participant profile, reasons for taking course, and continuance intention.***

A short questionnaire titled *Your Reasons for Taking this Course* was developed to capture some basic demographic data, reasons for taking the course, and continuance intentions. Through a series of closed ended questions, participants were asked to provide information on age group, gender, highest level of educational achievement, and reasons for enrolling on the course. In addition, an item on continuance intention was added and was based upon the same item used in a survey of 79,525 MOOC participants across eight HarvardX courses (Reich, 2014). In that particular study, the item was added with the purpose of better understanding possible reasons why

MOOC completion rates were so low when compared to traditional courses. In the context of this course the item was used to measure the interaction between continuance intention and course progression.

***General Causality Orientations Scale (GCOS).*** The General Causality Orientations Scale (GCOS; Deci & Ryan, 1985a) captured individual measures for the three causality orientations articulated in causality orientation theory, specifically: autonomy, control, and impersonal orientations. The GCOS contains 36 items split into 12 three-item vignettes and has been extensively used in a range of contexts including experimental psychology, work settings, medicine, and sport and exercise science. An example vignette is as follows: *You have been offered a new position in a company where you have worked for some time. The first question that is likely to come to mind is:* Respondents would then self-report on a scale from 1 to 7 on each causality orientation. Thus in the vignette above, participants would score themselves on (a) *What if I can't live up to the new responsibility?* (b) *Will I make more at this position?* and (c) *I wonder if the new work will be interesting.* Item (a) corresponds to the impersonal orientation, item (b) pertains to the control orientation, and item (c) is relevant to the autonomy orientation. The other 11 vignettes also contain the three causality orientations in random order.

In the original validation paper, the scale yielded acceptable reliability (a mean Cronbach's alpha coefficient of .73) and temporal stability (mean test-retest validity of .75 over a 2-month period). Additionally, the authors reported relative independence of the constructs in relation to each other so for example the autonomy orientation subscale was unrelated to the control orientation subscale ( $r = .034$ ). The scale also provided good convergent and discriminant validity with other items from other scales. For example, there was a strong correlation between the impersonal

orientation subscale and Rotter's Locus of Control Scale. Finally, when investigating causality orientations in a clinical population, Cooper, Lavaysse, and Gard (2015) were able to replicate similar psychometric properties for an adapted version of the scale titled the GCOS-CP.

In this study the scale was used to ascertain the extent to which learners were predominantly autonomy- or control-oriented (see Hagger et al., 2015; Koestner & Zuckerman, 1994), and whether this predicted course progression.

***Basic Psychological Needs in Open Online Education Scale (BPNOOES).***

The Basic Psychological Needs in Open Online Education Scale (BPNOOES) is an adapted version of The Basic Needs Satisfaction in Exercise Scale (BPNES; Vlachopoulos & Michailidou, 2006), and measures perceived satisfaction of the basic psychological needs of autonomy, competence, and relatedness. The translated English version of the BPNES contains 11 items as opposed to 12 items in the original Greek version (see Vlachopoulos et al., 2010), with four items mapping to autonomy and competence respectively, and three items corresponding to relatedness. Evidence to support the validity and reliability of the scale has been cited by Vlachopoulos et al. (2013) with a number of validation studies including scales translated into English, Turkish, Portuguese, Spanish, and Chinese. Each study has confirmed the three-factor structure of autonomy, competence, and relatedness (e.g., Liu et al., 2013; Moutão et al., 2012; Vlachopoulos & Michailidou, 2006; Vlachopoulos et al., 2010). The BPNES has acceptable reliability with a mean Cronbach's alpha coefficient of .79 across the three constructs (Vlachopoulos et al., 2013).

The BPNES is one of a suite of scales that measure basic psychological needs satisfaction across a range of life domains. It was selected for the present study not

only because of its good psychometric properties, but also because of all the validated needs satisfaction scales, the exercise context provided the closest fit to the open online learning context. In adapting the tool, the wording of the BPNES was changed within each of the items to reflect an open online education environment, and is therefore referred to as the BPNOOES. Item 9 of the BPNES for example which measures perceived efficacy in meeting a challenge, presents the participant with the statement: *“I am able to meet the requirements of my exercise program”*, has been changed in the BPNOOES version to: *“I am able to meet the learning requirements of this course”*.

**Survey responses.** Reasons for taking the course, continuance intention, causality orientation, and basic psychological needs satisfaction data were collected over the lifespan of the course with participants responding at specific points in the course. Questionnaire response numbers were dependent on a) how deeply a participant progressed into the course, and b) whether a participant decided to respond to the questionnaire given that it was not an inherent requirement to progress through the course (in keeping with self-determination theory design principles). Additional self-report data were collected after the course officially ended in order to provide further illumination on engagement and non-engagement and is discussed separately in this chapter. Figure 5.3 provides a breakdown of the response numbers for each instrument.

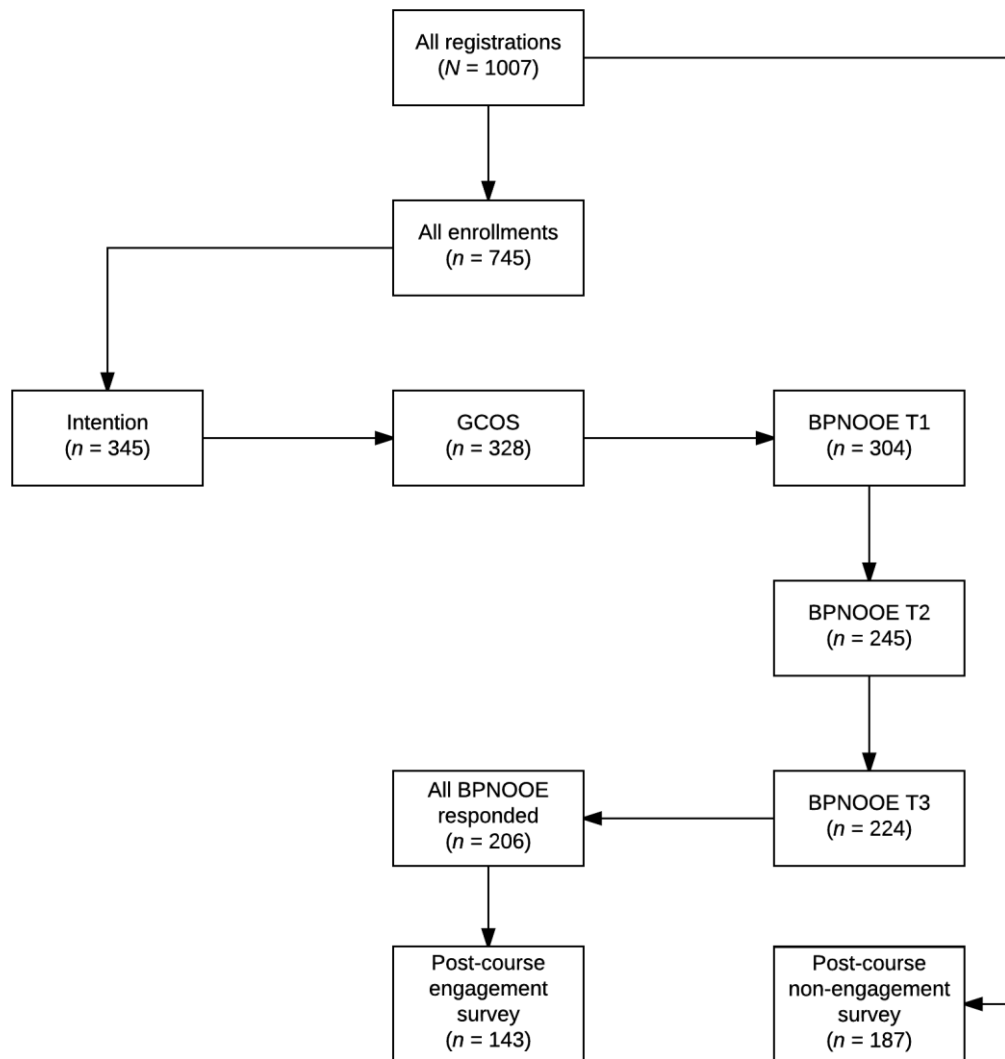


Figure 5.3. Response numbers for each survey.

**Web analytic measures.** As indicated in the previous chapter, Google Analytics code was embedded into each webpage during the design of the course.

Measures recorded included:

*Number of sessions.* The total number of sessions in a given period, a session being an interaction or set of interactions with a website during a single visit.

*Number of users.* The total number of users visiting the course website, a user being equivalent to an individual visiting a website once or multiple times by reference to a cookie identifier.

*Pageviews.* The total number of pages viewed over a given time period.

*Entrance.* The incremented number of pages that were the first point of access on entering the website.

*Pages per session.* The mean number of pages visited in a given session and therefore a measure of engagement with a higher score representing increased engagement.

*Session duration.* The amount of time spent interacting with the course website before leaving. A higher mean time representing increased engagement.

*Bounce rate.* The percentage of single page visits to multiple page visits. In general terms, a lower bounce rate represents increased engagement.

*New vs. returning visitor.* The number of new users compared to those who have returned to the website expressed as a percentage. This proportion gives an indication of the website's "stickiness" (see Lin, 2007); i.e., the retention of users over time and therefore an indication of engagement.

*Location.* The geographical location of users who accessed the course website by country.

*Access device.* A quantitative description of the access agents used to visit the course website e.g., mobile, desktop, and tablet devices.

*Acquisition.* A quantitative description of where visitors accessed the course. For example, some users accessed the website directly where as others may come via a web link external to the course website.

*Content.* A quantitative description of the most accessed webpages on the course website to give an indication of engagement patterns.

*Behaviour flow.* An overview of user navigation through the course website.



*Course data derived from LearnDash.* The LearnDash plugin, which organised and administrated the course, has a number of tools to measure course engagement. For the purposes of this study, the following data were collected:

- Registration date.
- Course progress as measured by completed modules.
- Number of mental training programs submitted.
- Number of forum posts made.

*Post course data.* Following the official closure of the course on 8 March 2016, some follow up data were collected using an online survey tool called Qualtrics to shed further light on course engagement. Qualtrics is a commercially available tool that facilitates the creation, administration, email distribution, and collection of online surveys. Two surveys were created and ran over a three-week period from 17 March to 6 April 2016. The first survey was administered to course participants who deeply engaged with the course and the second to those who had limited or no engagement.

*Intrinsic Motivation Inventory (IMI).* The first measure aimed exclusively at engagers, examined the subjective experience of taking the course using items from the Intrinsic Motivation Inventory (IMI; Plant & Ryan, 1985; Ryan, 1982). The IMI takes measurements of constructs related to intrinsic motivation across seven subscales, specifically: interest and enjoyment, perceived competence, effort and importance, pressure or tension, perceived choice, and value and usefulness. Two items from each sub-scale were selected and randomised before being distributed via Qualtrics. The IMI is a flexible and widely used tool in studies examining intrinsic motivation in a number of innovative experimental contexts (e.g., Hanus & Fox, 2015; Tas, Brown, Esen-Danaci, Lysaker, & Brüne, 2012). The instrument has a

mean internal consistency of .85 as measured through a Cronbach's alpha reliability coefficient (McAuley, Duncan, & Tammen, 1989). Items were adapted slightly in accordance with the IMI guidelines attached to the scale to better fit the open online course context (See Appendix L). For example, the interest and enjoyment item "*I enjoyed doing this activity very much*" was modified to "*I enjoyed doing this open online course very much*". In addition to the 14-item instrument, an open-ended question was added that asked participants to provide additional feedback on the course if they wished to do so.

*Non-engagement questionnaire.* As described in greater detail later in this chapter, some participants did not engage with the course. A single item questionnaire was created to examine the reasons for not participating in the course and distributed to those individuals via Qualtrics. In addition, an open-ended question asking participants to elaborate on their reasons if they wished was added.

**Procedure.** Ethical approval was received from the University of Southern Queensland Office of Research, Human Research Ethics Committee (Approval No. H15REA007; see Appendix M). As previously indicated, the course was launched on 15 October 2015 and promoted to potential participants through a range of channels. On registration, participants received an automated email welcoming them to the course (see Appendix N) and notified them about the research evaluation. In addition, further information including a downloadable participant information sheet (see Appendix M) was available from the course website. Learners were then free to engage with the course at their own pace at a time that suited them.

The measures relating to demographics, reasons and intentions, causality orientations, and basic psychological needs satisfaction were embedded into the course at fixed points to be responded to as the learner progressed. The intention and

GCOS questionnaires were placed at the very start of the course and were deployed once only. Meanwhile, the BPNOOES scales were embedded at the following points in the course: at the end of the introducing psychological skills module early in the course (T1), at the mid-point of the self-confidence module in the middle of the course (T2), and after the group dynamics module towards the end of course and just before the summative mental training program activity (T3). In accordance with the design ethos of the course, it was not a requirement for learners to respond to questionnaires if they did not wish to, which would have prevented their progress. However, once a questionnaire was completed, it could not then be responded to again. All responses were stored in LearnDash as database files and were later exported for analysis after the course had officially completed. Figure 5.4 presents a screenshot of how the third BPNOOES was presented to learners.

- Clarifies direction and purpose.
- Inspires enthusiasm and commitment.
- Bridges the present and future.
- Is clear and easy to understand.
- Is ambitious.

**A supportive environment**

A supportive environment where team members, whatever their role, feel supported by team mates and coaching staff helps the group to excel. A key challenge is to develop healthy rivalries where players compete for selection with a view to making the team better rather than for individual gain. At the same time, all players should be willing to offer support to team mates when injury, non-selection, or other adverse scenarios arise. An important characteristic of a supportive environment is a "no blame" policy, whereby the team always takes collective responsibility for outcomes, good or bad, rather than attributing mistakes to any individual, .

**In-game communication**

During game play, clear and concise communication, both verbal and non-verbal, is vital to a team's success. Team meetings to address communication issues are important to ensure that all players are made aware of the team "playbook," and what each call means for them as an individual. Every team member will have personal likes and dislikes for what team mates might communicate during a game, and it's helpful to share these among all involved. **Simulation training** can be an effective way to ensure that everybody understands patterns of play and the communication that goes with them.

*Jon Montgomery. Image credit: thelastminute. (cc) BY-NC-SA*

**Evaluation Questionnaire - please complete before moving on**

**Meeting your motivational needs 3**

The following sentences refer to your overall experiences in open online educational courses such as this one (as opposed to any particular situation).

Using the 1-5 scale below, please indicate the extent to which you agree with these statements by choosing one number for each statement.

I don't agree at all   
 I agree a little bit   
 I somewhat agree   
 I agree a lot   
 I completely agree

1                      2                      3                      4                      5

The questionnaire contains 11 items and will take you 1-2 minutes to complete.

**START**

Figure 5.4. Screenshot of BPNOOES embedded into the course illustrating how data were collected as learners progressed.

At the completion of each topic, participants clicked on a button to mark the page as complete, and this information was recorded as course progress for each individual learner in LearnDash. An overview of individual course progress in real time was viewable to the course team via an administrative dashboard called LearnDash ProPanel (see Appendix N). Through this dashboard, regular updates from the course team (fortnightly on average) were sent out to all enrolled learners. Information included updates on course numbers and recognitions of excellence, such as insightful contributions on the forums or good quality mental training program submissions.

The course team moderated the course discussion forum (see Appendix N for example posts), with occasional contributions from the course convenor to lend an expert voice and stimulate discussion. The forum also acted as a space to share all uploaded mental training programs, which as discussed in the previous chapter, was the final course activity. Those learners who completed this activity were able to download a personalised certificate of completion with their name automatically added to it through scripting in the LearnDash system.

The course officially ended on 8 March 2016, some 145 days after the course was initiated. All data were exported from LearnDash as CSV files and imported into Excel and SPSS as necessary for further analysis. After a short period of maintenance, the course content was made available again as an OER, in accordance with its Creative Commons licence. In practice this meant that anybody could reuse and repurpose content as long as they credited the course authors. Google Analytics data had been collected throughout the lifespan of the course to provide insights into online activity. At the end of the course, reports were generated via the Google Analytics Dashboard for later analysis. Some extra data were also collected after the

official closure of the course in anticipation of shedding further light on the experience of participants taking the course. The procedure for the post-course survey will be detailed later in the chapter.

## Results

At the official closure of *Elite Sport Performance: Psychological Perspectives*, a total of 1,007 participants had registered and of that total 745 enrolled on the course. Figure 5.5 provides an overview of course progression as measured by the LearnDash platform. It can be seen that exactly 200 participants completed the course and submitted a valid mental training program, representing a completion rate of 20%. These participants had completed all modules in sequence before submitting their program. A further 71 participants reached the end of the course, but did not submit a mental training program. If this figure is included, the course completion rate rises to approximately 27%. It can also be seen that 495 participants did not engage with course at all, that is to say did not progress to the *Welcome to the Course* page, which represents approximately 49% of all course registrants. In total 241 (or 24%) participants fell somewhere in the middle, or more specifically, engaged with the course to some extent without completing the course. These participants range from those who completed the *Welcome to the Course* ( $n = 115$ ) to those who completed the later modules of *Concentration*, *Imagery*, and *Music* ( $n = 14$ ) and therefore it can be assumed engaged to a significant level before dropping out.

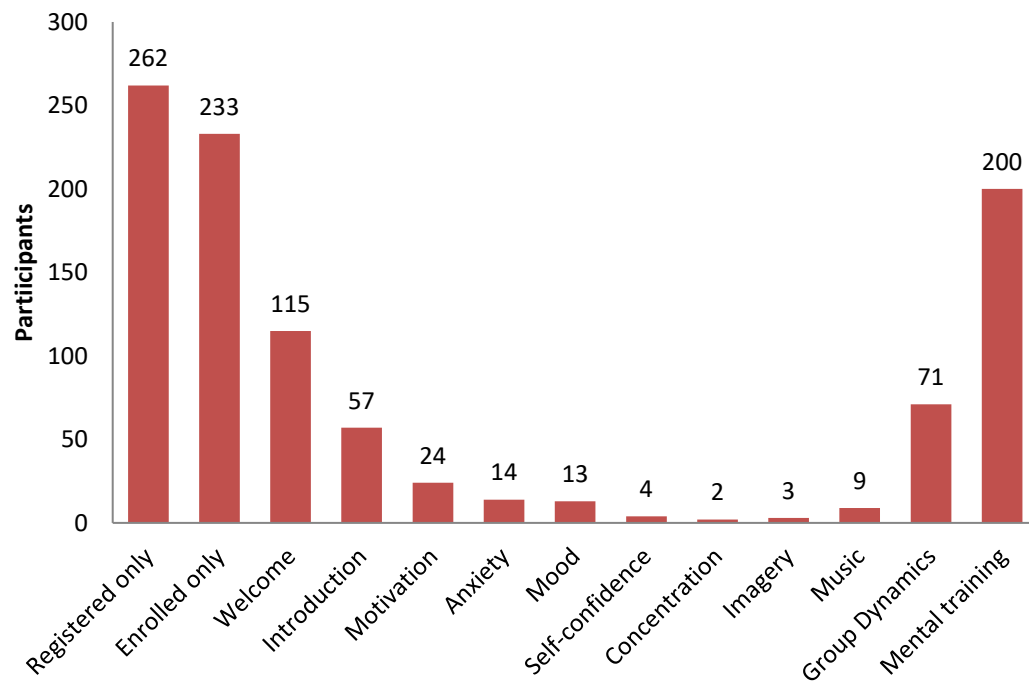


Figure 5.5. Course progression as measured by number of participants completing each module ( $N = 1,007$ ).

As an addendum to these figures, using a benchmarking metric proposed by Jordan (2014) in which completion rates are calculated as the proportion of those learners who completed the course against the total number of learners who actually engaged with some learning content (as opposed to doing nothing), the completion rate is much higher. If an engager is defined as a learner who completed at least the introduction module, that is the first learning module, then the completion rate rises to just over 50%. If those learners who almost finished the course are taken into account, that is those who completed all modules but did not upload a mental training program, the completion rate is 68%.

**Describing activity and engagement.** Further information regarding course activity is provided below and intended to help build a picture of course engagement.

**Mental training programs.** As described above, 200 participants submitted mental training programs over the duration of the course. The mean time from course

enrolment to mental training program submission was 63 days ( $SD = 45.6$  days), with a minimum time of 1 day and maximum time of 145 days indicating a variety of completion times.

**Discussion posts.** In total 251 participants made at least one forum post contribution. In sum, there were 808 forum post contributions (not including mental training program shares), of which the maximum number of postings by a single individual was 15. The mean number of posts of this sample of participants was 3.2 ( $SD = 3.4$ ).

**Google Analytics data.** Google Analytics data were cleaned up to remove all referrer spam data, using an updated version of the referrer spam filter used in Study 1. The filter was again provided for free by Loganix, and removed traffic from known non-credible sources, and therefore created a subset of data without sessions from those sources. In practice, this filtered out around 10% of all online sessions, approximately 2,000 pageviews, and 1,000 sessions.

Table 5.2

*Overview of activity and engagement with course as measured by Google Analytics*

*15 October 2015 - 8 March 2016*

<b>Measure</b>	<b>Value</b>
Time (days)	145
Sessions	12,369
Pageviews	84,723
Unique pageviews	54,506
Total users	3,673
Mean pages per session	6.85
Mean session duration (min:sec)	12:22
Bounce rate (%)	37.9%
New users (%)	29.7%
Returning users (%)	70.3%

Table 5.2 provides an overview of engagement with the course website and includes both the course promotion pages and actual learning content. It can be seen that there were nearly 85,000 pageviews during the 20 week course and that returning visitors predominated over new users in accessing the website.

Furthermore, the mean time for engaging with the website was 12 minutes. It should be noted that these data include those users who did not register for the course, who may have shown interest, but ultimately did not create login credentials. Table 5.3 below presents data, which has been filtered to include only those sessions in which participants engaged with the actual course content. This was achieved by adding a new segment in Google Analytics, which only included sessions in which participants had visited the course homepage, the first point of contact with the course following each login. This data pertains to 41% of all sessions but accounts for approximately 75% of traffic to the whole website.



Table 5.3

*Overview of engagement with course pages only, as measured by Google Analytics*

*15 October 2015 - 8 March 2016*

<b>Measure</b>	<b>Value</b>
Total sessions	5,681
Total pageviews	64,313
Total users	1,774
Mean pages per session	11.32
Mean session duration (min:sec)	19:42
Bounce rate (%)	13.73%
New users (%)	26.6%
Returning users (%)	73.4%

The filtered data indicates that learners spent on average nearly 20 minutes in the course website before leaving. These data include all course registrations for the website and therefore the whole gamut of learners, from those who did not participate at all, to those who completed the course. On average, approximately 11 pages were visited for each session. This data would likely include visiting the website homepage, the login screen, and course homepage before then going on to engage with course content and online discussion forums. It can also be seen that approximately 73% of users returned to the course as identified as returning visitors by Google Analytics. Finally, the number of users recorded was 1,774, a figure greater than the 1,007 course registrations. The most likely reason for this large discrepancy is that some users visited the course more than once using multiple devices, remembering that a user is actually represented by a cookie placed in their browser that Google Analytics tracks. For example, a single individual may have accessed the course at different times using their mobile device on one occasion and their laptop on another, yet counted as two users by Google Analytics.

*Activity throughout the duration of the course.* The following analytic data describes various engagement and activity metrics over the duration of the course. Two measures are shown in each instance, one pertains to the sessions across the whole website and the other solely to sessions in which the course was accessed. Where possible, figures are compared to benchmarks provided by Google Analytics. These benchmarks are aggregated figures taken from a specific sector or industry and for this study, education has been chosen as the closest point of comparison. For further information on benchmarking, see Waisberg (2014).

*Pageviews over time.* Figure 5.6 describes the pageviews over time, both for all sessions on the website, and for those sessions in which the course was accessed. There are a number of peaks and troughs, but generally activity was sustained for the duration of the course, with a slight increase towards the end. The largest peak in activity came in the first week of the course and can be explained by traffic being driven to the website from various promotional channels. This period also represents the largest gap between those who interacted with course content and those who did not, or put differently, a period in which many browsed the course but chose not to register. Daily activity on the second iteration of *Elite Sport Performance*:

*Psychological Perspectives* when compared to its first iteration run in 2013 was greater by almost a factor of ten. When comparing daily pageviews, the second iteration received a mean of 582 pageviews per day for the 145-day course, whereas the first iteration received a mean of 59 pageviews per day for the 43-day course.

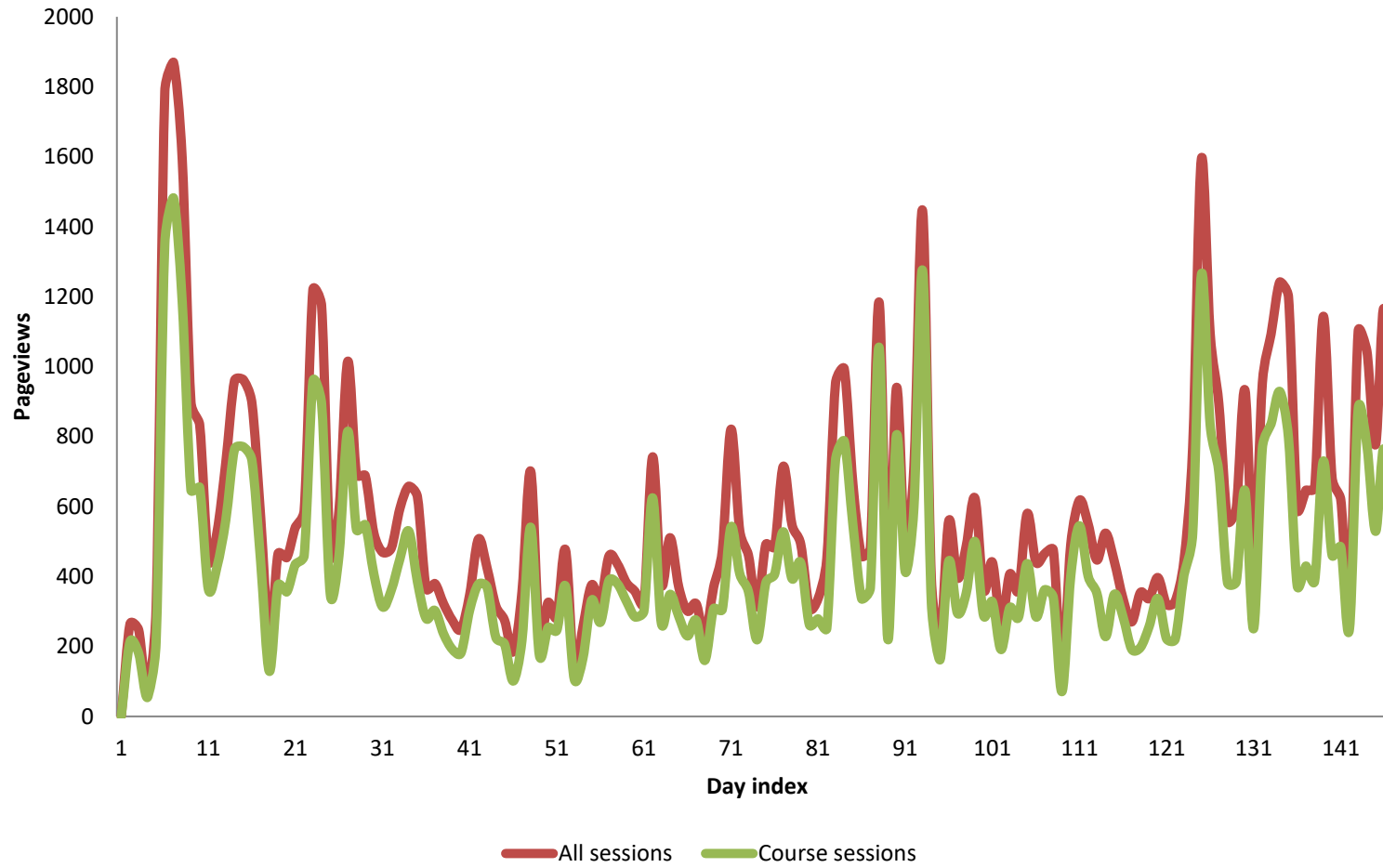


Figure 5.6. Pageviews over time as recorded by Google Analytics.

*Session duration over time.* The time spent interacting with the course is shown in Figure 5.7. The chart describes the mean session duration per week for both the whole website and for those sessions in which only the course was accessed. The session duration statistic indicates sustained and strong engagement throughout the lifespan of the course. Google Analytics provides a benchmarking tool to allow a website owner to compare the performance of their website against industry means (see “About Benchmarking”, n.d.). As a comparison using this tool, the mean session duration for educational websites is 2 minutes and 14 seconds (with 266,298 websites contributing to the benchmark), whereas for *Elite Sport Performance: Psychological Perspectives* course content, it was 19 minutes and 42 seconds. Furthermore, this time exceeds the original iteration of the course, which was 7 minutes and 13 seconds during its lifespan of 43 days.

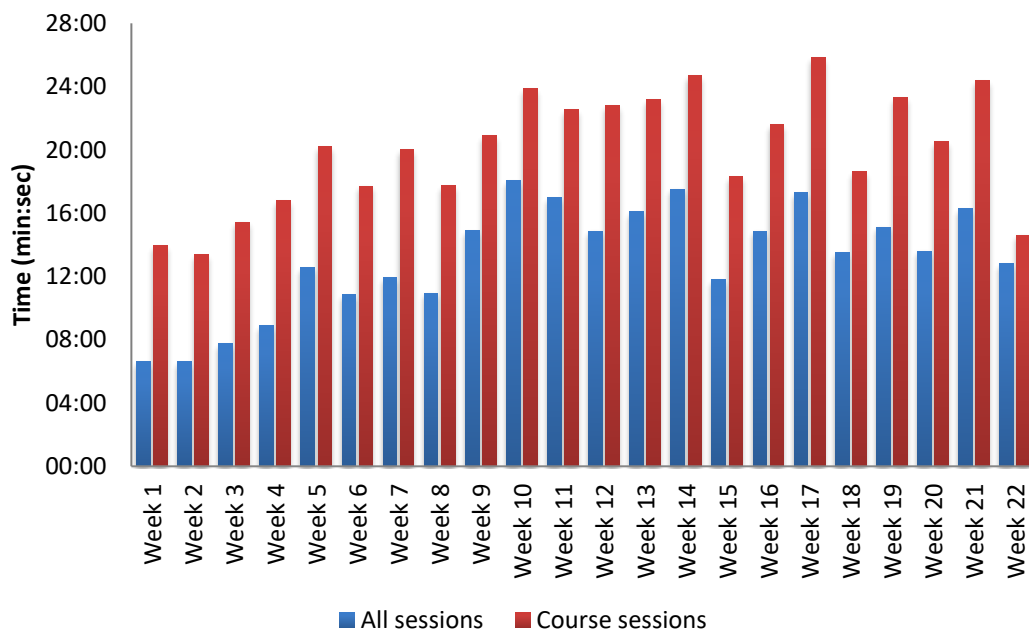


Figure 5.7. Mean weekly session duration time during lifespan of course.

Table 5.4 below describes the breakdown of times for sessions and number of pageviews for all course sessions and illustrates some deep engagement. For

example 1,308 page sessions were in the range of six minutes to half an hour in which 15,476 pages were viewed.

Table 5.4

*Breakdown of session durations (course sessions only)*

<b>Time range (min:sec)</b>	<b>Sessions</b>	<b>Pageviews</b>
0:00 – 0:10	828	879
0:11 – 0:30	177	500
0:31 – 1:00	272	1082
1:01 – 3:00	652	3444
3:01 – 6:00	1125	8899
6:00 – 30:00	1308	15476
> 30:01	1319	34033

*Bounce rate over time.* At 37.9%, the mean bounce rate for *Elite Sport Performance: Psychological Perspectives* generally remained within acceptable levels throughout the course, i.e., below 40%. Figure 5.8 illustrates the bounce rate for the duration of the course, both for the whole website and for course sessions only. There is some evidence to suggest that bounce rate marginally improved over time, possibly due to a greater proportion of returning visitors engaging with the course. When taking into account course pages only, the bounce rate is below 14% on average for 5,681 sessions, which according to web analytics specialist Kaushik (2007) is exceptional. As a point of comparison and according to Google Analytics benchmarking tool, education websites have an average bounce rate of approximately 60%, suggesting that the course has performed well in terms of engagement. The first iteration of the course had a bounce rate of 38% across 389 sessions, so it also performed well in comparison to the benchmark for online education courses.

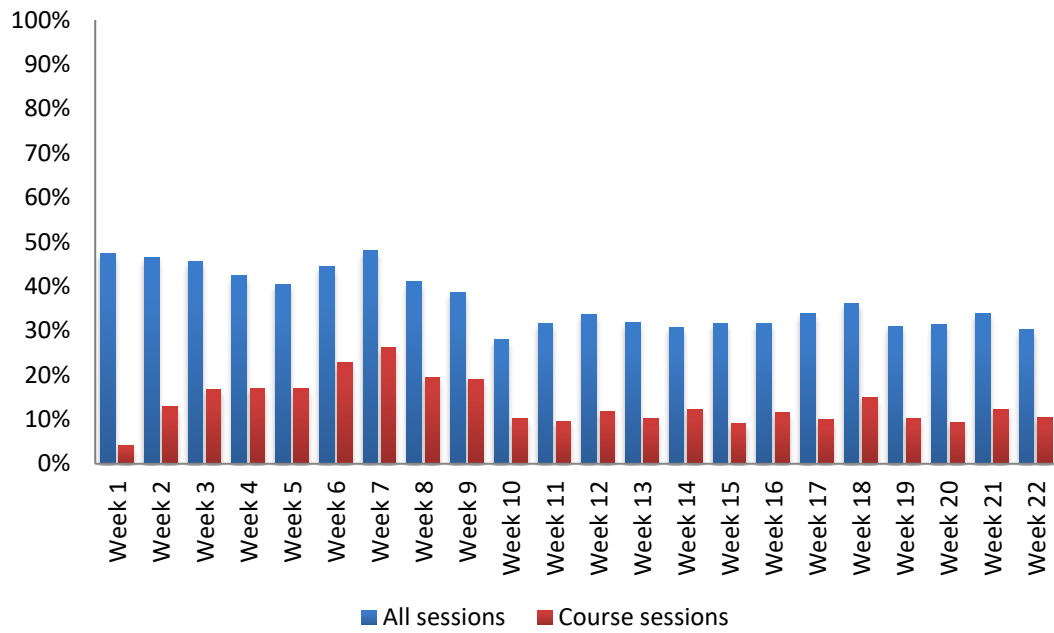


Figure 5.8. Mean weekly bounce rate for lifespan of course.

*Pages per session over time and new vs. returning visitors.* The mean number of pages viewed per session as illustrated in Figure 5.9 below, remained relatively constant and slightly trended upwards as time progressed. This can be at least partially explained by the data provided in Table 5.5, which describes how the proportion of new vs. returning visitors shifted over time, with returning visitors likely to engage with more pages than new visitors.

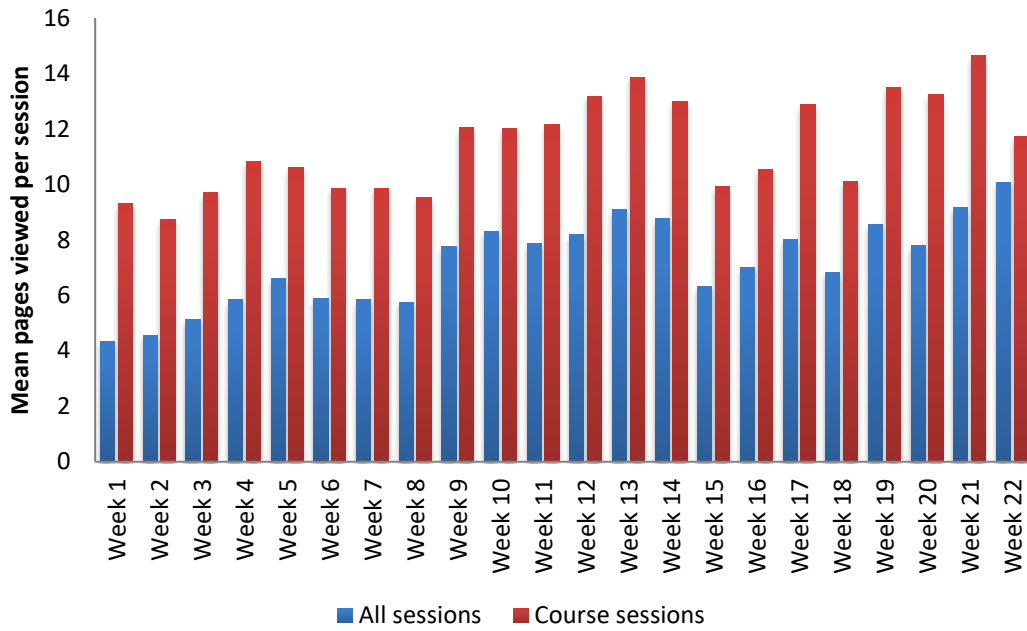


Figure 5.9. Mean number of pageviews per session over lifespan of course.

Table 5.5

*New vs. returning visitors 15 October 2015 - 8 March 2016*

Month	Percentage New Visitors	Percentage Returning Visitors
October 2015 (16 days)	56.9%	43.1%
November 2015	30.6%	69.4%
December 2015	18.8%	81.2%
January 2016	19.0%	81.0%
February 2016	18.5%	81.5%
March 2016 (8 days)	16.5%	83.5%

Over time it can be seen that the number of new visitors declined. This is possibly because the course was only promoted once at the beginning of the course and therefore the number of potential new participants reduced as the time from the course promotion cycle increased. Indeed, the number of course registrations recorded by LearnDash did dramatically slow over time as was evidenced earlier in this chapter in Figure 5.1.

**Content.** In total over 800 different pages of content were accessed on the *Elite Sport Performance: Psychological Perspectives* website. Most of the traffic

was pertinent to course pages including module and topic content, although there were also many dynamically generated pages that included discussion forum pages and individual profile pages. The 10 most accessed pages are described in Table 5.6.

Table 5.6

*Most accessed webpages 15 October 2015 - 8 March 2016*

<b>Rank</b>	<b>Page Title</b>	<b>Pageviews</b>	<b>Unique Pageviews</b>	<b>Entrances</b>
1	Course homepage	11256	5681	1775
2	Website homepage	8646	6455	5878
3	Login page	3671	2669	245
4	<i>Introducing Psychological Skills</i>	2533	1374	144
5	<i>Motivation</i>	2497	1405	106
6	<i>Course Welcome</i>	2345	1219	145
7	Registration page	2247	1530	184
8	<i>Anxiety</i>	1999	978	199
9	<i>Build a Mental Training Program</i>	1946	1048	82
10	<i>Self-confidence</i>	1463	841	38

The table above describes the number of pageviews, unique pageviews, and entrances for each page. As described in Chapter 3, a unique pageview is recorded only once per page per session irrespective of the number of times that page was visited in that session. For example, a user may go to the course homepage, visit a module and then, return to the course homepage before moving on to the next module, although in relation to the course homepage, Google Analytics would record two pageviews, but only one unique pageview.

The numbers suggest that the course homepage was often accessed multiple times during a session and is demonstrated by the difference between the number of pageviews and unique pageviews. This disparity can partially be explained by the inbuilt functionality in LearnDash, which would return the learner to the course homepage once they had completed a module. There is also the strong possibility that some participants either bookmarked this page or it was the page that their



browser pointed to first when they visited the site again as evidenced by the corresponding value for entrances. An entrance is a score for the first page accessed during an online session. Browsers such as Chrome often predict pages when typed into the address bar, providing a useful short cut to content and 1,775 entrances were recorded for the course homepage. The majority of users did enter the site through the website's homepage with 5,878 entrances through this route, although over 3,000 entrances were cumulatively recorded for other pages, suggesting that some users left their webpages open only to return later and start a new session (and therefore record a separate entrance). Perhaps a general observation from these figures is that engagement behaviour is complex and unpredictable. To illustrate this point, Appendix O presents a behaviour flow diagram downloaded from Google Analytics illustrating how users navigated through the website.

*Access characteristics.* Google Analytics data provided useful information about how and where users were accessing the course website. Some summary data is presented below.

*Access device.* Approximately three quarters of all sessions came through a desktop computer, with other access coming through mobile phones and tablets.

Table 5.7 offers a breakdown of these figures.

Table 5.7

*Device access characteristics (all sessions) 15 October 2015 - 8 March 2016*

<b>Device type</b>	<b>Sessions</b>	<b>% New sessions</b>	<b>New Users</b>	<b>Bounce Rate</b>	<b>Pages per session</b>	<b>Mean session duration (min:sec)</b>
Desktop	9095	23.98%	2181	30.63%	7.72	14:24
Mobile	2611	47.26%	1234	60.21%	4.13	6:12
Tablet	663	39.52%	262	49.77%	5.61	8:15

The figures for mobile devices describe briefer periods of access with reduced activity in comparison to desktop devices. The measurements for pages per session and mean session time are much lower for mobile than desktop, meanwhile bounce rates and percentages of new sessions are proportionately higher. One possible explanation for these figures is that many users access the website for the first time via mobile, perhaps after receiving some promotional information, many of whom either never return to the website or access the site later with a different device type. If these figures are segmented to show sessions that only include accesses to the course (and therefore indicate course engagement), the measures tell a slightly different story (Table 5.8).

Table 5.8

*Device access characteristics (course sessions) 15 October 2015 - 8 March 2016*

<b>Device type</b>	<b>Sessions</b>	<b>% New sessions</b>	<b>New Users</b>	<b>Bounce Rate</b>	<b>Pages per session</b>	<b>Mean session duration (min:sec)</b>
Desktop	4563	22.68%	1035	10.26%	11.86	20:55
Mobile	838	44.51%	373	30.19%	8.70	13:49
Tablet	280	37.50%	105	21.07%	10.40	17:28

The proportion of desktop accesses is much higher (approximately 80%) with engagement metrics across all devices significantly greater. It may also be noted as a point of comparison that that mobile and tablet traffic on the original course was approximately 5%, whereas this iteration of the course sits at approximately 20%. The leading mobile device types were Apple (45%) and Samsung (29%), with a range of other devices making up the rest of the figures. The main operating systems used to access the course were Windows (61%), Mac OS (19%), Android (10%), iOS (9%), and others (1%). Finally, Chrome was the leading desktop browser used for 55% of all sessions.

*Acquisition.* Acquisition refers to how users reach a website e.g., via a social media link, or directly inputting into a browser. Figure 5.10 illustrates the breakdown of acquisition figures and demonstrates that 67% of all sessions came direct to the website, most likely either by bookmarking the website, via an email link, or by the browser automatically saving the address. The other traffic sources were through social media (17%), organic search (9%), and linking from other websites (7%).

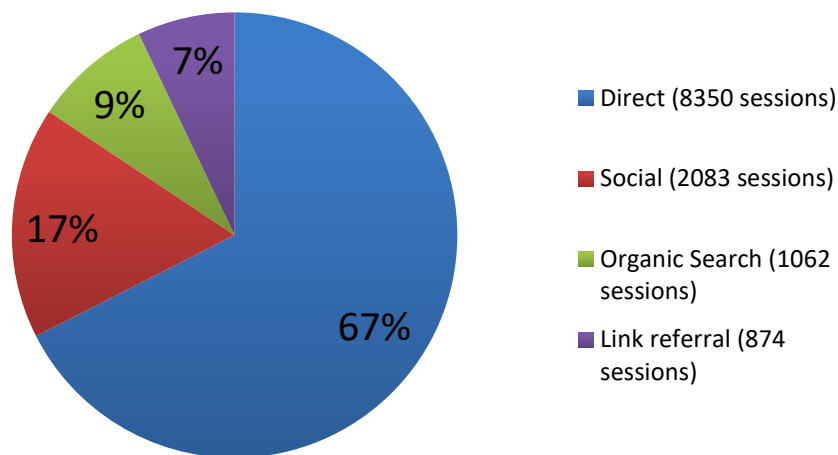


Figure 5.10. Acquisition characteristics categorised by traffic source.

The main social media platforms were Facebook, which resulted in 1,664 sessions, and Twitter, which resulted in 367 sessions. Meanwhile, the organic search traffic came almost exclusively through the Google search engine with 1,019 of the 1,062 sessions involving a search engine. Of the link referral traffic, 316 sessions resulted from links from [aspasp.org](http://aspasp.org) and 227 sessions from [learndash.com](http://learndash.com) (specifically from a blog article to promote the course written in October 2015).

*Geographical location of access.* Google Analytics data indicated that online course activity was geographically spread across 73 countries. A further 19 countries accessed the course website but did not engage with the course. Table 5.9 describes

the global spread of access during the course period for the top 20 countries containing users who visited course webpages.

Table 5.9

*Breakdown of geographic location of access (course sessions only – top 20 countries only)*

<b>Country</b>	<b>Sessions</b>	<b>% New Sessions</b>	<b>New Users</b>	<b>Bounce Rate</b>	<b>Pages / Session</b>	<b>Mean session duration (min:sec)</b>
Singapore	1,174	27%	320	14%	13.41	23:47
USA	598	28%	170	28%	9.33	15:21
Malaysia	577	21%	124	11%	10.26	20:01
Taiwan	500	26%	132	15%	14.40	22:39
Australia	439	23%	100	8%	13.70	20:57
UK	284	41%	115	17%	8.84	13:41
India	270	23%	61	11%	10.47	19:55
Greece	247	22%	54	11%	10.64	18:44
Brazil	158	32%	50	6%	10.27	18:20
Iran	141	29%	41	10%	13.98	23:18
Denmark	113	36%	41	5%	10.73	21:08
Mexico	113	7%	8	1%	5.23	7:54
New Zealand	98	11%	11	6%	9.54	19:28
Philippines	94	29%	27	35%	9.01	14:32
Finland	80	29%	23	11%	10.41	18:13
Germany	59	31%	18	10%	14.51	26:02
Canada	58	38%	22	22%	7.28	8:16
Hong Kong	58	29%	17	9%	7.47	15:50
Netherlands	51	27%	14	6%	9.00	19:21
Russia	48	44%	21	4%	9.58	20:58

The audience for the course was truly global with the greatest level of engagement coming from Singapore (the most represented country by some distance), USA, Malaysia, Taiwan, and Australia. Unlike the first iteration of the course, there was a greater mix of countries from outside the Asia-Pacific region remembering that the top five countries in the first iteration were Australia, Japan, Iran, Philippines, and Singapore.

**Reason for taking course and continuance intention.** Following on from web analytic data, Table 5.10 describes the intentional profile of the course participants. The reasons for enrolling were diverse, with the largest number of participants (39.4%) indicating that they enrolled on the course to learn about psychological techniques that could help in improving the performance of athletes with whom they work. In terms of continuance intentions, an overwhelming majority (82.6%) expressed that they intended to complete the course to earn a certificate.

Table 5.10

*Intention characteristics of course participants (N = 345)*

Variable	<i>n</i>	%
<b>Reason for enrolling</b>		
Free course	73	21.2
Passionate about sport	67	19.4
Improve personal performance	19	5.5
For coaching purposes	136	39.4
Interested in psychology	38	11.0
None of the above	12	3.5
<b>Intention</b>		
Browse course – no participation	4	1.2
Some participation – no certificate	26	7.5
Complete course to earn certificate	154	82.6
Undecided	7	8.7

**Associations between learner characteristics and course completion.** A series of crosstabs and chi-square analyses were conducted in order to establish associations between learner characteristics and course completion. The findings are detailed below.

**Sex.** No significant association was found between sex and completion (with Yates Continuity Correction),  $\chi^2(1, n = 345) = .627, p = .429$ .

**Age group.** No significant association was found between age group and completion,  $\chi^2(5, n = 345) = 7.105, p = .213$ .

**Education.** No significant association was found between level of education and completion,  $\chi^2(4, n = 345) = .761, p = .944$ .

**Reason for enrolling.** No significant association was found between reason for enrolling and completion,  $\chi^2(5, n = 345) = 10.709, p = .057$ . However, inspection of the crosstabs indicated that there might be some interaction between some of the reasons for enrolling in the course and subsequent progression. Viewing Table 5.11, it can be seen that there were more participants who completed the course who reported being passionate about sport or who were taking the course for coaching purposes than would be expected by chance. Conversely, a general interest in psychology was not associated with course completion, with fewer participants who reported a general interest in psychology completing the course than would be expected. However, none of these patterns were significant and therefore any interpretations should be treated with caution.

Table 5.11

*Reasons for enrolling x completion crosstabulation (N = 345)*

Reason for enrolling		Completed		
		Yes	No	Total
<b>Free course</b>	Count	35	38	73
	Expected Count	36.2	36.8	73
	% within Reason for Enrolling	47.9%	52.1%	100%
	% within Completed	20.5%	21.8%	21.2%
<b>Passionate about sport</b>	Count	37	30	67
	Expected Count	33.2	33.8	67
	% within Reason for Enrolling	55.2%	44.8%	100%
	% within Completed	21.6%	17.2%	19.4%
<b>Improve personal performance</b>	Count	8	11	19
	Expected Count	9.4	9.6	19
	% within Reason for Enrolling	42.1%	57.9%	100%
	% within Completed	4.7%	6.3%	5.5%
<b>For coaching purposes</b>	Count	75	61	136
	Expected Count	67.4	68.6	136
	% within Reason for Enrolling	55.1%	44.9%	100%
	% within Completed	43.9%	35.1%	39.4%
<b>Interested in psychology</b>	Count	14	24	38
	Expected Count	18.8	19.2	38
	% within Reason for Enrolling	36.8%	63.2%	100%
	% within Completed	8.2%	13.8%	11.0%
<b>None of the above</b>	Count	2	10	12
	Expected Count	5.9	6.1	12
	% within Reason for Enrolling	16.7%	83.3%	100%
	% within Completed	1.2%	5.7%	3.5%
<b>Total</b>	Count	171	174	345
	Expected Count	171	174.0	345
	% within Reason for Enrolling	49.6%	50.4%	100%
	% within Completed	100%	100%	100%

*Continuance intention.* On inspection of Table 5.12 below, it can be seen that there were more people who completed the course who reported an intention to earn a certificate than would be expected by chance. Conversely, being undecided was less associated with course completion, with fewer participants reporting being undecided on completing the course than would be expected.

Table 5.12

*Continuance intention x completion crosstabulation. (N = 345)*

<b>Continuance intention</b>		<b>Completed</b>		
		<b>Yes</b>	<b>No</b>	<b>Total</b>
<b>Browse – no participation</b>	Count	1	3	4
	Expected Count	2	2	4
	% within Continuance intention	25%	75%	100%
	% within Completed	0.6%	1.7%	1.2%
<b>Some participation</b>	Count	9	17	26
	Expected Count	12.9	13.1	26
	% within Continuance intention	34.6%	65.4%	100%
	% within Completed	5.3%	9.8%	7.5%
<b>Complete course to earn certificate</b>	Count	154	131	285
	Expected Count	141.3	143.7	285
	% within Continuance intention	54%	46%	100%
	% within Completed	90.1%	75.3%	82.6%
<b>Undecided</b>	Count	7	23	30
	Expected Count	14.9	15.1	30
	% within Continuance intention	23.3%	76.7%	100%
	% within Completed	4.1%	13.2%	8.7%
<b>Total</b>	Count	171	174	345
	Expected Count	171	174.0	345
	% within Continuance intention	49.6%	50.4%	100%
	% within Completed	100%	100%	100%



Counts for items that identified earning a certificate as not salient were combined to allow further examination of the associations between earning a certificate and course progression (Table 5.13). This was because there were low counts in some categories, specifically the *browse – no participation* item in which the observed value was below five. When such reasons were combined, an interest in completing the course and earning a certificate was positively associated with actual course completion, with significantly more participants identifying an interest in earning a certificate on completing the course than would be expected by chance. A significant association was therefore found between continuance intention and course completion,  $\chi^2(1, n = 345) = 13.10, p < .001$ , Cramer's  $V = .195$ .

Table 5.13

*Continuance intention x completion crosstabulation (N =345)*

<b>Certificate salient</b>	Count	154	131	285
	Expected Count	141.3	143.7	285
	% within Continuance intention	54%	46%	100%
	% within Completed	90.1%	75.3%	82.6%
<b>Certificate not salient</b>	Count	17	43	60
	Expected Count	29.7	30.3	60
	% within Continuance intention	28.3%	71.7%	100%
	% within Completed	9.9%	24.7%	17.4%
<b>Total</b>	Count	171	174	345
	Expected Count	171	174.0	345
	% within Continuance intention	49.6%	50.4%	100%
	% within Completed	100%	100%	100%

**Exploring causality orientations and course completion.** In total, 328 participants responded to the GCOS with no missing data. Data were imported into SPSS for further analysis. Data were screened for skewness and multivariate outliers, following recommendations by Tabachnik and Fidell, (2007). Specifically,

Mahalanobis distance testing at  $p < .001$  identified three outliers that were above the recommended critical value for the three variables assessed by the GCOS. It was deemed that these cases may unduly influence the results of the analysis and hence they were removed to create a new dataset with 325 cases ( $N = 325$ ). Cronbach's alpha coefficients were calculated for each sub-scale and demonstrated moderate to good internal consistency (autonomy orientation Cronbach's  $\alpha = 0.71$ ; control orientation Cronbach's  $\alpha = .69$ ; impersonal orientation Cronbach's  $\alpha = .79$ ).

Although all measures were taken as part of the full GCOS instrument, the impersonal scores were discarded from the final analysis, as the primary variables of interest were the control and autonomy orientations.

***Causality orientation as a predictor of course progression.*** It was hypothesised that autonomy-oriented learners would progress further into the course than control-oriented learners. A linear multiple regression analysis showed that neither autonomy nor control causality orientations predicted course progression. There was no significant relationship between reported scores for autonomy orientation and progression steps ( $r(323) = .038, p = .250$ ) and subsequently autonomy-orientation scores did not predict course progression ( $R^2 = .001, F(1, 323) = 0.46, p = .550$ ). Similarly, there was no significant relationship between scores for control orientation and course progression ( $r(323) = .092, p = .049$ ), and control orientation did not predict course progression ( $R^2 = .008, F(1, 323) = 2.77, p = .097$ ).

***Comparison between autonomy and control-orientations.*** To further examine any potential differences between orientations, scores for autonomy or control orientation were standardised in accordance with procedures recommended by Koestner et al. (1992), and Hagger and Chatzisarantis (2011). This allowed participants to be placed into autonomy-oriented ( $n = 155$ ) or control-oriented groups

( $n = 170$ ) as a measure of relative strength of motivational orientation. An independent samples t-test was conducted to compare course progression steps (as measured by number of modules completed) between the autonomy-oriented and control-oriented groups. The completion steps variable was found to be non-normally distributed in the sample, although following advice from Field (2013), the sample size was deemed large enough for an independent samples t-test to be applied to the data. This potential violation of test assumptions was moot as there was no significant difference in progression step scores between the autonomy-oriented group ( $M = 8.43$ ,  $SD = 3.56$ ), and control-oriented group, ( $M = 8.73$ ,  $SD = 3.55$ ),  $t(323) = 0.77$ ,  $p = .443$ .

**Basic psychological needs satisfaction over time.** Before investigating basic psychological needs satisfaction over time and any possible changes as learners progressed, the factor structure of the BPNOOES was assessed for acceptable model fit. This was considered necessary given that the BPNOOES was a derivative of the BPNES and therefore its psychometric properties were being applied in a new context. The factor structure of the first dataset collected at the early stages of the course was assessed as this presented the largest sample ( $N = 304$ ), with later measurements at T2 and T3 being smaller due to the natural attrition of the course. Data screening procedures showed no missing data, although three multivariate outliers were removed following assessment of Mahalanobis distance, subsequently giving a sample of size of  $N = 301$ .

An initial confirmatory factor analysis (CFA) on the BPNOOES sample when run through SPSS revealed some cross-loading between items within the autonomy and competence sub-scales. In circumstances where construct items overlap and thereby indicate problems in satisfying the independent cluster models (ICM)

restriction that forms the basis of CFA, Asparouhov and Muthén (2009) suggest exploratory structural equation modelling (ESEM) as a viable and elegant solution to allow further exploration of model fit. ESEM is appropriate at the initial stages of scale development because it allows the specification of factors, but does not constrain items to load onto a single factor (Day, Paquet, Scott, & Hambley, 2012), as with CFA. Also, ESEM is relevant to the understanding of the BPNOOES because although the three-factor structure is hypothesised to translate to a new context (based upon the original BPNES), it is effectively a new scale. ESEM is therefore a useful tool, which as Marsh, Morin, Parker, and Kaur (2013) observe, provides an “integrative framework” (p. 86) that brings together the best aspects of confirmatory factor analysis and structural equation modelling with more traditional exploratory factor analysis (EFA).

The proposed psychometric structure of the BPNOOES is presented in Figure 5.11 and describes the hypothesised first-order model with the three basic psychological need factors as latent variables (competence, autonomy, and relatedness) and their corresponding observed measures (items from the BPNOOES). First, competence was measured in terms of perceived progress, success, performance, and challenge. Second, autonomy was measured in relation to perceived self-endorsement, volition, self-congruence, and being choiceful. Finally, relatedness was measured in terms of perceptions of friendliness, communication, and closeness to others.

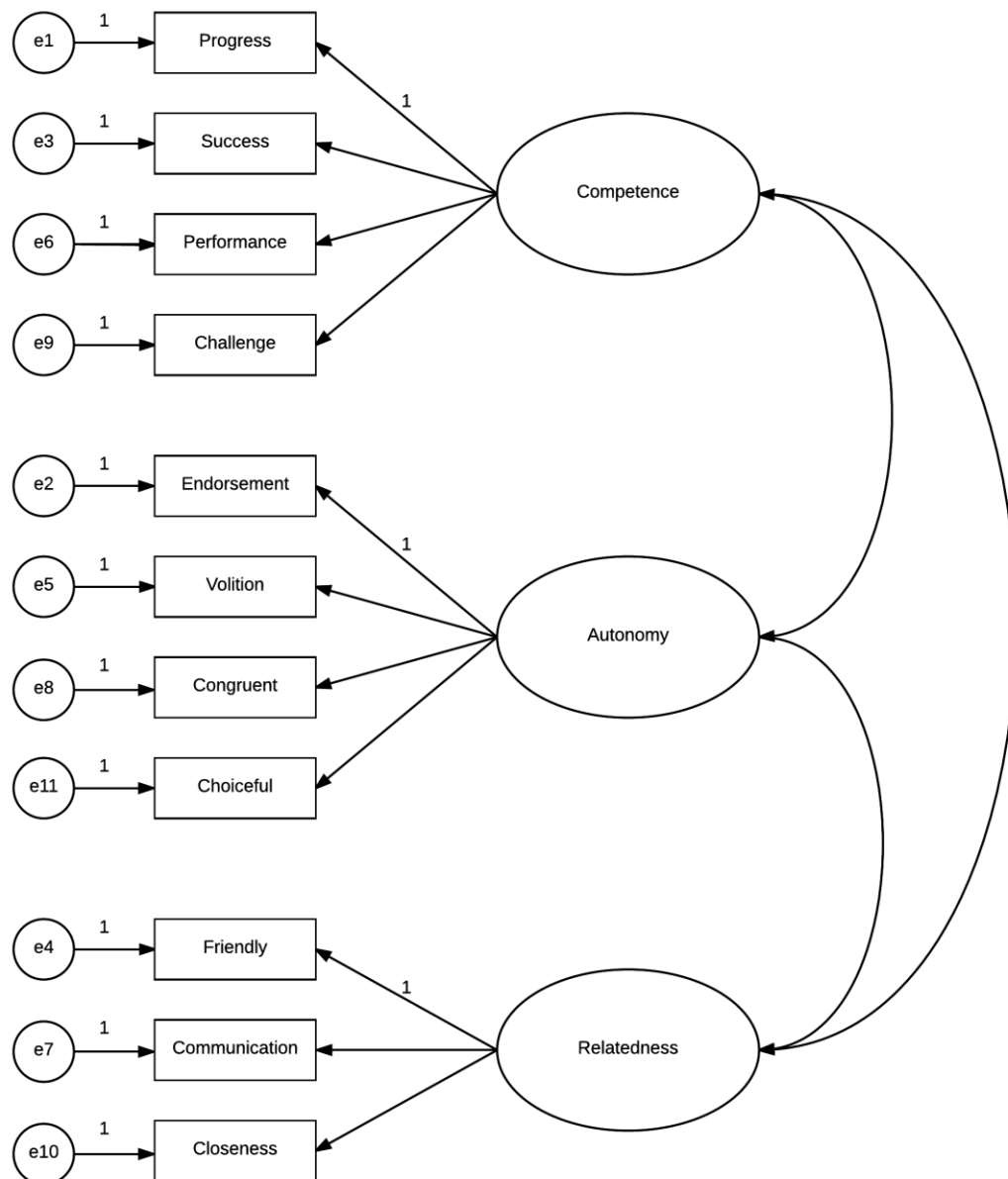


Figure 5.11. Hypothesised hierarchical model for the BPNOOES.

Following preliminary data screening, ESEM procedures in the Mplus statistical package (Muthén & Muthén, 2015) were used to test the expected three-factor measurement model for the BPNOOES. The measurement model was estimated using robust diagonal weight least squares with a mean-and-variance adjusted test statistic, operationalised as the WLSMV estimator in Mplus 7.31. The ESEM analyses were conducted using target rotation (Browne, 2001; Myers, Jin, Ahn, Celimli, & Zopluoglu, 2015). For model fit assessment, three approximate fit

indices (standard to ESEM) were considered: RMSEA, < .050 and .080 for close and reasonable fit; Comparative fit index (CFI); and Tucker-Lewis Index (TLI), > .900 and .950 for acceptable and excellent fit, respectively (Marsh, Hau, & Wen, 2004). A confidence interval of 90% was used for the RMSEA value. The three-factor ESEM model provided a good fit to the data,  $\chi^2(25) = 48.38, p = .003, CFI = .99, TLI = .99, RMSEA = .06 (.03, .09)$ . The standardised path coefficients are shown in Table 5.14.

Table 5.14

*Standardised path coefficients for three-factor model of the BPNOOES.*

Variable	Competence	Autonomy	Relatedness
Progress	0.20	<b>0.41</b>	0.14
Success	<b>0.80</b>	0.08	0.04
Performance	<b>0.59</b>	0.21	0.11
Challenge	<b>0.79</b>	-0.01	0.07
Endorsement	<b>0.39</b>	<b>0.52</b>	-0.17
Volition	-0.01	<b>0.93</b>	-0.02
Congruent	-0.04	<b>0.65</b>	0.24
Choiceful	0.20	<b>0.59</b>	0.01
Friendly	0.00	0.09	<b>0.77</b>
Communication	0.23	-0.18	<b>0.97</b>
Closeness	-0.11	0.11	<b>0.82</b>

*Note:* All factor loadings are significant ( $p < .001$ ).

Factor correlations between the latent variables were as follows: Competence with autonomy = .83; competence with relatedness = .42; autonomy with relatedness = .51. The model presented provides an acceptable fit to justify forming a scale, with three caveats. First, autonomy and competence are more highly correlated than expected in this particular dataset. Although other researchers have found autonomy and competence to be highly correlated in different contexts (e.g., Van den Broeck,

Vansteenkiste, De Witte, Soenens, & Lens, 2010), this phenomenon warrants further investigation. To speculate, the high correlation may be a product of the unique online environment coupled with the already highly educated cohort of learners participating in the course. Second, perceived progress loads more strongly on to autonomy than competence. One possible explanation for this is that the progress item (i.e., *“I feel I have made a lot of progress in relation to the goal I want to achieve”*) was considered in the early stages of the course, which may have caused some confusion in interpretation of the item by some participants. Finally, there is a degree of cross-loading of the endorsement item on to autonomy and competence, although the item loads more strongly on to autonomy as expected. With knowledge of these limitations but accepting the model, levels of basic psychological needs satisfaction were examined over time for those who reached the end of the course and completed all three BPNOES instruments as they progressed. Through this natural attrition the number of participants who completed all three questionnaires was 206 participants ( $N = 206$ ). It was hypothesised that levels of autonomy, competence, and relatedness would significantly increase as learners progressed through the course.

Data were once again checked for any multivariate outliers and using Mahalanobis distance at  $p < .001$  a total of six outliers were identified, where following individual review, all were deemed plausible and remained in the dataset. Cronbach's alpha coefficients were calculated for each sub-scale and demonstrated good to excellent internal consistency across T1, T2, and T3 (autonomy  $\alpha = .73-.84$ ; competence  $\alpha = .77-.83$ ; relatedness  $\alpha = .87-.93$ ). A visual inspection was made to check for skewness and kurtosis of the sample. Autonomy and competence across T1, T2, and T3 were considered to be positively skewed, indicating that participants tended to report relatively high levels of autonomy and competence at all three

timepoints. Meanwhile, relatedness was considered to approximate normal distribution across the three temporal points. Given the sample size of greater than 200, and following recommendations from Tabachnik and Fidell, (2007), it was concluded that the non-normal distribution of autonomy and competence scores did not pose a threat to the analysis. Consequently, a series of repeated measure ANOVAs were conducted to assess for significant changes in measured autonomy, competence, and relatedness over time.

Descriptive statistics and ANOVA findings for measured autonomy, competence, and relatedness are presented in Tables 5.15-5.17.

Table 5.15

*Descriptive statistics for measured autonomy for T1, T2, and T3 (N = 206).*

<b>Time period</b>	<b><i>M</i></b>	<b><i>SD</i></b>
T1	16.84	2.41
T2	16.84	2.61
T3	16.97	2.64

Mauchly's test of sphericity indicated that the assumption of sphericity was violated ( $\chi^2 (2) = 11.95, p < .01$ ), therefore degrees of freedom were adjusted in accordance to a Greenhouse-Geisser estimate of sphericity ( $\epsilon = .95$ ). No significant differences were found in measured autonomy across the duration of the course ( $F(1.89, 387.92) = 0.76, p = .46, \eta_p^2 = .004$ ).



Table 5.16

*Descriptive statistics for measured competence for T1, T2, and T3 (N = 206).*

<b>Time period</b>	<b><i>M</i></b>	<b><i>SD</i></b>
T1	16.38	2.49
T2	16.48	2.45
T3	16.90	2.33

Mauchly's test of sphericity indicated that the assumption of sphericity was violated ( $\chi^2(2) = 8.06, p < .05$ ), therefore degrees of freedom were adjusted in accordance to a Greenhouse-Geisser estimate of sphericity ( $\epsilon = .96$ ). A significant difference was found in measured competence across the duration of the course ( $F(1.93, 394.72) = 8.44, p < .001, \eta_p^2 = .04$ ). The effect size can be considered to be small to moderate using guidelines proposed by Cohen (1988). Pairwise comparisons with a Bonferroni adjusted alpha level of .02 per test (i.e.,  $0.05/3$ ), indicated significant differences between measured competence at T1 ( $M = 16.38, SD = 2.49$ ) and T3 ( $M = 16.90, SD = 2.33$ ),  $p = .001$ , and between T2 ( $M = 16.48, SD = 2.45$ ) and T3 ( $M = 16.90, SD = 2.33$ ),  $p = .002$ . No significant difference between T1 and T2 was found.

Table 5.17

*Descriptive statistics for measured relatedness for T1, T2, and T3 (N = 206)*

<b>Time period</b>	<b><i>M</i></b>	<b><i>SD</i></b>
T1	9.73	3.16
T2	9.58	3.33
T3	9.74	3.36

Mauchly's test of sphericity indicated that the assumption of sphericity was violated ( $\chi^2(2) = 31.36, p < .001$ ), therefore degrees of freedom were adjusted in accordance to a Greenhouse-Geisser estimate of sphericity ( $\epsilon = .88$ ). No significant differences were found in measured relatedness across the duration of the course ( $F(1.75, 358.87) = 0.82, p = .43, \eta_p^2 = .004$ ).

### **Post-course Survey**

**Procedure.** In the days following the official completion of the course, two surveys were sent out to participants who had been identified as either (a) engaging with the course or (b) not engaging with the course. Engagers were defined as those who had at least completed the introduction (and therefore the first learning module), whereas non-engagers were defined as those who had either registered or enrolled, but offered no further interaction with the course, or had not progressed past the welcome content.

Two surveys were created and administrated using Qualtrics, with each survey targeted towards separate cohorts of course registrants. The first survey contained items from the IMI plus an open-ended response item requesting personal feedback on the course, specifically *Please tell us your thoughts about Elite Sport Performance: Psychological Perspectives in the box below. Your feedback will be useful in helping us develop the course further into the future.* The second survey was sent out via an automated email from Qualtrics to those who did not engage with the course. The questionnaire contained one item with six possible responses that probed reasons for not participating in the course and an open-ended question offering an opportunity for further elaboration if the respondent wished to do so. Emails were sent out to both participant cohorts, with automated follow up reminders sent 1 week and 2 weeks after the survey launched, with the survey closing after 3 weeks.

Participants who had already completed the survey did not receive a follow up reminder. The University of Southern Queensland Human Research Ethics Committee approved this additional research via an amendment to the original application (Approval No. H15REA007; see Appendix M).

Responses to both surveys were downloaded from Qualtrics for further examination and analysis. The open-ended questions were analysed using a methodology informed by Krippendorff's (2013) content analysis approach, which allowed responses to be independently coded and categorised to shed further light on the data collected. Data were coded using NVivo 11 (QSR International NVivo, 2015), which allowed specific responses to be selected and encoded according to inductively identified categories. Example categories identified for further reliability coding included *absence of pressure, interest and enjoyment*, and *not useful* in the engagement survey. Meanwhile, example categories identified for further analysis included *work commitments, language issues*, and *forgot or not salient* in the non-engagement survey.

The author and a second coder coded the responses separately and independently. This approach is seen as good practice in content analysis because it is purported to increase the reliability of the data (Lombard, Snyder-Duch, & Braken, 2002). Inter-coder reliability measures were calculated as percentage agreement between the coders; that is, the proportion of the sum of agreed items between coders to the sum of the total number of items identified by each coder. For example, if coder A found 21 items in a category and coder B found 20 and they agreed on 14 items, the inter-coding reliability would be 28 divided by 41 and multiplied by 100 or 68%. The reliability calculation is summarised by the equation:

$$\textit{Reliability} = \frac{\text{Coder A agreed items} + \text{Coder B agreed items}}{\Sigma \text{items coded}} \times 100$$

To further illustrate the open-ended responses and to act as a crosscheck against the content analysis, all open-ended content was text analysed using the open-source software Voyant Tools (Sinclair & Rockwell, 2016). A *Cirrus* word cloud was then created to describe the most frequent terms provided by participants.

**Results.** The engagement survey received 143 responses, representing a response rate of 36% based on the number of surveys sent out to the cohort who engaged with the course. In addition, there were 76 responses to the open-ended question. The non-participation survey received 187 responses, representing a response rate of 31% based on the number of surveys sent out to the cohort who did not engage with the course. In total 88 responses were received to the open-ended question.

**Engagement survey.** Table 5.18 provides an overview of the survey from 143 responses. Scores were self-reported on a 1-7 scale where lower end scores (i.e., 1-3) represent *not at all true*, scores around the median (i.e., 3-5) represent *somewhat true*, and higher end scores (i.e., 5-7) represent *very true*. In general terms the scores were encouraging, with for example a mean score of 6.03 ( $SD = 1.03$ ) for enjoyment of the course, and 6.26 for interest in the course ( $SD = 0.85$ ). Scores were also proportionally high for items related to competence, effort and importance, perceived choice, and value and usefulness. Meanwhile, participants felt relaxed when participating in the course ( $M = 6.10$ ,  $SD = 1.03$ ) and considered that they were under low pressure ( $M = 2.41$ ,  $SD = 1.62$ ). Finally, scores pertaining to relatedness were proportionally lower with a mean score of 3.13 for feelings of closeness to other learners ( $SD = 1.73$ ), but also perceived salience of relatedness seemingly lower with

only a mean score of 4.78 for wishing to interact with others more often ( $SD = 1.73$ ). The overall picture therefore for this survey suggests that participants felt intrinsically motivated and that many of the conditions that support intrinsic motivation were in place, such as an absence of pressure and perceived choice. The data provides further evidence of high quality motivation and a needs-supportive environment. Furthermore, learners felt competent, found the course useful and personally important, and were willing to put in effort. Finally the proximal role of relatedness was proportionally lower, but perhaps was less important to overall engagement in this particular context.

***Open-ended responses.*** In total 346 items were coded from 76 open-ended responses of which 233 were agreed by both coders giving a mean inter-coder reliability of 67%. As a general rule of thumb, Neuendorf (2002) proposes that reliability scores over 80% are acceptable and 70% to 80% agreement appropriate in exploratory studies. Items over 65% have been included for illustrative purposes, but should be considered with caution and in conjunction with related IMI scores where appropriate. Only themes that contained 10 items or more with inter-coder reliability above 65% are reported in these results. Key themes agreed by both coders included *constructive feedback and suggestions for improvements* (57 items, 73% reliability), *would recommend to others* (11 items, 72% reliability), *gratitude and praise for the course* (91 items, 72% reliability), *participant interest and enjoyment* (62 items, 67% reliability), and *found the course useful or beneficial* (58 items, 69% reliability). Some example responses are described in Table 5.19 and presented verbatim with corresponding unique learner IDs and location data from LearnDash included.

Table 5.18

*Mean scores for items from the Intrinsic Motivation Inventory based on a 1-7 scale (N = 143, see Appendix L)*

<b>Constructs</b>	<b>Item</b>	<b>M</b>	<b>SD</b>
<b>Interest and enjoyment</b>	<i>I enjoyed doing this open online course very much.</i>	6.03	1.03
	<i>I would describe this open online course as very interesting.</i>	6.26	0.85
<b>Perceived competence</b>	<i>I am satisfied with my performance in this open online course.</i>	5.23	1.39
	<i>After working on this open online course for a while, I felt pretty competent.</i>	5.59	1.21
<b>Effort and importance</b>	<i>I put a lot of effort into this open online course.</i>	5.08	1.51
	<i>It was important to me to do well in this open online course.</i>	5.27	1.52
<b>Pressure and tension</b>	<i>I was very relaxed in doing this open online course.</i>	6.10	1.03
	<i>I felt pressured while doing this open online course.</i>	2.41	1.62
<b>Perceived choice</b>	<i>I believe I had some choice about doing this open online course.</i>	5.99	1.13
	<i>I did this open online course because I wanted to.</i>	6.34	0.98
<b>Value and usefulness</b>	<i>I believe this open online course could be of some value to me.</i>	6.16	0.94
	<i>I believe doing this open online course could be beneficial to me.</i>	6.20	0.92
<b>Relatedness</b>	<i>I'd like a chance to interact with people more often in this open online course.</i>	4.78	1.50
	<i>I feel close to other people in this open online course.</i>	3.13	1.73

Table 5.19

*Example responses to open-ended question in engagement survey (n = 76)*

<b>Category</b>	<b>Example response</b>
<b>Constructive feedback</b>	<b>Example 1.</b> <i>I hope there will be more advanced levels in the future.</i> (Learner 106, Philippines).
	<b>Example 2.</b> <i>Missing a chapter on modern technology in sport psy.</i> (Learner 75, Hungary).
<b>Recommend to others</b>	<b>Example 1.</b> <i>Aside from myself, I was also able to introduce this course to my sporting fraternity who were interested in doing Sport Psychology.</i> (Learner 83, Singapore)
	<b>Example 2.</b> <i>I would advise anyone to take it, even if they think they know it all.</i> (Learner 995, Malaysia).
<b>Gratitude and praise</b>	<b>Example 1.</b> <i>I think it's a wonderful course, the material is also really apt, I loved the interactive approach of sharing your points of view on the discussion forum.</i> (Learner 962, Greece).
	<b>Example 2.</b> <i>Dear Peter and Neil, my impressions about the course are very positive. You developed and unselfishly shared very innovative and interactive course among sport and exercise psychology community. I was very much pleased and thankful for being part of it.</i> (Learner 248, Serbia).

Table 5.19 (continued)

Category	Example response
<b>Interest and enjoyment</b>	<p><b>Example 1.</b> <i>I found the references to real life example, video clips, etc. most interesting. (Learner 351, New Zealand).</i></p> <p><b>Example 2.</b> <i>I really enjoyed the content as it was so practical and easy to read. (Learner 455, South Africa).</i></p>
<b>Useful and beneficial</b>	<p><b>Example 1.</b> <i>I am a psychologist working in general practice and often see people who are struggling to reach their performance goals in sport or in work or in other areas of life. This course really brought together the theoretical and practical aspects of psychology in a way that helped me to formulate a cohesive approach to helping these people. (Learner 1010, Australia).</i></p> <p><b>Example 2.</b> <i>Personally, I found this course to be very beneficial to me and has served as an 'anchor' to all my previous education and courses which I have completed in my 15 years of working with athletes from the various sporting discipline as a Sports Mental Skills Coach. (Learner 83, Singapore).</i></p>



The Cirrus text cloud generated through Voyant tools concurs with the themes that emerged from the content analysis and can be seen in Figure 5.12. It illustrates that a number of words related to engagement and also positive sentiment are relatively frequent in responses including *interesting*, *enjoyed*, *like*, *thank*, *beneficial*, and *helpful*.

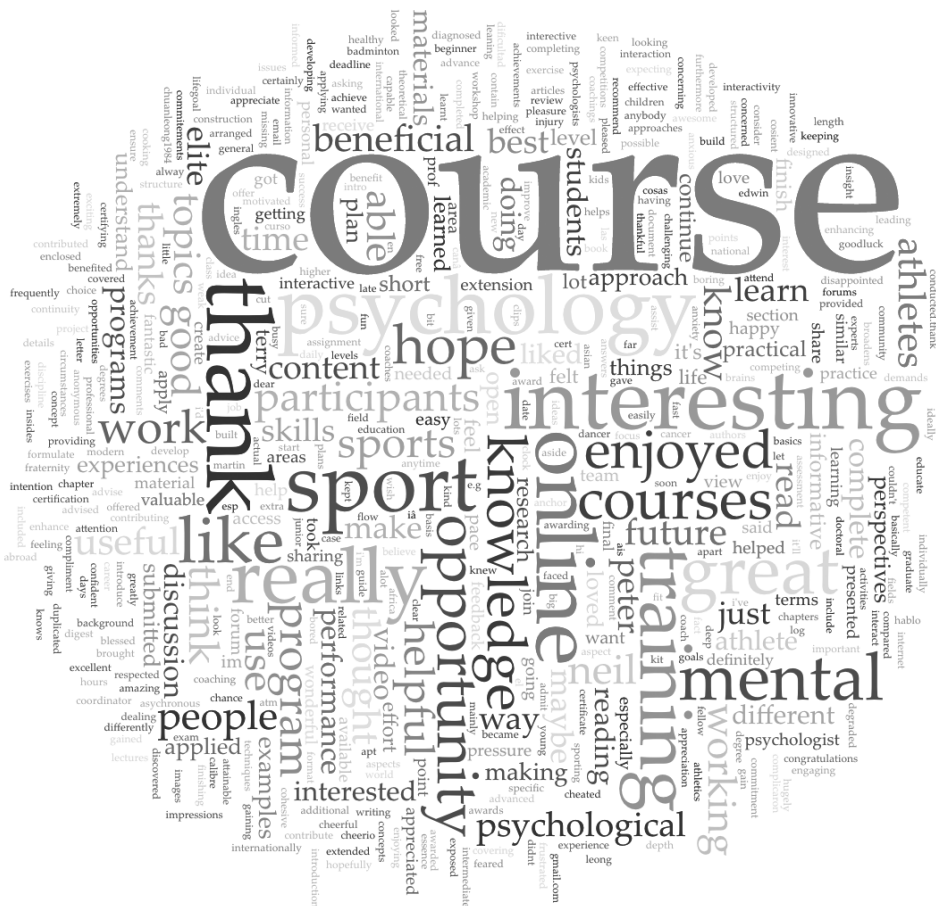


Figure 5.12. Cirrus text cloud from Voyant Tools showing relative frequency of words used in open-ended responses from course engagers ( $n = 76$ ).

**Non-engagement survey.** Table 5.20 provides an overview of the non-engagement survey from 187 responses. The table illustrates that a significant proportion of respondents intended to participate in the course but other matters in their life prevented them from participating. Interestingly, nearly a quarter of all respondents simply forgot about the course, perhaps registering with the intention of

coming back later, but never doing so. Significantly, no respondents stated that the course was uninteresting to them and given that this data included participants who had at least engaged with the welcome content as well as received supporting information about the course, this figure is encouraging.

Table 5.20

*Responses to non-engagement survey (N = 187)*

<b>Reason for non-participation in course</b>	<i>n</i>	<i>%</i>
<i>I registered for the course but then forgot about it.</i>	42	22%
<i>The course content did not interest me.</i>	0	0%
<i>The course wasn't what I expected.</i>	3	2%
<i>The course looked too challenging for me.</i>	4	2%
<i>I wanted to participate further, but other priorities got in the way.</i>	120	64%
<i>None of the above reasons explain my lack of participation.</i>	18	10%

***Open-ended responses.*** In sum 237 items were coded from 88 open-ended responses of which 186 were agreed by both coders giving an inter-coder reliability of 78%, which was an acceptable level of reliability. Once again, only themes that contained 10 items or more and with inter-coder reliability above 65% are reported in these results. Additionally 12 items were coded as other, but do not have a common theme. Key themes relating to non-participation in the course agreed by both coders included: *education commitments* (38 items, 88% reliability), *work commitments* (34 items, 81% reliability), *technical issues* (12 items, 81% reliability), *forgot about the course/not salient* (18 items, 72%), and *time commitments – general* (33 items, 66%). Example responses are presented in Table 5.21 and are presented verbatim.

Table 5.21

*Example responses to open-ended question in non-engagement survey (n = 88)*

<b>Category</b>	<b>Example response</b>
<b>Education commitments</b>	<p><b>Example 1.</b> <i>My master thesis got in the way – I would love to participate in another course if possible. (Learner 126, Denmark).</i></p> <p><b>Example 2.</b> <i>I am in grad school and thought this would be a great opportunity. Unfortunately, I became too busy with my own research, TA and RA duties. (Learner 336, Canada).</i></p>
<b>Work commitments</b>	<p><b>Example 1.</b> <i>I have extensive commitments in organisation of shooting tours (long range target rifle) with responsibility for the Scottish Commonwealth Games squad as well as running the GB team in 2016. For the latter I have had to set up all the training before the tour to USA/Canada as well as sort out all the logistics and fundraising. (Learner 196, United Kingdom).</i></p> <p><b>Example 2.</b> <i>There were some issues going on at the football club I work at, which required me to do a lot of extra work during that time... not allowing me to have the time to complete the course. If the course would be offered again, I would definitely complete it! (Learner 758, Sweden).</i></p>

Table 5.21 (continued)

Category	Example response
<b>Technical issues</b>	<p><b>Example 1.</b> <i>I signed up but received no email and then could not find the course information. I would really like to take the course.</i> (Learner 1033, United Kingdom).</p> <p><b>Example 2.</b> <i>Poor internet connection in Europe where I am working currently.</i> (Learner 563, France).</p>
<b>Forgot/not salient</b>	<p><b>Example 1.</b> <i>To be honest completely forgot about the class.</i> (Learner 258, United States).</p> <p><b>Example 2.</b> <i>So I registered for the course but then forgot about it.</i> (Learner 1037, New Zealand).</p>
<b>Time commitments - general</b>	<p><b>Example 1.</b> <i>Sorry I had too many things on.</i> (Learner 689, United Kingdom).</p> <p><b>Example 2.</b> <i>Didn't get the time to commit to it.</i> (Learner 286, New Zealand).</p>

The open-ended responses provided further context on the reasons for not taking part, particularly that other priorities at the time were more salient than the course, including work or education commitments. Of some concern were the few respondents who indicated that they had not received an email on registration, but would have liked to participate. Given that most learners did get an email and the registration process was tested in the design phase, the most likely reason for this was that the email went into a user's spam box and so was not seen, something that warrants further investigation.

Once again the Cirrus text cloud generated through Voyant tools concurred with the content analysis data from the open-ended question and can be viewed in Figure 5.13. It illustrates words related to other life pursuits including *time*, *commitments*, *busy*, *work*, *thesis*, and *study*, as well as *forgot*.



Figure 5.13. Cirrus text cloud from Voyant Tools showing relative frequency of words used in open-ended responses from course non-engagers ( $n = 88$ ).

## Discussion

The aim of the present study was to examine engagement characteristics of the second iteration of *Elite Sport Performance: Psychological Perspectives*. The study utilised web analytic data to map online activity and engagement throughout the life of the course. It also considered the demographic characteristics of the learners who enrolled on the course, their reasons for registering, and their continuance intentions. Causality orientations i.e., individual differences in motivational orientation, were investigated to see if they had any association with course progression (remembering the autonomous and self-directed nature of the course). Also, any possible changes in basic psychological needs satisfaction over time for those who reached the end of the course were interrogated. Finally, further evidence was gathered to examine the extent

to which learners felt intrinsically motivated or believed that the course was beneficial to them having engaged with the course. Meanwhile, to complete the narrative of the present study, reasons for not engaging in the course were also investigated. The remainder of this chapter will now consider the results in light of the research questions formulated earlier. Where hypotheses have been proposed, they will be examined to see if they were supported or not.

**Research Question 1: What patterns of activity and engagement were present in the course and how do such patterns compare to the first iteration?** In

general terms, the Google Analytics data recorded for *Elite Sport Performance: Psychological Perspectives* builds a picture of an open online course that had sustained activity and strong engagement throughout. When compared to the first iteration of the course from late 2013, activity and engagement was surpassed by degrees of magnitude in terms of pageviews, session times, number of forum posts, and other measures of engagement. For example, the total number of sessions measured for the first iteration of the course was already surpassed by the fifth day of the presentation of the second course. Also as direct comparison, the first iteration of the course averaged 9 sessions per day and 59 pageviews per day, meanwhile the second iteration of the course averaged 85 sessions per day and 584 pageviews per day, an increase in activity by almost a factor of ten.

The second iteration of the course also surpassed benchmark figures for other educational websites and MOOCs in terms of engagement measures. However, the so-called *funnel of participation* (Clow, 2013) was still present in this open online course as with others. Over 1,000 participants registered for the course (many of whom during a surge of enrolments following the course marketing period), but around 270 progressed to the last module of the course and 200 submitted a mental

training program. Nevertheless, this course had double the average completion rate for MOOCs (see for example Jordan 2015; Reich 2014). The creation and submission of a mental training program for example, represented a real commitment for the learners remembering that they received no formal qualification at the end.

Progression data evidenced that once a learner committed to the course, they were more likely to continue to the end. The shape of progression approximated to a non-symmetric parabolic curve with a high volume of participants not engaging or making very little progress, very few dropping out in the middle of the course, and a large number progressing right through to the end. This contrasts with the first iteration of the course, where overall activity was not sustained and progression fell away relatively quickly. The maintenance of online activity over the lifespan of the course can be attributed in part to a change in design in which learners could join the course at any time and work through the course at their own pace (as opposed to having to complete certain tasks at specific points in time).

Finally, web analytics revealed that the learners came from all over the world with many more countries involved than the first iteration. The main focus of activity remained in Asia perhaps in part due to ASPASP sponsorship and associated communication networks to promote the course. Of concern was the fact that Africa was dramatically under represented (see Table 5.22), which most likely is a product of access to the Internet from the world's poorest continent, who nevertheless would have much to benefit from free open online courses. Those who did access the course did so through a range of devices and there was a measurable increase in the ratio of mobile and tablet accesses to traditional desktop. The most likely explanation for this was that more learners are comfortable with accessing learning content through their mobile device coupled with the fact that the course platform had been optimised for



universal access between desktop, mobile, and tablet devices. To speculate further, the increase in mobile activity may also reflect improvements in smartphone technology (e.g., faster processors and larger screens), and the possibility that many learners may only possess a smartphone as their access device.

Table 5.22

*Summary of accesses by continent*

<b>Continent</b>	<i>Sessions</i>	<i>%</i>
Asia	2,974	52.35%
Europe	1,103	19.42%
Americas	985	17.34%
Oceania	537	9.45%
Africa	67	1.18%
Unknown (not detected)	15	0.26%
<b>Total</b>	<b>5,681</b>	<b>100.00%</b>

**Research Question 2: What were the demographic and intentional characteristics of the learners and did these characteristics have any associations with engagement?** A relatively young and well-educated cohort of learners represented a prominent profile in this open online course. Furthermore, many tended to work with athletes and it would seem were using the course for professional development or to supplement coaching knowledge. Indeed, there was further qualitative evidence of this when perusing the forums and also the final engagement survey. In the design phase of the course, a coaching persona was created which to some extent matched this profile and perhaps is testament to the usefulness of generating personas to develop an internal frame of reference of potential users. The course was marketed to potential participants as sharing expert knowledge in psychological skills training and therefore it is perhaps unsurprising that the cohort

described above was most represented. Moreover, it was this group who were most likely to complete the course, perhaps because the content was salient to their interests and requirements. In other words, the course with its authentic and real world content, was designed with this group in mind and perhaps unsurprisingly this group was subsequently the most engaged.

Continuance intention was biased towards the certificate of completion. In this particular course the bias was stronger than in the Reich (2014) study from which the survey items were drawn. Table 5.23 shows this comparison remembering that Reich's study examined a number of MOOCs and therefore had a huge dataset ( $N = 79,525$ ) in terms of item response numbers.

Table 5.23

*Benchmarking continuance intention against Reich (2014) MOOC study (nine courses)*

<b>Reasons for taking course</b>	This course (%)	Reich study (%)
Browse course – no participation	1%	3%
Some participation – no certificate	8%	25%
Complete course to earn certificate	82%	58%
Undecided	9%	14%

Examination of a subset of Reich's data shows a stronger match to the responses found in the present study and therefore the figures for this course are not necessarily atypical. Table 5.24 compares the responses in the present study to a course about Clinical Trials ( $n = 8,992$ ).

Table 5.24

*Benchmarking continuance intention against Reich (2014) MOOC study (Clinical Trial course)*

<b>Reasons for taking course</b>	This course (%)	Reich study – Clinical Trials course (%)
Browse course – no participation	1%	2%
Some participation – no certificate	8%	10%
Complete course to earn certificate	82%	78%
Undecided	9%	9%

*Note:* Reich's figures add up to 99%, presumably due to rounding.

Given that Reich's assessed courses included a range of subject matters including U.S. Health Policy, Science and Cooking, Ancient Greek Heroes, etc., it is possible that courses that are more professionally focussed are likely to have greater intentional bias towards a certificate of completion.

The Reich study also offered evidence to suggest that those who intended to gain a certificate of completion were more likely to complete than those who only intended to browse. In the Reich study 22% of those who intended to gain a certificate completed the course, whereas only 6% of browsers completed. Similarly, the Clinical Trials Course reported 25% of those who intended to gain a certificate completed the course and 9% of browsers completed. Within the limitations of the different sizes of dataset, these findings are supported in the present study, albeit with different percentage scores. More specifically, 25% of browsers completed the course the course and 54% those wanting a certificate also progressed to the end.

The continuance intention data collected from *Elite Sport Performance: Psychological Perspectives* offers evidence to suggest that the certificate of completion was a salient feature for many. This is perhaps surprising given that the

certificate of completion was not an accredited recognised qualification, yet for many may be assumed to represent some form of achievement. To speculate from the perspective of organismic integration theory (OIT; Deci & Ryan, 1985b), a sub-theory of self-determination theory, the certificate of completion was for many a representation of learning that was inherently valued. This is possibly because the certificate acted as a representation of a personally integrated value of effort and achievement, rather than simply just being an unaccredited qualification. To put it another way, in general the certificate of completion *in itself* had no functional significance (Ryan & Deci, 2017, p. 75) that outwardly shifted the personal causality of the learners and thereby changed their relative autonomy. The learners engaged deeply with the course as evidenced by the web analytic data (e.g., engagement times) rather than simply focussing on receiving a certificate.

Evidence has been presented in the chapter to show deep engagement with *Elite Sport Performance: Psychological Perspectives* for those who chose to persist with the course. However, it would be overly optimistic to suggest that all learners who submitted a valid mental training program and received a certificate of completion did so for intrinsic (or autonomous) reasons alone. Indeed, as noted earlier, the minimum number of days to complete the course was one day, which was too short given the intended length of the course. In those examples it is very possible that obtaining certificate of completion was the main motivation of the learner. Concomitantly, self-determination theory would also predict that on average the quality of engagement would be lower.

A final point of consideration is that there may have also been a cultural dimension to explain the findings, with many learners coming from Asia in which earning a certificate tends to be highly valued and perhaps could be offered as

evidence of professional development. In this context, the certificate potentially took on a different salience than was intended in the design, which was to act as a simple recognition of success.

**Research Question 3: Does motivational orientation (general causality orientation) predict course progression in the context of this open online course?**

It was hypothesised that autonomy-oriented learners would progress further into the course than control-oriented learners. The inference behind this hypothesis was that because the course was designed to be autonomy-supportive and with limitations on external controls or contingencies, autonomy-oriented learners would progress further in the course. The findings do not support this hypothesis; causality orientation did not predict course progression and there were no significant differences in progression between autonomy-oriented and control-oriented learners.

A number of possible explanations may account for these findings. First, being control-oriented does not mean one cannot experience autonomy. On the contrary, given that self-determination theory postulates autonomy as a universal basic psychological need necessary for healthy and high quality functioning, all humans should respond positively to autonomy support if they perceive the environment to be autonomy-supportive. However, control-oriented individuals are theorised to less accurately internally process autonomy support and be more responsive to contingencies (Vansteenkiste et al., 2010). Perhaps, in this open online course those who were more control-oriented in general accurately understood the autonomy-supportive context. This may have been because it involved voluntary enrolment and the information provided was consistently autonomy-supportive.

Second, there was an absence of salient controlling contingencies that control-oriented individuals may have been more susceptible to had they been in place. A

clear example built into the design was that the course did not have explicit pass or fail states. Those who persisted with the course were given the opportunity to work through learning content, build their knowledge of psychological skills training, and submit a mental training program if they wished. If a pass or fail state is considered to be a contingency, then control-oriented individuals are more likely to persist with the course following a failure, which as reported by Koestner and Zuckerman (1994) is because the control-oriented individual needs to restore self-worth. Given that this condition was not in place in course activities e.g., there was no formative assessment during the course, then it may be cautiously concluded that control-oriented individuals had no reason to persist any more than autonomy-oriented individuals.

Third, the GCOS relies on self-report of 36 items arranged into 12 vignettes with each vignette corresponding to general life scenarios. It is possible that this scale, which was deployed online and did not explicitly examine the open educational domain, was unable to accurately measure causality orientations for this specific context to predict behaviour. Theoretically, these orientations are relatively stable over time, but may manifest in different amounts in different contexts. Spence and Deci (2016) describe causality orientations as an aggregate of life experience across many domains and a specific surface trait of personality. To put it another way, in one life domain one can be autonomy-oriented e.g., in education, but in another appear to be more control-oriented e.g., playing sport. However, when taken together in light of personality and life experiences, an individual will fall into a specific orientation category from which general predictions can be made. The course involved self-directed learning and it is known from the demographic data that participants in the course were drawn from an educated cohort of learners. It therefore could be inferred that control-oriented individuals felt quite comfortable in this autonomy-supportive

environment. In other words, individuals who are control-oriented in general may act autonomously in an open education context.

**Research Question 4: For those who completed the course, do levels of basic psychological needs satisfaction (autonomy, competence, and relatedness) significantly increase during the duration of the course?** It was hypothesised that needs satisfaction would significantly increase as the learner progressed through the course. The results of the study did see a small but significant increase in competence with a small to moderate effect size. Meanwhile, autonomy and relatedness did not significantly increase. Therefore, the hypothesis was only partially supported.

A number of observations can be made about the data collected. For those who completed the course, mean levels of autonomy and competence began high and remained high. Meanwhile, mean levels of relatedness were proportionally lower, but were also maintained. The high levels of autonomy at the start of the course may have been a product of the demographic characteristics of the group, remembering that learners were generally highly educated. It is also possible that the very fact that participants had signed up for the course and were pursuing intrinsic life goals e.g., learning about psychological skills techniques to help with athletes with whom they work, contributed to feelings of autonomy. Goal contents theory (GCT; see Vansteenkiste et al., 2004), a sub-theory of self-determination theory, describes how the pursuit of intrinsic goals (e.g., personal growth through independent learning) is consistent with satisfaction of basic psychological needs. It is therefore possible that simply engaging with an open online course satisfies basic psychological needs, particularly autonomy. Thus, the role of the course designer and facilitator is to maintain those levels through synergistic autonomy-support.

It is encouraging that a significant increase in levels of competence was found. In other words, learners felt more effective in their understanding of psychological skills training techniques at the end of the course than at the beginning. It can be reasonably argued that this was in part due to the needs-supportive design of the course, through which special attention was given to authentic learning principles and in particular the sharing of expert knowledge, personal reflection, and real world problems that are encountered by sport psychologists working with elite athletes. Meanwhile, the online nature of the course lent itself to this authentic approach because learners had access to large amounts of expert knowledge and case studies e.g., through the open textbook *Secrets of Asian Sport Psychology* (Terry et al., 2014). Additionally, they were offered the opportunity to create a mental training program in a low risk environment through addressing the psychological issues presented in the authentic but virtual elite athlete personas.

Levels of relatedness although maintained, were proportionately lower than measured levels of autonomy and competence. Self-determination theory characterises relatedness in terms of close relationships, warm and caring communication, and a need to belong. Perhaps unsurprisingly, these social and interpersonal qualities are more challenging to address when designing an open online course in which participants are brought together asynchronously from around the world and encouraged to work at their own pace and in a self-directed fashion. Perhaps in the example of this particular course, there was a trade-off between relatedness and autonomy in spite of best efforts to create a rich communication environment in which learners felt respected and were encouraged by others.

Two caveats may be added to the implications of the results. First cognitive evaluation theory (CET, Deci, 1975), a sub-theory of self-determination theory, which



considers the social and environmental contexts related to intrinsic motivation, suggest that relatedness-support plays a distil role in facilitating intrinsic motivation. Individuals can be intrinsically motivated without the need for others to be nearby, but benefit from warm and caring communication when there is a social dimension to their activity. Second and concurring with the findings of Durksen et al. (2016), lower levels of relatedness would seemingly be a feature of online-mediated learning and in particularly large open online courses such as MOOCs. From an individual's perspective, it is perhaps impossible to authentically feel related to other learners or the course team in this specific online context.

The BPNOOES, which was validated using ESEM techniques from the data collected at T1, provided an acceptable fit to the hypothesised model implicit in the instrument. There was however a strong correlation between autonomy and competence, which it would seem is a feature of some empirical studies measuring basic psychological needs satisfaction (see Van den Broeck et al., 2016). For example, the self-endorsement item although more strongly correlated with autonomy in the model was also correlated with competence suggesting that simply self-endorsing an activity may contribute to perceptions of effectiveness. The strong relationship between autonomy and competence was also found in the MOOC study by Durksen et al. (2016), which used a different instrument to measure basic psychological needs satisfaction. Measuring basic psychological needs in an open online environment is a relatively novel context and therefore further research into their psychometric properties is warranted.

**Research Question 5: What qualities determined engagement or non-engagement in the course?** Self-report data collected from a post-course survey of participants provided a rich picture of intrinsic motivation, engagement, and positive

learner sentiment towards the course. The positive responses to the course engagement questionnaire and additional qualitative data were encouraging and contained emerging themes of interest and enjoyment, perceived competence, autonomy-support, and individual learning. Furthermore, many expressed praise and gratitude towards the course, perhaps because they had received a high quality learning experience at no financial cost and appreciated the efforts of the course team.

Meanwhile, empirical evidence of reasons for not participating in the course was gathered from non-participants and demonstrated that competing priorities and other salient life events undermined course engagement. Perhaps unsurprisingly, work or educational commitments were deemed more important than participating in the course, and even though a lack of time pressure was a feature of the course design, some participants reported that they were too busy to take part. No respondent felt that the course was uninteresting or not useful to them and it would also appear that the course was pitched at a reasonable level with only four participants feeling that the course was too challenging. A potential reason for this small number was possibly due to language issues given the geographical spread of learners.

**Summary.** The results of the present study capture a dynamic and rich picture of the second iteration of *Elite Sport Performance: Psychological Perspectives*. The data, when taken as a whole, provided evidence to support the design approach articulated in Study 2, which placed a strong emphasis of incorporating principles encompassed in self-determination theory to promote course engagement. Not least, the course comprehensively outperformed the first iteration of the course in every comparable engagement metric summarised in Study 1. Web analytic data, basic psychological needs measures, and post-course engagement surveys provided support to the assertion that the course was optimised to its open

online context and its self-determination principles. The final chapter of this thesis will provide a general discussion of the findings from the three studies, research limitations, and future directions for research.

## Chapter 6 - General Discussion

The purpose of the present research was to explore and evaluate the redesign of an open online course on applied techniques in the psychology of elite sport performance. There were two broad aims: firstly, to identify the key design features necessary to optimise the engagement and persistence of course participants; and secondly, to describe activity and engagement that took place within the open online course environment using self-determination theory as a lens of enquiry. In alignment with empirical predictions articulated in self-determination theory, it was hypothesised that focussing on supporting basic psychological needs would increase the likelihood of engagement in a context where the probability of dropout was high. In addition to the examination of engagement qualities, a further objective was to shed light on why individuals did not engage, in light of other empirical findings showing that a low completion rate is a normative phenomenon of an open online course.

Study 1 examined a first iteration of the course, predominantly using web analytics, thus providing data that evidenced non-optimal engagement and facilitated further critique of its design. Study 2 presented an innovative design intervention that drew upon principles articulated in self-determination theory and provided a step-by-step process that applied user-centred design techniques to offer an authentic learning experience. It also expanded upon the number of OERs created for the first iteration of the course, both by utilising existing licenced content and also via the further production of OERs for sharing with others. Finally, Study 3 provided a comprehensive empirical evaluation of the course both in terms of engagement through web analytics and also through measures used in self-determination theory

research, with a strong focus on needs satisfaction and intrinsically motivated behaviours.

The present research was innovative and contributed new knowledge in its applied approach to the design of a successful and engaging open online course. Within the discipline of sport psychology, there is a paucity of open access initiatives on this scale in spite of strong interest evidenced by the engagement metrics from this course. The present findings provide a template of design that others may follow in the future. The findings might be generalised more widely by providing an evidence-based approach to creating other open online courses. The research also addressed a gap in the literature, being the first systematic design and evaluation of an open online course specifically to utilise self-determination theory principles. This may be juxtaposed with enquiries that have evaluated courses using self-determination theory measures, though not explicitly using the theoretical principles in the inception and design (e.g., Durksen et al., 2016; Zhou, 2016). Finally, the research also adds to a growing body of literature that has applied this highly respected and empirically evidenced motivational theory (see Seligman & Csikszentmihalyi, 2000) to digital contexts such as online learning.

### **Summary of Findings**

The redesigned *Elite Sport Performance: Psychological Perspectives* was more effective in terms of learner engagement and persistence than the first iteration of the course. Furthermore, when benchmarked against the majority of MOOCs, the course performed significantly stronger in terms of completion rates. Testimony from those who completed the course was overwhelmingly positive with participant's self-reporting a range of benefits from taking the course. Post-course data evidenced a course that was interesting and enjoyable, both of which are indicators of intrinsically

motivated behaviour. Finally, an emphasis on providing a needs supportive environment to satisfy basic psychological needs appeared to be a useful design strategy in this unique educational context, where participants are more likely to discontinue than not.

Study 1 evaluated the first iteration of *Elite Sport Performance: Psychological Perspectives*, which was presented as a course in late 2013 and served to provide input data into a redesign. Its innovative pedagogy of discovery design (Taylor & Mackintosh, 2011), where learners are required to seek, critically analyse, and openly share knowledge online is highly relevant to the literacy skills required in the digital world in which we now live. However, in this particular context the course implementation was unsuccessful in terms of sustained engagement, with web analytic data providing strong evidence to show that engagement was relatively low and completely fell away as time progressed. In the absence of a post-course survey, there are a number of reasons that could be posited as to why it did not work and self-determination theory offers a useful lens of enquiry as summarised briefly below.

First, supporting information was not sufficient to sustain autonomous self-regulated learning (see Reeve, Ryan, Deci, & Jang, 2007). To put another way, the pedagogy of discovery in its inherent requirements to seek and evaluate open content was not scaffolded effectively in this particular context. It is very likely that learners did not feel sufficiently competent to progress with the course and therefore dropped out. Second, the WikiEducator interface was not an optimal tool for the delivery of learning content, despite its usefulness for the co-creation of knowledge (e.g., Wikipedia). For learners embarking on this particular course, the interface was cluttered and confusing and therefore likely undermined competence. Finally, the time imposition of the course undermined autonomy. All learning had to be

completed within a relatively short timeframe of six weeks and most likely some learners who were committed elsewhere dropped out due to the time pressure. Overall, the web analytic data openly shared by the OERu was helpful to the researcher in providing a narrative of the dynamics of this particular course and more importantly informed design decisions for the second iteration.

Study 2 provided a step-by-step account of the development of a new iteration of *Elite Sport Performance: Psychological Perspectives*. Its design was grounded in a self-determination theory perspective in which satisfaction of basic psychological needs was paramount in providing an optimal experience. The rationale behind this approach was that an open online course must be interesting and engaging, offer a clear pathway of learning, provide choice, and feel useful and beneficial. Of course, these are qualities that all courses should possess, but in context where learners give up their own time and are free to leave, that granular attention must be made to the course experience to increase the likelihood of effective and sustained engagement.

User-centred design approaches provided a useful set of tools to conduct this work, including developing user personas to build an internal frame of reference with regard to possible learners. Other techniques, including information mapping, wireframing, and usability testing, assisted in creating a coherent and immersive learning environment. In addition, great effort was taken to offer an authentic experience that would provide access to expertise and feel relevant to the world of elite sport. To the best knowledge of the researcher, the approach taken was a new innovation in design of open online courses in that it synthesised industry standard user-centred design approaches with authentic learning principles, all of which were underpinned by a robust motivational theory.

Study 3 presented the design intervention in a real world setting. The new iteration of *Elite Sport Performance: Psychological Perspectives* was evaluated in light of the findings of Study 1 and 2 and was generally successful in its implementation. Web analytics provided evidence of strong and sustained engagement, from a global cohort of learners. Basic psychological needs satisfaction was maintained in those who completed the course with a significant increase in competence. The growth in competence provided evidence to support the notion that those who persisted with the course perceived that their skills and knowledge had improved as a result of their participation.

Participants were drawn from many countries and tended to be highly educated. This may have been due to the way the course was advertised (i.e., mainly through professional and academic networks), but also corresponds to other research pointing to the overrepresentation of highly educated cohorts in open education who are extending skills and following interests (e.g., Christensen et al., 2013; Emanuel, 2013). Given that the philosophy of openness is one of inclusion and accessibility, it is slightly disappointing that participation was not broader in terms of educational achievement. Indeed a persona had been created in anticipation of learners with a general interest in sport, but it is possible that the marketing of the course did not tap into a wider interest group. Equally, the minimal representation of African countries was discouraging, but perhaps reflects that online education remains emergent until the continent's technical infrastructure improves. On a more positive note, the large representation of learners who expressed initial interest in the course because it would provide techniques for use with athletes was welcome. First, it validated the authentic learning principles and second, it provided an innovative and accessible way of disseminating sport psychology professional practice.



The engagement survey data collected after the official course completion provided evidence to support the design approach. Sentiment towards the course was positive and themes of interest and enjoyment, perceived benefit, and individual learning emerged. Such themes are congruent with the positive psychological outcomes articulated by self-determination theory when basic psychological needs are satisfied on an ongoing basis. Relatedness in the course remained problematic both in developing interpersonal relationships online and learner perceptions of belonging. Two associated issues are worth highlighting: First, the course was designed so that learners could start the course and progress at their own pace to support autonomy. Perhaps a trade-off to this feature is that all peer communication was asynchronous, which may not have provided sufficient real-time quality proximal interactions to satisfy relatedness needs. Second, the theory describes relatedness as a need for relationships that are warm and caring and may include family members, friends, and colleagues. A broader issue therefore is to whether these feelings can be authentically perceived in a digital environment, a research problem that other psychologists have examined in the context authenticity of relationships and behaviours in social media (e.g., Reinecke & Trepte, 2014; Seidman, 2013).

Predictably, the completion rate for *Elite Sport Performance: Psychological Perspectives* was low at around 20%, although this represented a considerable improvement on the first course and well exceeded the majority of MOOCs. Given that the issue of dropout remains contentious in terms of quality, the present research surveyed those who did not engage to elucidate reasons for not participating. A post-course survey of non-engagers found that other life pursuits were more salient to participating, as opposed to negative sentiment towards the course. High dropout rates are a norm of open online courses and therefore designers should anticipate this

phenomenon. The requirement of design therefore is to optimise the experience to maximise possible rates of participation. MOOCs for example, have huge cohorts of learners and even with low completion rates, many will derive benefits.

More generally, the findings of the present research support self-determination theory as a robust theory of human motivation and behaviour. Needs satisfaction techniques articulated in self-determination theory were applied in an open online education context and offered strong evidence of increased engagement and persistence when benchmarked against other courses, including the first iteration. These findings are consistent with understandings of needs support in other educational contexts (e.g., Jang, Kim, & Reeve, 2016; Vallerand, Fortier, & Guay, 1997) and also the axiom that autonomy, competence, and relatedness are evolved universal needs necessary for optimal functioning in many life domains (Deci & Ryan, 2000).

Participants who engaged with the course had a meaningful experience. They reported indicators of positive functioning including experienced benefit, interest and enjoyment, and maintained high levels of autonomy and competence. If these experiences are generalised across MOOCs or indeed any other types of non-formal learning where the external pressures of formal education are not present, then involvement may contribute to positive well-being. Self-determination theory articulates a eudaimonic perspective of well-being where satisfaction of basic psychological needs coupled with the pursuit of intrinsic life goals may lead to personal growth and happiness. In this particular course, many learners reported intrinsic goals such as wanting to learn more about psychological skills training techniques for later use with athletes that they work. It is these intrinsic pursuits,

where extrinsic rewards such as money or contingent recognition from others are not relevant, that are central to eudaimonic well-being.

A surprising finding from the present research was that causality orientations did not predict persistence in the course. One possible interpretation of this finding was that the course design with its focus on supporting basic psychological needs offset causality orientations that may have stronger causal properties in other contexts where external pressures were more salient. It would seem that open online courses, if designed to limit contingencies and controls and also to promote needs satisfaction, offer universal opportunities to learn and grow.

Returning to the Pew Report mentioned in the introduction to the present research (Horrigan, 2016), 73% of American respondents considered themselves as lifelong learners. However, the report also identified that 80% were unaware of MOOCs as a possible route to learning in spite of the potential benefits on offer in a less formal educational environment. The present research also demonstrated that those less well educated or from a less privileged part of the world were underrepresented, which is consistent with other research looking at the profiles of learners in open online courses (e.g., Emanuel, 2013; Stich & Reeves, 2017; Zhenghao et al., 2015). It would seem that more work is needed to raise awareness of these types of courses, and to ensure that learners are optimally supported in these environments.

When findings are considered collectively, 10 recommendations are provided below that focus on some of the key design features of an optimised open online course. Although these recommendations are derived from the work undertaken in the present research it is anticipated that they could be generalised more widely:

1. Understand that the context of open education is very different to formal and traditional approaches.
2. Consider design features that specifically support basic psychological needs to foster high quality motivation and engagement.
3. Place the user experience at the heart of the design by utilising best practice design techniques.
4. Create personas to develop an internal frame of reference about course participants and their reasons and intentions for enrolling on the course.
5. Focus on developing authentic activities that are both interesting and enjoyable and are perceived as beneficial e.g., a new skill that can be applied in a real world context.
6. Provide structure and scaffolding that builds to a meaningful final activity.
7. Attention to visual design and usability is essential.
8. Utilise web analytics to provide insights on online behaviours and use these insights to inform future design.
9. Meeting the basic psychological need of relatedness is perhaps the most challenging in online environments, therefore place close attention to this matter.
10. Understand that most participants will withdraw from the course, because life gets in the way and other matters become more salient. The designer's role is to mitigate against attrition via the optimisation of the online experience to increase the chances of persistence.

### **Contributions of the Research to the Literature**

The findings of this thesis make a number of useful contributions to the research literature particularly if framed around the question *what do we know that is*

*important to know?* Although a number of contributions have already been indicated in the present chapter, three are worth highlighting further below.

First, whilst acknowledging the limitations of web analytics, the present research combines web analytic tools with other instruments such as the BPNOOES to evaluate the design and development of an open online course. The blending of a range of approaches underpinned by a well-established psychological theory reveals more about the dynamics of open online courses such as *Elite Sport Performance: Psychological Perspectives*. Furthermore, as more complex human activity continues to migrate online (e.g., how we learn, work, and entertain ourselves), research approaches that provide psychological insights into human online behaviour are paramount, and the present research provides one such example.

Second, a design framework for open online courses that synthesises key tenets of self-determination theory with best practice in web and learning design has been proposed and evaluated in the present research. Whilst acknowledging a degree of caution, evidence has been presented to demonstrate that self-determination theory is a valuable lens through which to understand engagement with open online courses. This is perhaps not surprising given that the theory has shown great utility in a multitude of life domains including education, health and exercise, the world of work, and virtual worlds (Ryan & Deci, 2017).

Third, a key set of recommendations in the design of open online courses is proposed that others further test and evaluate in the future. In particular, the 10 recommendations presented above are evidence-based and represent a deep understanding of the context of open education and the range of salience that participants place upon it. Open education is not a replacement for formal education, but it can act in parallel to offer new opportunities to learn in a low risk environment.

However, design approaches must mature as our understandings of the strength and weaknesses of open education advance over time.

### **Limitations and Future Directions**

Conducting psychological research in an open online educational environment is not without challenges and limitations. The environment in which the research was conducted was dynamic and involved real world activity as opposed to experimental conditions. For example, unlike an experimental research context, most participants dropped out and some did not complete all the repeated measures questionnaires. Furthermore, the cohort was diverse from many parts of the world and different cultural backgrounds. Web analytics showed that many learners came from countries in which English was not a first language, although many of the most represented countries such as Singapore and Malaysia have high rates of English proficiency. Given that the course was only in English and all measures were English language versions, the data were likely sourced from those who were proficient in English. However, there is also the possibility that those who were less proficient dropped out or did not complete scales. For example, web analytic data showed that Chinese participants were less represented than might be expected, and this is most likely due to the course being English language-based. It is understood that the course was accessible in China as opposed to being subject to national access restrictions.

The psychometric properties of the GCOS and IMI were not investigated in this thesis. Both are relatively old scales dating from the 1980s, and although well validated in the past have not been subject to the advanced techniques available to today's researchers. Perhaps therefore it is time for researchers to assess and further refine those scales. This suggestion is in keeping with a recent observation made by Ryan and Deci (2017) when reviewing over forty years of the development of self-

determination theory. Specifically, they propose that “the psychometric infrastructure of SDT, which has been an important bridge between theory and observations in both experimental and field settings, is in some domains in need of a bit of repair” (p. 196). Perhaps some self-determination researchers would agree, but any such work done in the future is also testament to the increasing utility of self-determination theory in multiple domains in the modern world.

The BPNOOES embedded into the course performed satisfactorily in terms of validity and reliability. However given the new context in which they were utilised, the scale should be deployed again in future online research to further discriminate its psychometric properties and understand its sensitivity to measuring basic psychological needs in open online environments. Unfortunately there were no normative data available with which to compare the BPNOOES scores, so further research into needs satisfaction levels in open online courses would be welcome. Nevertheless, the measures were in keeping Durksen’s (2016) MOOC study which reported relatively high scores for autonomy and competence and proportionally lower scores for relatedness.

The salience of the certificate of completion in the course was unexpected and ultimately was not satisfactorily examined in the present research. Did the certificate take on a more instrumental role than anticipated and therefore represent an example of differentiated forms of motivation in course completers? For example, was identified regulated motivation present even though the course design was solely intended to foster intrinsic motivation? One possible approach to take in any future research would be to assess the different types of motivation present using a relevant scale. One possible instrument is the Learning Self-Regulation Questionnaire (SRQ-L; Black & Deci, 2000), which assesses whether learners are engaging for

autonomous or controlled reasons. Another possibility is to adapt the Multidimensional Work Motivation Scale (MWMS; Gagné et al., 2015) to an open educational context, which has excellent psychometric properties and can discriminate between different forms of motivation.

An interesting avenue for future investigation that was not directly assessed in the present research would be to more specifically examine life goals as well as perceived eudaimonic well-being. The present research offered some indicative evidence that participating in an open online course was synergistic with intrinsic life goals e.g., personal growth through the development of useful new knowledge and skills. It follows that types of activities where learning is pursued for its inherent qualities contributes to eudaimonic well-being. Further work could incorporate instruments that attempt to measure goal contents and well-being of MOOC engagers more closely to further cement these findings. For example, the Aspirations Index (Kasser & Ryan, 1996) coupled with the Satisfaction With Life Scale (SWLS; Diener et al., 1985) or the Flourishing Scale (FS; Diener et al., 2010) could be incorporated into future research to better understand the possible well-being benefits accrued through partaking in open online courses.

## **Conclusion**

The second iteration of *Elite Sport Performance: Psychological Perspectives* offers an empirically evaluated example of an open online course that has incorporated the satisfaction of universal basic psychological needs into the heart of its design. It represents recognition that open education is very different to traditional approaches; many salient features of mainstream education simply do not come into play. The present research has contributed evidence of a design approach that can be followed by others, blending self-determination theory with user-centred design



approaches to provide an authentic and engaging learning experience. Within the field of sport psychology, open access initiatives such as this one offer real opportunities for the discipline to reach out to a wider audience. Professional sport plays an important role in the cultural fabric of our lives, the excellence in skill coupled with a winning mind, creates drama on the sporting field and plenty of media attention. The intention of the course was to provide a taste of the theoretical and applied knowledge required of a sport psychologist working with elite athletes. Understanding the psychological skills that are necessary to win at the highest level it would seem is of great interest to many as demonstrated by this course. Although it offered no formal qualification, it was hoped that *Elite Sport Performance: Psychological Perspectives* would inspire some to follow their interest in the discipline, possibly leading to more study, or even a future professional career.

As an OER, the course was reopened for anyone to access following the official presentation of the course, and to date more than 200 new registrations have accrued. Some of the findings of this research have been presented at the Self-Determination Theory Conference in Canada and the pre-Paralympic International Convention on Science, Education, and Medicine in Sport (ICSEMIS) in Brazil. Furthermore, the course is presently under consideration for a return to the OERu in 2017 as one of their official courses, through which learners can gain accreditation if they wish. It is this spirit of openness and sharing that lies at the core of this program of work and it is hoped that many will benefit.

## References

- About ASPASP. (n.d.). Retrieved from <http://www.aspasp.org/about-aspasp/>
- About benchmarking. (n.d.). Retrieved from <https://support.google.com/analytics/answer/6086666>
- Adie, J. W., Duda, J. L., & Ntoumanis, N. (2008). Autonomy support, basic need satisfaction and the optimal functioning of adult male and female sport participants: A test of basic needs theory. *Motivation and Emotion, 32*, 189-199. doi:10.1007/s11031-008-9095-z
- Aelterman, N., Vansteenkiste, M., Van Keer, H., & Haerens, L. (2016). Changing teachers' beliefs regarding autonomy support and structure: The role of experienced psychological need satisfaction in teacher training. *Psychology of Sport and Exercise, 23*, 64-72. doi:10.1016/j.psychsport.2015.10.007
- Agawa, T., & Takeuchi, O. (2016). Validating self-determination theory in the Japanese EFL context: Relationship between innate needs and motivation. *The Asian EFL Journal Quarterly, 18*(1), 7-33. Retrieved from <https://www.elejournals.com/1342/2016/asian-efl-journal/the-asian-efl-journal-quarterly-march-2016/>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211. doi:10.1016/0749-5978(91)90020-t
- Alexander, B. (2008, July 10). Connectivism course draws night, or behold the MOOC [Web log post]. Retrieved from <http://infocult.typepad.com/infocult/2008/07/connectivism-course-draws-night-or-behold-the-mooc.html>

- Amabile, T. M., DeJong, W., & Lepper, M. R. (1976). Effects of externally imposed deadlines on subsequent intrinsic motivation. *Journal of Personality and Social Psychology, 34*, 92-98. doi:10.1037/0022-3514.34.1.92
- Anderson, T. (2013). Open access scholarly publications as OER. *The International Review of Research in Open and Distributed Learning, 14*(2), 81-95. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1531/2517>
- Ardito, C., Costabile, M. F., Marsico, M. D., Lanzilotti, R., Levialedi, S., Roselli, T., & Rossano, V. (2006). An approach to usability evaluation of e-learning applications. *Universal Access in the Information Society, 4*, 270-283. doi:10.1007/s10209-005-0008-6
- Asparouhov, T., & Muthén, B. (2009). Exploratory structural equation modeling. *Structural Equation Modeling: A Multidisciplinary Journal, 16*, 397-438. doi:10.1080/10705510903008204
- Assor, A., Kaplan, H., & Roth, G. (2002). Choice is good, but relevance is excellent: Autonomy-enhancing and suppressing teacher behaviours predicting students' engagement in schoolwork. *British Journal of Educational Psychology, 72*, 261-278. doi:10.1348/000709902158883
- Baard, P. P. (2002). Intrinsic need satisfaction in organizations: A motivational basis of success in for-profit and not-for-profit settings. In E. L. Deci & M. R. Ryan (Eds.), *Handbook of self-determination research* (pp. 255-275). Rochester, NY: The University of Rochester Press.
- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal*

*of Applied Social Psychology*, 34, 2045-2068. doi:10.1111/j.1559-1816.2004.tb02690.x

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change.

*Psychological Review*, 84, 191-215. doi:10.1037/0033-295X.84.2.191

Bandura, A. (1995). Exercise of personal and collective efficacy in changing

societies. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 1-45).

Cambridge, United Kingdom: Cambridge University Press.

Bates, T. (2012, August 5). What's right and what's wrong about Coursera-style

MOOCs [Web log post]. Retrieved from

<http://www.tonybates.ca/2012/08/05/whats-right-and-whats-wrong-about-coursera-style-moocs/>

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for

interpersonal attachments as a fundamental human motivation. *Psychological*

*Bulletin*, 117, 497-529. doi:10.1037/0033-2909.117.3.497

Beasley, M. (2013). *Practical web analytics for user experience* (1<sup>st</sup> ed.). Burlington,

MA: Morgan Kaufman.

Beaven, T., Codreanu, T., & Creuzé, A. (2014). Motivation in a language MOOC:

issues for course designers. In E. Martín-Monje & E. Bárcena (Eds.), *Language*

*MOOCs: Providing learning, transcending boundaries* (pp. 48-66). Berlin,

Germany: De Gruyter Open.

Beaven, T., Hauck, M., Comas-Quinn, A., Lewis, T., & de los Arcos, B. (2014).

MOOCs: Striking the right balance between facilitation and self-determination.

*Journal of Online Learning and Teaching*, 10, 31-43. Retrieved from

[http://jolt.merlot.org/vol10no1/beaven\\_0314.pdf](http://jolt.merlot.org/vol10no1/beaven_0314.pdf)

Benware, C. A., & Deci, E. L. (1984). Quality of learning with an active versus passive motivational set. *American Educational Research Journal*, 21, 755-765.  
doi:10.3102/00028312021004755

Bergstrom, J. R. (2013, April 2). Moderating usability tests [Web log post]. Retrieved from <http://www.usability.gov/get-involved/blog/2013/04/moderating-usability-tests.html>

Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education*, 84, 740-756.  
doi:10.1002/1098-237X(200011)84:6<740::AID-SCE4>3.0.CO;2-3

Blaschke, L. M. (2012). Heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. *The International Review of Research in Open and Distributed Learning*, 13(1), 56-71. doi:10.19173/irrodl.v13i1.1076

Blevins, C. E., Banes, K. E., Walker, D. D., Stephens, R. S., & Roffman, R. A. (2016). The relationship between general causality orientation and treatment outcome among marijuana-dependent adults. *Addictive Behaviors*, 53, 196-200.  
doi:10.1016/j.addbeh.2015.10.021

Boag, P. (2013, May 13). Why user personas are not enough [Web log post]. Retrieved from <http://boagworld.com/design/user-personas/>

Bonneville-Roussy, A., Vallerand, R. J., & Bouffard, T. (2013). The roles of autonomy support and harmonious and obsessive passions in educational

persistence. *Learning and Individual Differences*, 24, 22-31.

doi:10.1016/j.lindif.2012.12.015

Brent, I., Gibbs, G., & Gruszczynska, A. (2012). Obstacles to creating and finding Open Educational Resources: the case of research methods in the social sciences. *Journal of Interactive Media in Education*, 2012(1).

doi:10.5334/2012-05

Brien, M., Forest, J., Mageau, G. A., Boudrias, J.-S., Desrumaux, P., Brunet, L., & Morin, E. M. (2012). The Basic Psychological Needs at Work Scale: Measurement invariance between Canada and France. *Applied Psychology: Health and Well-Being*, 4, 167-187. doi:10.1111/j.1758-0854.2012.01067.x

Britton, P. C., Patrick, H., Wenzel, A., & Williams, G. C. (2011). Integrating motivational interviewing and self-determination theory with cognitive behavioral therapy to prevent suicide. *Cognitive and Behavioral Practice*, 18, 16-27. doi:10.1016/j.cbpra.2009.06.004

Brown, J. S., & Adler, R. P. (2008). Open education, the long tail, and learning 2.0. *Educause Review*, 43(1), 16-20. Retrieved from <https://net.educause.edu/ir/library/pdf/ERM0811.pdf>

Browne, M. W. (2001). An overview of analytic rotation in exploratory factor analysis. *Multivariate Behavioral Research*, 36, 111-150. doi:10.1207/S15327906MBR3601\_05

Calvo, R. A., & Peters, D. (2014). *Positive computing: Technology for well-being and human potential*. Cambridge, MA: MIT Press.

Ceaparu, I., Lazar, J., Bessiere, K., Robinson, J., & Shneiderman, B. (2004).

Determining causes and severity of end-user frustration. *International Journal of Human-Computer Interaction*, 17, 333-356.

doi:10.1207/s15327590ijhc1703\_3

Chang, R., Ziemkiewicz, C., Green, T. M., & Ribarsky, W. (2009). Defining insight for visual analytics. *IEEE Computer Graphics and Applications*, 29(2), 14-17.

doi:10.1109/MCG.2009.22

Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-

Deeder, J., . . . Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and emotion*, 39,

216-236. doi:10.1007/s11031-014-9450-1

Chen, H., Chiang, R. H. L., & Storey, V. C. (2012). Business intelligence and

analytics: from big data to big impact. *MIS Quarterly*, 36, 1165-1188. Retrieved from <http://www.misq.org/contents-36-4/>

Chen, K.-C., & Jang, S.-J. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior*, 26, 741-752.

doi:10.1016/j.chb.2010.01.011

Chen, S.-H., Nasongkhla, J., & Donaldson, A. J. (2015). From vision to action – a

strategic planning process model for Open Educational Resources. *Procedia - Social and Behavioral Sciences*, 174, 3707-3714.

doi:10.1016/j.sbspro.2015.01.1103

- Chirkov, V. I. (2009). A cross-cultural analysis of autonomy in education: A self-determination theory perspective. *Theory and Research in Education*, 7, 253-262. doi:10.1177/1477878509104330
- Choi, J., Noh, G.-Y., & Park, D.-J. (2014). Smoking cessation apps for smartphones: Content analysis with the self-determination theory. *Journal of Medical Internet Research*, 16(2). doi:10.2196/jmir.3061
- Christensen, G., Steinmetz, A., Alcorn, B., Bennett, A., Woods, D., & Emanuel, E. J. (2013). The MOOC phenomenon: Who takes massive open online courses and why? *SSRN Electronic Journal*. doi:10.2139/ssrn.2350964
- Clow, D. (2013). MOOCs and the funnel of participation. In *Proceedings of the Third International Conference on Learning Analytics and Knowledge* (pp. 185-189). doi:10.1145/2460296.2460332.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: L Erlbaum Associates.
- Conole, G. (2016). MOOCs as disruptive technologies: Strategies for enhancing the learner experience and quality of MOOCs. *Revista de Educación a Distancia*, 50. doi:10.6018/red/50/2
- Cook, M. (n.d.). State of the MOOC 2016: A year of massive landscape change for Massive Open Online Courses. Retrieved from <http://www.onlinecoursereport.com/state-of-the-mooc-2016-a-year-of-massive-landscape-change-for-massive-open-online-courses/>



Cooper, S., Lavaysse, L. M., & Gard, D. E. (2015). Assessing motivation orientations in schizophrenia: Scale development and validation. *Psychiatry Research*, 225, 70-78. doi:10.1016/j.psychres.2014.10.013

Cormier, D. (2008, October 2). The CCK08 MOOC - Connectivism course, 1/4 way [Web log post]. Retrieved from <http://davecormier.com/edblogger/2008/10/02/the-cck08-mooc-connectivism-course-14-way/>

Coughlan, S. (2015, May 13). UK 'biggest online university course'. Retrieved from <http://www.bbc.com/news/education-32721056>

Creative Commons (n.d.). Education/OER. Retrieved from <https://creativecommons.org/about/program-areas/education-oer/>

Creech, A. (2010). Learning a musical instrument: The case for parental support. *Music Education Research*, 12, 13-32. doi:10.1080/14613800903569237

Csikszentmihalyi, M. (1991). *Flow: The psychology of optimal experience*. New York, NY: Harper Perreniel.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.

Dabbagh, N., Benson, A. D., Denham, A., Joseph, R., Al-Freih, M., Zgheib, G., . . .

Guo, Z. (2016). *Learning technologies and globalization: Pedagogical frameworks and applications*. Cham, Switzerland: Springer International Publishing.

Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education*, 2012(3).

doi:10.5334/2012-18

Darbyshire, P. (1993). In defence of pedagogy: A critique of the notion of andragogy.

*Nurse Education Today*, 13, 328-335. doi:10.1016/0260-6917(93)90072-A

Day, A., Paquet, S., Scott, N., & Hambley, L. (2012). Perceived information and communication technology (ICT) demands on employee outcomes: The

moderating effect of organizational ICT support. *Journal of Occupational*

*Health Psychology*, 17, 473-491. doi:10.1037/a0029837

De Angeli, A., Sutcliffe, A., & Hartmann, J. (2006). Interaction, usability and

aesthetics: What influences users' preferences? In *Proceedings of the Sixth Conference on Designing Interactive Systems* (pp. 271-280).

doi:10.1145/1142405.1142446

de Freitas, S. I., Morgan, J., & Gibson, D. (2015). Will MOOCs transform learning and teaching in higher education? Engagement and course retention in online

learning provision. *British Journal of Educational Technology*, 46, 455-471.

doi:10.1111/bjet.12268

de los Arcos, B., Farrow, R., Pitt, R., Weller, M., & McAndrew, P. (2016).

Personalising learning through adaptation: Evidence from a global survey of K-

12 teachers' perceptions of their use of open educational resources. *Journal of Online Learning Research*, 2(1), 23-40. Retrieved from

<http://oro.open.ac.uk/46145/>

- deCharms, R. (1968). *Personal causation: the internal affective determinants of behavior*. New York, NY: Academic Press.
- Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology, 18*, 105-115.  
doi:10.1037/h0030644
- Deci, E. L. (1975). *Intrinsic motivation*. New York, NY: Plenum Press.
- Deci, E. L., Connell, J. P., & Ryan, R. M. (1989). Self-determination in a work organization. *Journal of Applied Psychology, 74*, 580-590.  
doi:10.1037/0021-9010.74.4.580
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological Bulletin, 125*, 627-668. doi:10.1037/0033-2909.125.6.627
- Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. In L. Berkowitz (Ed.) *Advances in experimental social psychology* (Vol. 13, pp. 39-80). New York, NY: Academic Press.
- Deci, E. L., & Ryan, R. M. (1985a). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality, 19*, 109-134.  
doi:10.1016/0092-6566(85)90023-6
- Deci, E. L., & Ryan, R. M. (1985b). *Intrinsic motivation and self-determination in human behavior*. New York, NY: Plenum Press.

- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227-268. doi:10.1207/S15327965PLI1104\_01
- Deci, E. L., & Ryan, R. M. (2002). Overview of self-determination theory: An organismic dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3-33). Rochester, NY: University Rochester Press.
- Deci, E. L., & Ryan, R. M. (2008a). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology, 49*, 14-23. doi:10.1037/0708-5591.49.1.14
- Deci, E. L., & Ryan, R. (2008b). Hedonia, eudaimonia, and well-being: An introduction. *Journal of Happiness Studies, 9*, 1-11.  
doi:10.1007/s10902-006-9018-1
- Deci, E. L., & Ryan, R. M. (2010). Self-Determination. In I. B. Weiner & W. E. Craighead (Eds.), *Corsini encyclopedia of psychology* (4<sup>th</sup> ed., pp. 1-2). London, United Kingdom: John Wiley & Sons.
- Deci, E. L., & Ryan, R. M. (2014a). Autonomy and need satisfaction in close relationships: Relationships motivation theory. In N. Weinstein (Ed.), *Human motivation and interpersonal relationships: Theory, research and applications* (pp. 53-73). Dordrecht, Netherlands: Springer Netherlands.
- Deci, E. L., & Ryan, R. M. (2014b). The importance of universal psychological needs for understanding motivation in the workplace. In M. Gagné (Ed.), *The Oxford*

*handbook of work engagement, motivation, and self-determination theory* (pp. 13-32). Oxford, United Kingdom: Oxford University Press.

Deci, E. L., & Ryan, R. M. (2016). Optimizing students' motivation in the era of testing and pressure: A self-determination theory perspective. In C. W. Liu, K. J. C. Wang, & R. M. Ryan (Eds.), *Building autonomous learners: Perspectives from research and practice using self-determination theory* (pp. 9-29). Singapore: Springer Singapore.

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, 27, 930-942.  
doi:10.1177/0146167201278002

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist*, 26, 325-346. doi:10.1207/s15326985ep2603&4\_6

Deterding, S. (2015). The lens of intrinsic skill atoms: A method for gameful design. *Human-Computer Interaction*, 30, 294-335.  
doi:10.1080/07370024.2014.993471

Dewey, J. (1930). *Democracy and education: An introduction to the philosophy of education*. Penn State Electronic Classics Series Publication. Retrieved from [https://archive.org/download/DemocracyAndEducation\\_201507/Democracy\\_And\\_Education.pdf](https://archive.org/download/DemocracyAndEducation_201507/Democracy_And_Education.pdf).

- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, 49, 71-75.  
doi:10.1207/s15327752jpa4901\_13
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D.-w., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, 97, 143-156.  
doi:10.1007/s11205-009-9493-y
- Downes, S. (2013, May 13). Week 2: The quality of Massive Open Online Courses by Stephen Downes. Retrieved from <http://mooc.efuel.org/week-2-the-quality-of-massive-open-online-courses-by-stephen-downes/>
- Dreampress 2. (n.d.). Retrieved from <https://www.dreamhost.com/hosting/wordpress/>
- Durksen, T. L., Chu, M.-W., Ahmad, Z. F., Radil, A. I., & Daniels, L. M. (2016). Motivation in a MOOC: A probabilistic analysis of online learners' basic psychological needs. *Social Psychology of Education*, 19, 241-260.  
doi:10.1007/s11218-015-9331-9
- Emanuel, E. J. (2013). Online education: MOOCs taken by educated few. *Nature*, 503, 342-342. doi:10.1038/503342a
- Fagan, J. C. (2014). The suitability of web analytics key performance indicators in the academic library environment. *The Journal of Academic Librarianship*, 40, 25-34. doi:10.1016/j.acalib.2013.06.005
- Falconer, I., McGill, L., Littlejohn, A., Boursinou, E., & Punie, Y. (2013). *Overview and analysis of practices with Open Educational Resources in adult education*

- in Europe*. Luxemburg: European Commission. Retrieved from <http://ftp.jrc.es/EURdoc/JRC85471.pdf>
- Farney, T., & McHale, N. (2013). *Web analytics strategies for information professionals: A LITA guide*. Chicago, IL: ALA TechSource.
- Fenton, S. A. M., Duda, J. L., & Barrett, T. (2016). Optimising physical activity engagement during youth sport: A self-determination theory approach. *Journal of Sports Sciences*, *34*, 1874-1884. doi:10.1080/02640414.2016.1142104
- Field, A. (2013). *Discovering statistics using IBM SPSS Statistics*. London, United Kingdom: SAGE Publications.
- Frey, C. B., & Osborne, M. (2013). *The future of employment: How susceptible are jobs to computerisation?* Oxford, United Kingdom: Oxford Martin School. Retrieved from <http://www.oxfordmartin.ox.ac.uk/downloads/academic/future-of-employment.pdf>
- Friedlander, B. Z. (1975). Some remarks on "Open Education". *American Educational Research Journal*, *12*, 465-468. doi:10.2307/1162746
- Friesen, N. (2013). Realising the open in Open Educational Resources: Practical concerns and solutions. In R. McGreal, W. Kinuthia, & S. Marshall (Eds.), *Perspectives on open and distance learning: Open Educational Resources: Innovation, research and practice* (pp. 79-90). Vancouver, Canada: Commonwealth of Learning and Athabasca University.
- Gabriel-Petit, P. (2010, July 19). Design is a process, not a methodology [Web log post]. Retrieved from <http://www.uxmatters.com/mt/archives/2010/07/design-is-a-process-not-a-methodology.php>

- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*, 331-362. doi:10.1002/job.322
- Gagné, M., Forest, J., Vansteenkiste, M., Crevier-Braud, L., Van den Broeck, A., Aspeli, A. K., . . . Westbye, C. (2015). The Multidimensional Work Motivation Scale: Validation evidence in seven languages and nine countries. *European Journal of Work and Organizational Psychology, 24*, 178-196. doi:10.1080/1359432X.2013.877892
- Gilligan, J., Chen, W., Kelle, S., & Darzentas, J. (November, 2015). *MOOCA: Massive Open Online Course for Accessibility*. Paper presented at Universal Design in Education Conference, Dublin Institute of Technology, Dublin, Ireland. Retrieved from <http://arrow.dit.ie/exdesthe1/4/>
- Gourlay, L. (2015). Open education as a 'heterotopia of desire'. *Learning, Media and Technology, 40*, 310-327. doi:10.1080/17439884.2015.1029941
- Grodecka, K., & Śliwowski, K. (2014). *Open Educational Resources mythbusting*. Retrieved from <https://oerknowledgecloud.org/content/oer-mythbusting>
- Guadagnoli, M. A., & Lee, T. D. (2004). Challenge point: A framework for conceptualizing the effects of various practice conditions in motor learning. *Journal of Motor Behavior, 36*, 212-224. doi:10.3200/JMBR.36.2.212-224
- Guiffrida, D. A., Lynch, M. F., Wall, A. F., & Anel, D. S. (2013). Do reasons for attending college affect academic outcomes? A test of a motivational model from a self-determination theory perspective. *Journal of College Student Development, 54*, 121-139. doi:10.1353/csd.2013.0019



- Gunnell, K. E., Crocker, P. R. E., Mack, D. E., Wilson, P. M., & Zumbo, B. D. (2014). Goal contents, motivation, psychological need satisfaction, well-being and physical activity: A test of self-determination theory over 6 months. *Psychology of Sport and Exercise, 15*, 19-29.  
doi:10.1016/j.psychsport.2013.08.005
- Güntert, S. T., Strubel, I. T., Kals, E., & Wehner, T. (2016). The quality of volunteers' motives: Integrating the functional approach and self-determination theory. *The Journal of Social Psychology, 156*, 310-327.  
doi:10.1080/00224545.2015.1135864
- Hagger, M. S., & Chatzisarantis, N. L. D. (2009). Integrating the theory of planned behaviour and self-determination theory in health behaviour: A meta-analysis. *British Journal of Health Psychology, 14*, 275-302.  
doi:10.1348/135910708X373959
- Hagger, M. S., & Chatzisarantis, N. L. D. (2011). Causality orientations moderate the undermining effect of rewards on intrinsic motivation. *Journal of Experimental Social Psychology, 47*, 485-489. doi:10.1016/j.jesp.2010.10.010
- Hagger, M. S., Koch, S., & Chatzisarantis, N. L. D. (2015). The effect of causality orientations and positive competence-enhancing feedback on intrinsic motivation: A test of additive and interactive effects. *Personality and Individual Differences, 72*, 107-111. doi:10.1016/j.paid.2014.08.012
- Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison,

satisfaction, effort, and academic performance. *Computers & Education*, 80, 152-161. doi:10.1016/j.compedu.2014.08.019

Harackiewicz, J. M., Abrahams, S., & Wageman, R. (1987). Performance evaluation and intrinsic motivation: The effects of evaluative focus, rewards, and achievement orientation. *Journal of Personality and Social Psychology*, 53, 1015-1023. doi:10.1037/0022-3514.53.6.1015

Hartmann, J., Sutcliffe, A., & De Angeli, A. (2008). Towards a theory of user judgment of aesthetics and user interface quality. *ACM Transactions on Computer-Human Interaction*, 15(4), 1-30. doi:10.1145/1460355.1460357

Hassenzahl, M. (2008). User experience (UX): Towards an experiential perspective on product quality. In *Proceedings of the 20th International Conference of the Association Francophone d'Interaction Homme-Machine* (pp. 11-15). doi:10.1145/1512714.1512717

Hassenzahl, M., & Tractinsky, N. (2006). User experience - a research agenda. *Behaviour & Information Technology*, 25, 91-97. doi:10.1080/01449290500330331

Heider, F. (1958). *The psychology of interpersonal relations*. New York, NY: Wiley.

Herrington, J., & Kervin, L. (2007). Authentic learning supported by technology: Ten suggestions and cases of integration in classrooms. *Educational Media International*, 44, 219-236. doi:10.1080/09523980701491666

Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, 48(3), 23-48. doi:10.1007/bf02319856

Herrington, J., Reeves, T. C., & Oliver, R. (2010). *A guide to authentic e-learning*.

New York, NY: Routledge.

Herrington, J., Reeves, T. C., & Oliver, R. (2014). Authentic learning environments.

In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 401-412). New York, NY: Springer New York.

Hew, K. F. (2015). Towards a model of engaging online students: lessons from

MOOCs and four policy documents. *International Journal of Information and Education Technology*, 5, 425-431. doi:10.7763/IJiet.2015.V5.543

Hew, K. F. (2016). Promoting engagement in online courses: What strategies can we

learn from three highly rated MOOCs. *British Journal of Educational Technology*, 47, 320-341. doi:10.1111/bjet.12235

Horrigan, J. B. (2016). *Lifelong learning and technology*. Retrieved from

[http://www.pewinternet.org/files/2016/03/PI\\_2016.03.22\\_Educational-Ecosystems\\_FINAL.pdf](http://www.pewinternet.org/files/2016/03/PI_2016.03.22_Educational-Ecosystems_FINAL.pdf)

Houde, J. (February, 2006). *Andragogy and motivation: An examination of the*

*principles of andragogy through two motivation theories*. Paper presented at the Academy of Human Resource Development International Conference (AHRD), Columbus, Ohio. Retrieved from <http://eric.ed.gov/?id=ED492652>

How Sampling Works. (2016). Retrieved from

<https://support.google.com/analytics/answer/2637192>

Hull, C. L. (1943). *Principles of behavior: An introduction to behavior theory*.

Oxford, United Kingdom: Appleton-Century.

- Huta, V., & Waterman, A. S. (2014). Eudaimonia and its distinction from hedonia: Developing a classification and terminology for understanding conceptual and operational definitions. *Journal of Happiness Studies, 15*, 1425-1456.  
doi:10.1007/s10902-013-9485-0
- Illich, I. (1971). *Deschooling society* (1<sup>st</sup> ed.). London, United Kingdom: Calder & Boyars.
- International Organization for Standardization (2010). *Ergonomics of human system interaction-Part 210: Human-centred design for interactive systems (ISO 9241-210: 2010)*. Retrieved from  
[http://www.iso.org/iso/catalogue\\_detail.htm?csnumber=52075](http://www.iso.org/iso/catalogue_detail.htm?csnumber=52075).
- Jang, H., Kim, E. J., & Reeve, J. (2016). Why students become more engaged or more disengaged during the semester: A self-determination theory dual-process model. *Learning and Instruction, 43*, 27-38.  
doi:10.1016/j.learninstruc.2016.01.002
- Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*, 588-600. doi:10.1037/a0019682
- Jang, H., Reeve, J., & Halusic, M. (2016). A new autonomy-supportive way of teaching that increases conceptual learning: Teaching in students' preferred ways. *The Journal of Experimental Education, 84*, 686-701.  
doi:10.1080/00220973.2015.1083522

- Jones, S. (2015, October 28). What is referrer spam and how do you get rid of it? [Web log post]. Retrieved from <https://www.searchenginejournal.com/referrer-spam-get-rid/135855/>
- Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *The International Review of Research in Open and Distributed Learning, 15*(1), 133-160. doi:10.19173/irrodl.v15i1.1651
- Jordan, K. (2015). Massive open online course completion rates revisited: Assessment, length and attrition. *The International Review of Research in Open and Distributed Learning, 16*(3), 341-358. doi:10.19173/irrodl.v16i3.2112
- Joussemet, M., Landry, R., & Koestner, R. (2008). A self-determination theory perspective on parenting. *Canadian Psychology, 49*, 194-200. doi:10.1037/a0012754
- Kagitcibasi, C. (2005). Autonomy and relatedness in cultural context: Implications for self and family. *Journal of Cross-Cultural Psychology, 36*, 403-422. doi:10.1177/0022022105275959
- Karageorghis, C., & Terry, P. (2010). *Inside sport psychology*. Champaign, IL: Human Kinetics.
- Karapanos, E., Gouveia, R., Hassenzahl, M., & Forlizzi, J. (2016). Well-being in the making: Peoples' experiences with wearable activity trackers. *Psychology of Well-Being, 6*. doi:10.1186/s13612-016-0042-6
- Kassabian, D. W. (2014). The value of MOOCs to early adopter universities. *Educause Review Online*. Retrieved from

<http://er.educause.edu/articles/2014/6/the-value-of-moocs-to-early-adopter-universities>

- Kasser, T., & Ryan, R. M. (1996). Further examining the American dream: Differential correlates of intrinsic and extrinsic goals. *Personality and Social Psychology Bulletin*, 22, 280-287. doi:10.1177/0146167296223006
- Kaushik, A. (2007, 6 August). Standard metrics revisited: #3: Bounce rate [Web log post]. Retrieved from <http://www.kaushik.net/avinash/standard-metrics-revisited-3-bounce-rate/>
- Kelle, S., Henka, A., & Zimmermann, G. (2015). A persona-based extension for Massive Open Online Courses in accessible design. *Procedia Manufacturing*, 3, 3663-3668. doi:10.1016/j.promfg.2015.07.772
- Knee, C. R., Neighbors, C., & Vefor, N. A. (2001). Self-determination theory as a framework for understanding road rage. *Journal of Applied Social Psychology*, 31, 889-904. doi:10.1111/j.1559-1816.2001.tb02654.x
- Knee, C. R., & Zuckerman, M. (1996). Causality orientations and the disappearance of the self-serving bias. *Journal of Research in Personality*, 30, 76-87. doi:10.1006/jrpe.1996.0005
- Knowles, M. S. (1980). *The Modern Practice of Adult Education: From Pedagogy to Andragogy*. New York, NY: Cambridge.
- Knowles, M. S. (1984). *Andragogy in Action: Applying Modern Principles of Adult Learning*. San Francisco, CA: Jossey-Bass.

- Koestner, R., Bernieri, F., & Zuckerman, M. (1992). Self-regulation and consistency between attitudes, traits, and behaviors. *Personality and Social Psychology Bulletin*, 18, 52-59. doi:10.1177/0146167292181008
- Koestner, R., & Zuckerman, M. (1994). Causality orientations, failure, and achievement. *Journal of Personality*, 62, 321-346. doi:10.1111/j.1467-6494.1994.tb00300.x
- Kovanović, V., Joksimović, S., Gašević, D., Siemens, G., & Hatala, M. (2015). What public media reveals about MOOCs: A systematic analysis of news reports. *British Journal of Educational Technology*, 46, 510-527. doi:10.1111/bjet.12277
- Krippendorff, K. (2013). *Content analysis: An introduction to its methodology* (3<sup>rd</sup> ed.). Los Angeles, CA: SAGE Publications.
- Krishen, A. S., Berezan, O., Agarwal, S., & Kachroo, P. (2016). The generation of virtual needs: Recipes for satisfaction in social media networking. *Journal of Business Research* 69, 5248-5254. doi:10.1016/j.jbusres.2016.04.120
- Krishnan, S. S., & Sitaraman, R. K. (2013). Video stream quality impacts viewer behavior: Inferring causality using quasi-experimental designs. *IEEE/ACM Transactions on Networking*, 21, 2001-2014. doi:10.1109/TNET.2013.2281542
- Krug, S. (2006). *Don't make me think! A common sense approach to web usability* (2<sup>nd</sup> ed.). Berkeley: CA: New Riders Publishing.
- La Guardia, J. G., & Patrick, H. (2008). Self-determination theory as a fundamental theory of close relationships. *Canadian Psychology*, 49, 201-209. doi:10.1037/a0012760

- La Guardia, J. G., Ryan, R. M., Couchman, C. E., & Deci, E. L. (2000). Within-person variation in security of attachment: A self-determination theory perspective on attachment, need fulfillment, and well-being. *Journal of Personality and Social Psychology, 79*, 367-384. doi:10.1037/0022-3514.79.3.367
- Larson, E. (2013, May 30). 5 reasons to choose Vimeo instead of YouTube [Web log post]. Retrieved from <http://mashable.com/2013/05/30/vimeo-over-youtube/#2OQVrH7WtkqA>
- Law, E. L.-C., Roto, V., Hassenzahl, M., Vermeeren, A. P., & Kort, J. (2009). Understanding, scoping and defining user experience: A survey approach. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 719-728). doi:10.1145/1518701.1518813
- Leblanc, V., Bégin, C., Hudon, A.-M., Royer, M.-M., Corneau, L., Dodin, S., & Lemieux, S. (2016). Effects of a nutritional intervention program based on the self-determination theory and promoting the Mediterranean diet. *Health Psychology Open, 3*(1). doi:10.1177/2055102915622094
- Lebow, D. (1993). Constructivist values for instructional systems design: Five principles toward a new mindset. *Educational Technology Research and Development, 41*(3), 4-16. doi:10.1007/bf02297354
- Lepper, M. R., & Greene, D. (1975). Turning play into work: Effects of adult surveillance and extrinsic rewards on children's intrinsic motivation. *Journal of Personality and Social Psychology, 31*, 479-486. doi:10.1037/h0076484



- Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology, 28*, 129-137.  
doi:10.1037/h0035519
- Lin, J. C.-C. (2007). Online stickiness: its antecedents and effect on purchasing intention. *Behaviour & Information Technology, 26*, 507-516.  
doi:10.1080/01449290600740843
- Litalien, D., & Guay, F. (2015). Dropout intentions in PhD studies: A comprehensive model based on interpersonal relationships and motivational resources. *Contemporary Educational Psychology, 41*, 218-231.  
doi:10.1016/j.cedpsych.2015.03.004
- Liu, J. D., Chung, P. K., & Duan, Y. (2013). Validity and reliability of the Chinese translation of Basic Psychological Needs in Exercise Scale. *European Journal of Psychological Assessment, 29*, 51-57. doi:10.1027/1015-5759/a000120
- Livingstone, D. (1999). Exploring the icebergs of adult learning: findings of the first Canadian survey of informal learning practices. *NALL Working Paper No.10, 1999*. Retrieved from  
<https://tspace.library.utoronto.ca/retrieve/4451/10exploring.pdf>
- Lombard, M., & Ditton, T. (1997). At the heart of it all: The concept of presence. *Journal of Computer-Mediated Communication, 3*(2). doi:10.1111/j.1083-6101.1997.tb00072.x
- Lombard, M., Snyder-Duch, J., & Bracken, C. C. (2002). Content analysis in mass communication: Assessment and reporting of intercoder reliability. *Human*

*Communication Research*, 28, 587-604. doi:10.1111/j.1468-2958.2002.tb00826.x

Lombardi, M. M. (2007). *Authentic learning for the 21st century: An overview*.

Retrieved from <https://library.educause.edu/resources/2007/1/authentic-learning-for-the-21st-century-an-overview>

Lundun, I. (2016, March 11). Amazon eyes up education, plans a free platform for learning materials. Retrieved from <https://techcrunch.com/2016/03/11/amazon-eyes-up-education-plans-a-free-platform-for-learning-materials/>

Magain, M. (February 12, 2013). What does a user-centred design process look like? [Web log post]. Retrieved from <http://uxmastery.com/what-does-a-user-centred-design-process-look-like/>

Mageau, G. A., & Vallerand, R. J. (2003). The coach–athlete relationship: A motivational model. *Journal of Sports Sciences*, 21, 883-904.  
doi:10.1080/0264041031000140374

Margaryan, A., Bianco, M., & Littlejohn, A. (2015). Instructional quality of Massive Open Online Courses (MOOCs). *Computers & Education*, 80, 77-83.  
doi:10.1016/j.compedu.2014.08.005

Markus, H. R., & Kitayama, S. (2003). Models of agency: Sociocultural diversity in the construction of action. In V. M.-B. J. J. Berman (Ed.), *Cross-cultural differences in perspectives on the self* (pp. 18-74). Lincoln, NE: University of Nebraska Press.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and

dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal*, 11, 320-341.

doi:10.1207/s15328007sem1103\_2

Marsh, H. W., Morin, A. J., Parker, P. D., & Kaur, G. (2014). Exploratory structural equation modeling: an integration of the best features of exploratory and confirmatory factor analysis. *Annual Review of Clinical Psychology*, 10, 85-110. doi:10.1146/annurev-clinpsy-032813-153700

Martens, R., Bastiaens, T., & Kirschner, P. A. (2007). New learning design in distance education: The impact on student perception and motivation. *Distance Education*, 28, 81-93. doi:10.1080/01587910701305327

Martens, R., Vealey, R. S., & Burton, D. (1990). *Competitive anxiety in sport*. Champaign, IL: Human Kinetics.

Matosic, D., Ntoumanis, N., Boardley, I. D., Sedikides, C., Stewart, B. D., & Chatzisarantis, N. (2015). Narcissism and coach interpersonal style: A self-determination theory perspective. *Scandinavian Journal of Medicine & Science in Sports*. Advance online publication. doi:10.1111/sms.12635

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, 60, 48-58. doi:10.1080/02701367.1989.10607413

Merriam, S. B. (2001). Andragogy and self-directed learning: pillars of adult learning theory. *New Directions for Adult and Continuing Education*, 2001(89), 3-14. doi:10.1002/ace.3

- Metadata Basics. (2016). Retrieved from <http://dublincore.org/metadata-basics/>
- Mezirow, J. (1990). How critical reflection triggers transformative learning. In J. Mezirow (Ed.), *Fostering critical reflection in adulthood* (pp.1-20). San Francisco, CA: Jossey-Bass Publishers.
- Michalos, A. C. (2008). Education, happiness and well-being. *Social Indicators Research*, 87, 347-366. doi:10.1007/s11205-007-9144-0
- Moe, R. (2015). OER as online edutainment resources: A critical look at open content, branded content, and how both affect the OER movement. *Learning, Media and Technology*, 40, 350-364. doi:10.1080/17439884.2015.1029942
- Moller, A. C., Deci, E. L., & Ryan, R. M. (2006). Choice and ego-depletion: The moderating role of autonomy. *Personality and Social Psychology Bulletin*, 32, 1024-1036. doi:10.1177/0146167206288008
- Moreno-Murcia, J. A., Martínez-Galindo, C., Moreno-Pérez, V., Marcos, P. J., & Borges, F. (2012). Confirmation of the Basic Psychological Needs in Exercise Scale (BPNES) with a sample of people who do healthy exercise. *Journal of Sports Science & Medicine*, 11, 141-146. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3737849/pdf/>
- Moutão, J. M. R. P., Serra, L. F. C., Alves, J. A. M., Leitão, J. C., & Vlachopoulos, S. P. (2012). Validation of the Basic Psychological Needs in Exercise Scale in a Portuguese sample. *The Spanish Journal of Psychology*, 15, 399-409. doi:10.5209/rev\_SJOP.2012.v15.n1.37346

- Murgatroyd, S., & Tully, J. (2015). *The impact of the Commonwealth of Learning, 2006–2015: Value through learning for development*. Retrieved from <http://oasis.col.org/handle/11599/1511>
- Murphy, L. (2008). Supporting learner autonomy: Developing practice through the production of courses for distance learners of French, German and Spanish. *Language Teaching Research*, 12, 83-102. doi:10.1177/1362168807084495
- Muthén, L. K., & Muthén, B.O. (2015). *Mplus user's guide* (7<sup>th</sup> ed.). Los Angeles, CA: Muthén & Muthén.
- Myers, N. D., Jin, Y., Ahn, S., Celimli, S., & Zopluoglu, C. (2015). Rotation to a partially specified target matrix in exploratory factor analysis in practice. *Behavior Research Methods*, 47, 494-505. doi:10.3758/s13428-014-0486-7
- Neuendorf, K. A. (2002). *The content analysis guidebook*. Thousand Oaks, CA: Sage Publications.
- Nielsen, J. (June 21, 2010). Website Response Times. Retrieved from <https://www.nngroup.com/articles/website-response-times/>
- Nielsen, J. (January 4, 2012a). Usability 101: Introduction to usability. Retrieved from <https://www.nngroup.com/articles/usability-101-introduction-to-usability/>
- Nielsen, J. (June 4, 2012b). How many test users in a usability study? Retrieved from <https://www.nngroup.com/articles/how-many-test-users/>
- Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education*, 7, 133-144. doi:10.1177/1477878509104318

- Niven, A. G., & Markland, D. (2016). Using self-determination theory to understand motivation for walking: Instrument development and model testing using Bayesian structural equation modelling. *Psychology of Sport and Exercise, 23*, 90-100. doi:10.1016/j.psychsport.2015.11.004
- Noels, K. A., Pelletier, L. G., Clément, R., & Vallerand, R. J. (2003). Why are you learning a second language? Motivational orientations and self-determination theory. *Language Learning, 53*, 33-64. doi:10.1111/1467-9922.53223
- Norman, D. A., & Draper, S. W. (1986). *User centered system design: New perspectives on human-computer interaction*. Hillsdale, NJ: L. Erlbaum Associates Inc.
- Norman, G. R. (1999). The adult learner: a mythical species. *Academic Medicine, 74*, 886-889. doi:10.1097/00001888-199908000-00011
- O'Connor, K. (2011, March 25). Personas: The foundation of a great user experience [Web log post]. Retrieved from <https://uxmag.com/articles/personas-the-foundation-of-a-great-user-experience>
- Office of Educational Technology (2016). #GoOpen District launch packet. Retrieved from <http://tech.ed.gov/files/2016/06/GoOpen-District-Launch-Packet.pdf>
- Olesen, M. H. (2011). General causality orientations are distinct from but related to dispositional traits. *Personality and Individual Differences, 51*, 460-465. doi:10.1016/j.paid.2011.04.015
- Oliver, R., & Herrington, J. (2003). Exploring technology-mediated learning from a P

pedagogical perspective. *Interactive Learning Environments*, 11, 111-126.

doi:10.1076/ilee.11.2.111.14136

Open Definition (n.d.). Open Definition 2.1. Retrieved from

<http://opendefinition.org/od/2.1/en/>

Papaioannou, P., Theodosiou, A., Pashali, M., & Digelidis, N. (2012). Advancing task involvement, intrinsic motivation and metacognitive regulation in physical education classes: The self-check style of teaching makes a difference.

*Advances in Physical Education*, 2, 110-118. doi:10.4236/ape.2012.23020

Pappano, L. (2012, November 2). The Year of the MOOC. Retrieved from

<http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html>

Patmore, A. (July 9, 2014). Why sports psychologists couldn't save Brazil's World Cup hopes. Retrieved from

<https://www.theguardian.com/football/2014/jul/09/why-sports-psychologists-couldnt-save-brazil-world-cup>

Personas. (n.d.). Retrieved from [https://www.usability.gov/how-to-and-](https://www.usability.gov/how-to-and-tools/methods/personas.html)

[tools/methods/personas.html](https://www.usability.gov/how-to-and-tools/methods/personas.html)

Perzyńska, K. (2015, Aug 13). What is bounce rate and how to reduce it [Web log

post]. Retrieved from <http://positionly.com/blog/content-marketing/bounce-rate>

Peter, S., & Deimann, M. (2013). On the role of openness in education: A historical reconstruction. *Open Praxis*, 5, 7-14. doi:10.5944/openpraxis.5.1.23

- Peters, M. A. (2010). Three forms of the knowledge economy: Learning, creativity and openness. *British Journal of Educational Studies*, 58, 67-88.  
doi:10.1080/00071000903516452
- Pew, S. (2007). Andragogy and pedagogy as foundational theory for student motivation in Higher Education. *InSight: A Journal of Scholarly Teaching*, 2, 14-25. Retrieved from [http://insightjournal.net/?page\\_id=146](http://insightjournal.net/?page_id=146)
- Pierce, P. (2015, September 28). 10 guidelines for navigation usability [Web log post]. Retrieved from <http://usabilitygeek.com/10-guidelines-for-navigation-usability/>
- Plant, R. W., & Ryan, R. M. (1985). Intrinsic motivation and the effects of self-consciousness, self-awareness, and ego-involvement: An investigation of internally controlling styles. *Journal of Personality*, 53, 435-449.  
doi:10.1111/j.1467-6494.1985.tb00375.x
- Przybylski, A. K., Rigby, C. S., & Ryan, R. M. (2010). A motivational model of video game engagement. *Review of General Psychology*, 14, 154-166.  
doi:10.1037/a0019440
- QSR International NVivo 11 [Computer software] (2015). Melbourne, Australia: QSR International Pty Ltd.
- Raaijmakers, L. G. M., Martens, M. K., Bagchus, C., de Weerd, I., de Vries, N. K., & Kremers, S. P. J. (2015). Correlates of perceived self-care activities and diabetes control among Dutch type 1 and type 2 diabetics. *Journal of Behavioral Medicine*, 38, 450-459. doi:10.1007/s10865-014-9609-y



Rachal, J. R. (2002). Andragogy's detectives: A critique of the present and a proposal for the future. *Adult Education Quarterly*, 52, 210-227.

doi:10.1177/0741713602052003004

Reeve, J. (2012). A self-determination theory perspective on student engagement. In L. S. Christenson, L. A. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 149-172). Boston, MA: Springer US.

Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion*, 28, 147-169. doi:10.1023/B:MOEM.0000032312.95499.6f

Reeve, J., & Lee, W. (2014). Students' classroom engagement produces longitudinal changes in classroom motivation. *Journal of Educational Psychology*, 106, 527-540. doi:10.1037/a0034934

Reeve, J., Ryan, R., Deci, E. L., & Jang, H. (2007). Understanding and promoting autonomous self-regulation: A self-determination theory perspective. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: theory, research, and application* (pp. 223-244). New York, NY: Lawrence Erlbaum Associates.

Reich, J. (2014). MOOC completion and retention in the context of student intent. *Educause Review Online*. Retrieved from <http://www.educause.edu/ero/article/mooc-completion-and-retention-context-student-intent>

Reinecke, L., & Trepte, S. (2014). Authenticity and well-being on social network sites: A two-wave longitudinal study on the effects of online authenticity and

- the positivity bias in SNS communication. *Computers in Human Behavior*, *30*, 95-102. doi:10.1016/j.chb.2013.07.030
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*, 419-435. doi:10.1177/0146167200266002
- Rigby, C. S., & Ryan, M. R. (2016). Time well spent? Motivation for entertainment media and its eudaimonic aspects through the lens of self-determination theory. In L. Reinecke & M. B. Oliver (Eds.), *The Routledge handbook of media use and well-being: International perspectives on theory and research on positive media effects*. New York, NY: Routledge.
- Roca, J. C., & Gagné, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behavior*, *24*, 1585-1604. doi:10.1016/j.chb.2007.06.001
- Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting Psychology*, *21*, 95-103. doi:10.1037/h0045357
- Rose, E. A., Markland, D., & Parfitt, G. (2001). The development and initial validation of the Exercise Causality Orientations Scale. *Journal of Sports Sciences*, *19*, 445-462. doi:10.1080/026404101300149393
- Roth, G., Ron, T., & Benita, M. (2009). Mothers' parenting practices and adolescents' learning from their mistakes in class: The mediating role of adolescent's self-disclosure. *Learning and Instruction*, *19*, 506-512. doi:10.1016/j.learninstruc.2008.10.001

- Rubin, J., & Chisnell, D. (2008). *Handbook of usability testing: How to plan, design, and conduct effective tests*. Indianapolis, IN: Wiley.
- Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43*, 450-461. doi:10.1037/0022-3514.43.3.450
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, *57*, 749-761. doi:10.1037/0022-3514.57.5.749
- Ryan, R. M., Curren, R. R., & Deci, E. L. (2013). What humans need: Flourishing in Aristotelian philosophy and self-determination theory. In A. S. Waterman (Ed.), *The best within us: Positive psychology perspectives on eudaimonia* (pp. 57-75). Washington, DC: American Psychological Association.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68-78. doi:10.1037/0003-066x.55.1.68
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141-166. doi:10.1146/annurev.psych.52.1.141
- Ryan, R. M., & Deci, E. L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *Journal of Personality*, *74*, 1557-1586. doi:10.1111/j.1467-6494.2006.00420.x

- Ryan, R. M., & Deci, E. L. (2009). Promoting self-determined school engagement: Motivation, learning, and well-being. In K. R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 171-195). New York, NY: Routledge.
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York, NY: Guilford Press.
- Ryan, R. M., Huta, V., & Deci, E. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, 9, 139-170.  
doi:10.1007/s10902-006-9023-4
- Ryan, R. M., & Martela, F. (2016). Eudaimonia as a way of living: Connecting Aristotle with self-determination theory. In J. Vittersø (Ed.), *Handbook of eudaimonic well-being* (pp. 109-122). Cham, Switzerland: Springer International Publishing.
- Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on self-determination theory. *European Health Psychologist*, 10, 2-5. Retrieved from <http://www.ehps.net/ehp/index.php/contents/article/download/ehp.v10.i1.p2/32>
- Ryan, R. M., Rigby, C. S., & Przybylski, A. (2006). The motivational pull of video games: A self-determination theory approach. *Motivation and Emotion*, 30, 344-360. doi:10.1007/s11031-006-9051-8
- Ryff, C. D. (2014). Psychological well-being revisited: Advances in the science and practice of eudaimonia. *Psychotherapy and Psychosomatics*, 83, 10-28.  
doi:10.1159/000353263

- Salmon, G. (2013). *E-tivities: The key to active online learning*. New York, NY: Routledge.
- Sander, T. (2011). Positive computing. In R. Biswas-Diener (Ed.), *Positive psychology as social change* (pp. 309-326). Dordrecht, Netherlands: Springer Netherlands.
- Sarrazin, P. G., Tessier, D. P., Pelletier, L. G., Trouilloud, D. O., & Chanal, J. P. (2006). The effects of teachers' expectations about students' motivation on teachers' autonomy-supportive and controlling behaviors. *International Journal of Sport and Exercise Psychology*, 4, 283-301.  
doi:10.1080/1612197X.2006.9671799
- Schinke, R. J., Papaioannou, A. G., & Schack, T. (2016). Sport psychology in emerging countries: An introduction. *International Journal of Sport and Exercise Psychology*, 14, 103-109. doi:10.1080/1612197X.2016.1155828
- Schwartz, B. (2000). Self-determination: The tyranny of freedom. *American Psychologist*, 55, 79-88. doi:10.1037/0003-066X.55.1.79
- Seidman, G. (2013). Self-presentation and belonging on Facebook: How personality influences social media use and motivations. *Personality and Individual Differences*, 54, 402-407. doi:10.1016/j.paid.2012.10.009
- Seligman, M. E. P. (1972). Learned helplessness. *Annual Review of Medicine*, 23, 407-412. doi:10.1146/annurev.me.23.020172.002203
- Seligman, M. E. P. (2002). Pleasure, meaning & eudaimonia. Retrieved from <https://www.authentic happiness.sas.upenn.edu/newsletters/authentic happiness/pleasure>

- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, *55*, 5-14. doi:10.1037/0003-066X.55.1.5
- Sharples, M., Kloos, C. D., Dimitriadis, Y., Garlatti, S., & Specht, M. (2015). Mobile and accessible learning for MOOCs. *Journal of Interactive Media in Education*, *2015*(1). doi:10.5334/jime.ai
- Sharrock, G. (2015). Making sense of the MOOCs debate. *Journal of Higher Education Policy and Management*, *37*, 597-609. doi:10.1080/1360080X.2015.1079399
- Sheldon, K. M. (1995). Creativity and self-determination in personality. *Creativity Research Journal*, *8*, 25-36. doi:10.1207/s15326934crj0801\_3
- Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology*, *76*, 482-497. doi:10.1037/0022-3514.76.3.482
- Sheldon, K. M., & Filak, V. (2008). Manipulating autonomy, competence, and relatedness support in a game-learning context: New evidence that all three needs matter. *British Journal of Social Psychology*, *47*, 267-283. doi:10.1348/014466607X238797
- Siemens, G. (2015). Forward 1: The role of MOOCs in the future of education. In C. J. Bonk, M. M. Lee, T. C. Reeves, & T. H. Reynolds (Eds.), *MOOCs and open education around the world* (pp. xiii-xvii). New York, NY: Routledge.
- Simpson, O. (2008). Motivating learners in open and distance learning: do we need a new theory of learner support? *Open Learning: The Journal of Open, Distance and e-Learning*, *23*, 159-170. doi:10.1080/02680510802419979

- Sinclair, S., & Rockwell, G. (2016). Voyant Tools. Retrieved from <http://voyant-tools.org/docs/#!/guide/about>
- Singer, M., & Porter, D. (2015). Exploring the process of using OER to build transnationally accredited courses within the OERu partner network—an activity theory perspective. In *Proceedings of Open Education Global Conference 2015: Innovation and Entrepreneurship*. Retrieved from <http://conference.oeconsortium.org/2015/presentations/>
- Skinner, B. F. (1948). 'Superstition' in the pigeon. *Journal of Experimental Psychology*, 38, 168-172. doi:10.1037/h0055873
- Skinner, B. F. (1953). *Science and human behavior*. New York, NY: Macmillan.
- Soenens, B., Berzonsky, M. D., Vansteenkiste, M., Beyers, W., & Goossens, L. (2005). Identity styles and causality orientations: in search of the motivational underpinnings of the identity exploration process. *European Journal of Personality*, 19, 427-442. doi:10.1002/per.551
- Soenens, B., & Beyers, W. (2012). The cross-cultural significance of control and autonomy in parent–adolescent relationships. *Journal of Adolescence*, 35, 243-248. doi:10.1016/j.adolescence.2012.02.007
- Solberg, P. A., Halvari, H., & Ommundsen, Y. (2013). Linking exercise and causality orientations to change in well-being among older adults: does change in motivational variables play a role? *Journal of Applied Social Psychology*, 43, 1259-1272. doi:10.1111/jasp.12088
- Sørenbø, Ø., Halvari, H., Gulli, V. F., & Kristiansen, R. (2009). The role of self-determination theory in explaining teachers' motivation to continue to use e-

learning technology. *Computers & Education*, 53, 1177-1187.

doi:10.1016/j.compedu.2009.06.001

Spence, G. B., & Deci, E. L. (2016). Self-determination theory within coaching contexts: Supporting motives and goals that promote optimal functioning and well-being. In S. David, D. Clutterbuck, & D. Megginson (Eds.), *Beyond goals: effective strategies for coaching and mentoring*. Abingdon, United Kingdom: Routledge.

Spencer, D. (2014, October 16). How to conduct a content audit [Web log post].

Retrieved from <http://uxmastery.com/how-to-conduct-a-content-audit/>

Sport Psychology. (n.d.). Retrieved from

<http://www.apa.org/ed/graduate/specialize/sports.aspx>

Stevens, E. (2014, August 11). Measuring success is not easy [Web log post].

Retrieved from <https://www.insidehighered.com/blogs/higher-ed-beta/measuring-success-not-easy>

Stich, A. E., & Reeves, T. D. (2017). Massive open online courses and underserved students in the United States. *The Internet and Higher Education*, 32, 58-71.

doi:10.1016/j.iheduc.2016.09.001

Su, Y.-L., & Reeve, J. (2011). A meta-analysis of the effectiveness of intervention programs designed to support autonomy. *Educational Psychology Review*, 23,

159-188. doi:10.1007/s10648-010-9142-7

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5<sup>th</sup> ed.).

Boston, MA: Pearson.



- Tang, S.-H., & Hall, V. C. (1995). The overjustification effect: A meta-analysis. *Applied Cognitive Psychology, 9*, 365-404. doi:10.1002/acp.2350090502
- Tas, C., Brown, E. C., Esen-Danaci, A., Lysaker, P. H., & Brüne, M. Intrinsic motivation and metacognition as predictors of learning potential in patients with remitted schizophrenia. *Journal of Psychiatric Research, 46*, 1086-1092. doi:10.1016/j.jpsychires.2012.04.027
- Taylor, G., Jungert, T., Mageau, G. A., Schattke, K., Dedic, H., Rosenfield, S., & Koestner, R. (2014). A self-determination theory approach to predicting school achievement over time: The unique role of intrinsic motivation. *Contemporary Educational Psychology, 39*, 342-358. doi:10.1016/j.cedpsych.2014.08.002
- Taylor, J. C., & Mackintosh, W. (2011). Creating an open educational resources university and the pedagogy of discovery. *Open Praxis Special Edition: A Tribute to Nyameko Barney Pityana, 2011*, 24-29. doi.10.5944/openpraxis.0.0.59
- Terry, P. (1989). *The winning mind: Fine tune your mind for superior sports performance*. London, United Kingdom: Thorsons Publishers.
- Terry, P. C. (2011). Applied sport psychology: Beware the sun, Icarus. In Martin, P. R. et al. (Eds.). *IAAP handbook of applied psychology* (pp. 386-410). Oxford, United Kingdom: Blackwell.
- Terry, P. C., Lane, A. M., Lane, H. J., & Keohane, L. (1999). Development and validation of a mood measure for adolescents. *Journal of Sports Sciences, 17*, 861-872. doi:10.1080/026404199365425

- Terry, P. C., Zhang, L., Kim, Y., Morris, T., & Hanrahan, S. (Eds.). (2014). *Secrets of Asian sport psychology*. Toowoomba, Australia: University of Southern Queensland. Retrieved from <http://peterterry.wixsite.com/books>
- Travis, D. (2015, July 6). Are personas past their prime? [Web log post]. Retrieved from <http://www.userfocus.co.uk/articles/are-personas-past-their-prime.html>
- Tschofen, C., & Mackness, J. (2012). Connectivism and dimensions of individual experience. *The International Review of Research in Open and Distance Learning*, 13(1), 124-143. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/1143/2086>
- Turban, D. B., & Yan, W. (2016). Relationship of eudaimonia and hedonia with work outcomes. *Journal of Managerial Psychology*, 31, 1006-1020.  
doi:10.1108/JMP-07-2015-0271
- Usage statistics and market share of WordPress for websites. (2015). Retrieved from <https://w3techs.com/technologies/details/cm-wordpress/all/all>
- Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology*, 72, 1161-1176.  
doi:10.1037/0022-3514.72.5.1161
- Vallerand, R. J., Pelletier, L. G., & Koestner, R. (2008). Reflections on self-determination theory. *Canadian Psychology*, 49, 257-262.  
doi:10.1037/a0012804

Van den Broeck, A., Ferris, D. L., Chang, C.-H., & Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *Journal of Management* 42, 1195-1229. doi:10.1177/0149206316632058

Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-Related Basic Need Satisfaction Scale. *Journal of Occupational and Organizational Psychology*, 83(4), 981-1002. doi:10.1348/096317909X481382

Van den Haak, M., De Jong, M., & Jan Schellens, P. (2003). Retrospective vs. concurrent think-aloud protocols: Testing the usability of an online library catalogue. *Behaviour & Information Technology*, 22, 339-351. doi:10.1080/0044929031000

Vansteenkiste, M. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology*, 87, 246-260. doi:10.1037/0022-3514.87.2.246

Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational psychologist*, 41, 19-31. doi:10.1207/s15326985ep4101\_4

Vansteenkiste, M., & Mouratidis, A. (2016). Emerging trends and future directions for the field of motivation psychology: A special issue in honor of Prof. Dr. Willy Lens. *Psychologica Belgica*, 56, 118-142. doi:doi.org/10.5334/pb.354

- Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions. In T. C. Urdan & S. A. Karabenick (Series Eds.), *Advances in Motivation and Achievement: Vol. 16A. The decade ahead: Theoretical perspectives on motivation and achievement* (pp. 105-165). doi:10.1108/s0749-7423(2010)000016a007
- Vansteenkiste, M., & Ryan, R. M. (2013). On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *Journal of Psychotherapy Integration, 23*, 263-280. doi:10.1037/a0032359
- Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K. M., & Deci, E. L. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology, 87*, 246-260. doi:10.1037/0022-3514.87.2.246
- Vansteenkiste, M., Timmermans, T., Lens, W., Soenens, B., & Van den Broeck, A. (2008). Does extrinsic goal framing enhance extrinsic goal-oriented individuals' learning and performance? An experimental test of the match perspective versus self-determination theory. *Journal of Educational Psychology, 100*, 387-397. doi:10.1037/0022-0663.100.2.387
- Vlachopoulos, S. P., Ascí, F. H., Cid, L., Ersoz, G., González-Cutre, D., Moreno-Murcia, J. A., & Moutão, J. (2013). Cross-cultural invariance of the basic psychological needs in exercise scale and need satisfaction latent mean differences among Greek, Spanish, Portuguese and Turkish samples.

*Psychology of Sport and Exercise*, 14, 622-631.

doi:10.1016/j.psychsport.2013.03.002

Vlachopoulos, S. P., Karageorghis, C. I., & Terry, P. C. (2000). Motivation profiles in sport: A self-determination theory perspective. *Research Quarterly for Exercise and Sport*, 71, 387-397. doi:10.1080/02701367.2000.10608921

Vlachopoulos, S. P., & Michailidou, S. (2006). Development and initial validation of a measure of autonomy, competence, and relatedness in exercise: The Basic Psychological Needs in Exercise Scale. *Measurement in Physical Education and Exercise Science*, 10, 179-201. doi:10.1207/s15327841mpee1003\_4

Vlachopoulos, S. P., Ntoumanis, N., & Smith, A. L. (2010). The basic psychological needs in exercise scale: Translation and evidence for cross-cultural validity. *International Journal of Sport and Exercise Psychology*, 8, 394-412. doi:10.1080/1612197X.2010.9671960

Vroom, V. H. (1964). *Work and motivation*. New York, NY: Wiley.

Waisberg, D. (2014, 11 September). More context with Google Analytics benchmarking [Web log post]. Retrieved from <http://online-behavior.com/analytics/benchmarking>

Walberg, H. J., & Thomas, S. C. (1972). Open education: An operational definition and validation in Great Britain and United States. *American Educational Research Journal*, 9, 197-208. doi:10.3102/00028312009002197

Wang, J. C. K., Ng, B. L., Liu, W. C., & Ryan, R. M. (2016). Can being autonomy-supportive in teaching improve students' self-regulation and performance? In J. Wang, C. W. Liu, & R. M. Ryan (Eds.), *Building autonomous learners:*

*Research and practical perspectives using self-determination theory* (pp. 227-243). Singapore: Springer.

Waterman, A. S. (2007). On the importance of distinguishing hedonia and eudaimonia when contemplating the hedonic treadmill. *American Psychologist*, *62*, 612-613. doi:10.1037/0003-066X62.6.612

Weinberg, R. S., & Gould, D. (2014). *Foundations of sport and exercise psychology* (6<sup>th</sup> ed.). Champaign, IL: Human Kinetics.

Weinstein, N., & Hodgins, H. S. (2009). The moderating role of autonomy and control on the benefits of written emotion expression. *Personality and Social Psychology Bulletin*, *35*, 351-364. doi:10.1177/0146167208328165

Weinstein, N., Przybylski, A. K., & Ryan, R. M. (2009). Can nature make us more caring? Effects of immersion in nature on intrinsic aspirations and generosity. *Personality and Social Psychology Bulletin*, *35*, 1315-1329. doi:10.1177/0146167209341649

Werquin, P. (2010). *Recognising Non-Formal and Informal Learning*. Paris, France: OECD Publishing.

What is OER? (2016). Retrieved from [https://wiki.creativecommons.org/wiki/What\\_is\\_OER%3F](https://wiki.creativecommons.org/wiki/What_is_OER%3F)

Wheeler, S., Yeomans, P., & Wheeler, D. (2008). The good, the bad and the wiki: Evaluating student-generated content for collaborative learning. *British Journal of Educational Technology*, *39*, 987-995. doi:10.1111/j.1467-8535.2007.00799.x

White, R. W. (1959). Motivation reconsidered: the concept of competence.

*Psychological Review*, 66, 297-333. doi:10.1037/h0040934

Wiley, D. (2007). *On the sustainability of open educational resource initiatives in higher education*. Retrieved from <https://www1.oecd.org/edu/ceeri/38645447.pdf>

Wiley, D. (2016, July 7). Iterating towards openness. Retrieved from <http://opencontent.org/blog/>

Wiley, D., Bliss, T. J., & McEwen, M. (2014). Open Educational Resources: A review of the literature. In M. J. Spector, D. M. Merrill, J. Elen, & J. M. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 781-789). New York, NY: Springer New York.

Writing for the web. (n.d.). Retrieved from <https://www.usability.gov/how-to-and-tools/methods/writing-for-the-web.html>

Xiong, Y., Li, H., Kornhaber, M. L., Suen, H. K., Pursel, B., & Goins, D. D. (2015). Examining the relations among student motivation, engagement, and retention in a MOOC: A structural equation modeling approach. *Global Education Review*, 2(3), 23-33. Retrieved from <http://ger.mercy.edu/index.php/ger/article/download/124/138>

Yuan, L., & Powell, S. (2013). *MOOCs and open education: Implications for higher education. A white paper*. Retrieved from <http://publications.cetis.ac.uk/2013/667>

Zeldman, A., Ryan, R. M., & Fiscella, K. (2004). Motivation, autonomy support, and entity beliefs: their role in methadone maintenance treatment. *Journal of Social & Clinical Psychology*, 23, 675-696. doi:10.1521/jscp.23.5.675.50744

Zhenghao, C., Alcorn, B., Christensen, G., Eriksson, N., Koller, D., & Emanuel, E. J.

(2015). Who's benefiting from MOOCs, and why. *Harvard Business Review*.

Retrieved from <https://hbr.org/2015/09/whos-benefiting-from-moocs-and-why>

Zhou, M. (2016). Chinese university students' acceptance of MOOCs: A self-

determination perspective. *Computers & Education*, 92–93, 194-203. doi:

10.1016/j.compedu.2015.10.012



## Appendix A

**User Personas as Design Reference Points for Study 2**

The development of fictional but realistic user personas is a technique commonly used by web professionals to represent archetypes of users of a website to aid the design process. Their main purpose is to illustrate the demographics, motivations, and interests of website users. Personas can be “brought out” at different points to help guide the design of the user experience and ask questions like: “What would Barry do here? What would he think? Is this going to work?”

Four personas were created each with different backgrounds and interests.

- **Persona 1:** Cheng Lo. A Malaysian badminton coach (52 years old) seeking sport psychology techniques to help with training (Figure A1).
- **Persona 2:** Grant Kilby. A Canadian basketball scholarship student (19 years old) seeking to compliment his existing studies. He is a high user of technology (Figure A2).
- **Persona 3:** Sáríka Balik. A Hungarian sport psychology research student (24 years old) updating her knowledge of the field. She is aware of the course convenor through her research and expects a quality learning experience (Figure A3).
- **Persona 4:** Ken Masters. An Australian retiree (74 years old) with an interest in sport—particularly cricket. He is less confident with technology and has not been involved in formal education since school (Figure A4).

# Cheng (Henry) Lo



**Location:** Kuala Lumpur, Malaysia

**Job title:** Badminton Coach

**Major responsibilities:** Head Coach to number 8 nationally ranked Malaysian badminton player

**Deputy Program Manager:** Malaysia National Coaching in Schools Programme

**Demographics:**

- 52 years old
- Married
- Father of four children
- Grandfather of one child

**Qualifications:** Bachelor of Education (Physical Education) Universiti Kebangsaan Malaysia

**Languages:** Cantonese, Bahasa Malay, English (highly competent)

**Profile:** Henry Lo is a former sports teacher and national amateur badminton finalist. His greatest sporting achievement is representing Malaysia in the 1986 Asian Games. Injury curtailed his career and he moved into Badminton coaching. For many years he was an amateur coach working with his local badminton club, but in 1998 became a qualified registered professional coach through the Badminton Association of Malaysia and has made significant career progression to coach at a national level. He is currently Head Coach to Fu Mu Chong, an up and coming elite player. He also passionate about the badminton in schools and is heavily involved in a national government programme.

Henry is focused, goal-oriented with an analytical mind. One of his concerns is maintaining quality across all facets of his coaching team (two other coaches).

**Spends his work time:**

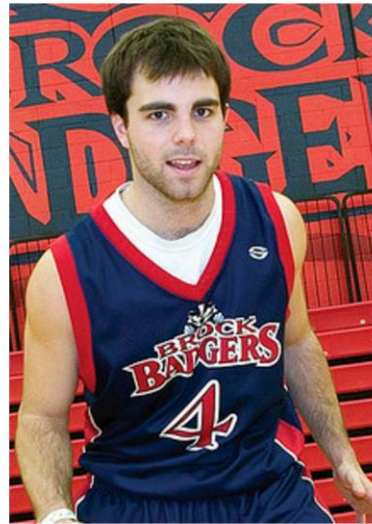
- Managing coaching program
- Requesting and reviewing coaching reports
- One to one coaching

**Reasons for doing course:** He has had an informal interest in psychological aspects of sport for many years. However he now feels that he must have some form of qualification in this area. He also looking for the edge that will get his player into the national squad for the next Commonwealth Games.

He is comfortable using a computer and refers to himself as an intermediate Internet user. He is connected via a T1 connection and ADSL at home. He uses email extensively and uses the web about 1.5 hours during his work day. He is not a user of social media, but his youngest daughter uses Facebook and Weibo (but not Twitter).

Figure A1. Cheng Lo.

# Grant Kilby



**Location:** St. Catharines, Ontario, Canada

**Job title:** University student at Brock University, Canada

**Major responsibilities:** Basketball scholarship at Brock. Also studying a Bachelor of Kinesiology

**Demographics:**

- 19 years old
- Single
- One brother

**Qualifications:** Ontario Secondary School Certificate

**Languages:** English

**Profile:** Grant has a basketball scholarship at Brock University. At 6'2", he is a relatively short but versatile player who plays in the small forward (SF) position. He applied for a basketball scholarship at a number of US colleges but was not accepted due to a highly competitive field. He has played to a high standard at youth level and has represented his province at under 16 and under 18 level. In his dreams, he would love to be drafted into the NBA after university, but is realistic and is hoping to represent his province as an amateur whilst pursuing a career in the fitness industry. His hero is Oklahoma City Thunder's Kevin Durant.

Grant is competitive, highly motivated and smart. One of his concerns is balancing his studies with his fitness and training regime

**Spends his time:**

- Studying
- Training and playing basketball
- Social media, playing video games, going out with friends (although is disciplined in terms of diet and lifestyle).

**Reasons for doing course:** Grant is studying a Bachelor of Kinesiology (BKin) degree. Kinesiology is the study of the mechanics of body movements. The discipline emphasises the biophysical, behavioural and socio-cultural aspects of kinesiology including exercise prescription and rehabilitation, fitness programming and clinical assessment. Grant is aware of Sports Psychology as a discipline and believe a qualification will compliment his existing studies. He also thinks that he will gain some useful insights to assist him in preparation for basketball competition.

Grant could be described as belonging to the tech generation. He owns an iPhone, iPad, Playstation 4 and MacBook Pro. He has high speed and constant access to the internet and is always connected via email, social media, messaging and push notifications.

Figure A2. Grant Kilby.

# Sáríka Balik



**Location:** Budapest, Hungary

**Job title:** Postgraduate student at Semelweis University, Hungary

**Major responsibilities:** Enrolled on doctorate programme within the Doctoral School of Sport Sciences

**Demographics:**

- 24 years old
- In a relationship
- Two brothers and a sister. Parents are doctors

**Qualifications:** Masters of Sports Science

**Languages:** Hungarian, Russian, English

**Profile:** Sáríka is beginning her doctoral studies within the Doctoral School of Sports Sciences at Semelweis University. Her research area is around group fitness and health promotion. She is self-confessed "gym junkie" and exercises most days. She is extremely social, enjoys travelling and is into adventure sports particularly canoeing,

**Goals and tasks:**

Sáríka has a strong work ethic, is systematic in her approach

**Spends her time:**

- Researching
- Exercising
- Social activities

**Reasons for doing course:** Sáríka became aware of OERuESP1 through an email subscription newsletter. She was particularly interested as it was developed by Professor Peter Terry and was aware of his work via her research and colleagues within her school. Her love of sport and exercise, plus the fact that the course was free, also motivated her to enrol. She has read the course spec and is particularly interested in non-western approaches to sport, fitness and well-being.

Figure A3. Sáríka Balik.

# Ken Masters



**Location:** Pittsworth, Queensland, Australia

**Job title:** Retired former businessman

**Major responsibilities:** Lions Club secretary. His garden!

**Demographics:**

- 74 years old
- Married
- Three children, five grandchildren

**Qualifications:** Professional and training qualifications

**Languages:** English

**Profile:** Ken is a retired businessman. He has led a rich professional life. He was in the army for fifteen years before running a small grain trading business in partnership with his brother. He retired in 2002 and has since maintained an active retired life. He would be described by others as a “real family man” and “good mate” and is engaged in an number of community activities including the Lions Club. He is a keen sports fan with a particular love of cricket. He is a member of a bowls club in nearby Toowoomba and plays once a week. He reads regularly and is always keen to learn new things.

**Goals and tasks:**

Ken is driven to remain as active as possible in his retirement both physically and mentally.

**Spends his time:**

- Gardening
- Social activities including bowling and Lions Club
- With family

**Reasons for doing OERuESP1:** Ken read about this course in an article in the Toowoomba Chronicle. It piqued his interest, because he had recently read “Standing My Ground: The Autobiography of Matthew Hayden”. In his book Hayden talked about the important role that sports psychologists played during his career in creating a winning mentality and culture. Given the course was free, Ken decided to sign up.

Ken would not describe himself as a technical person, however he uses the internet everyday to check emails, do personal research and read the news. He has a reasonably slow but functional internet connection.

Figure A4. Ken Masters.

## Appendix B

Table B1

*Content audit of first iteration of Elite Sport Performance: Psychological*

*Perspectives*

(<http://wikieducator.org/OERuESP1/>)

Item	Description	Relevance to new course	Action
Homepage	Welcome video. Course description. Post a WikiEducator Note. Course Registration.	Limited but course description content useful.	Repurpose course description content.  Create new welcome video.
Course resources	Target audiences. Sequence of study. Reference materials.	Target audiences relevant  Chapters from <i>Secrets of Asian Sport Psychology</i> .	Rewrite target audience text.  Reuse chapters.
Development team	Profile of development team.	Only Peter Terry bio.	Reuse and update Peter Terry bio.
Introduction	Welcome video (repeated).  Search Directory of Open Access Video.  Share article in resource bank.	Not relevant.	Discard.

Table B1 (continued)

<b>Item</b>	<b>Description</b>	<b>Relevance to new course</b>	<b>Action</b>
Context evaluation	Context evaluation video.  Additional content relevant to learning task.  Six Pillars of Elite Sport Performance.	Six Pillars of Sports Performance provides useful contextual information.	Reuse Six Pillars of Sports Performance image and accompanying content.
Psychological influences on elite sport performance	Psychological influences on elite sport performance video.  Additional content relevant to learning task.	Useful suggested areas for learners to look for articles i.e., anxiety, concentration, moods, and emotions, motivation, self-confidence, team dynamics.	Reuse areas but structure content around them (plus other content).
Performance enhancement strategies	Performance enhancement strategies video.  Develop mental training program.	Mental training program development remains very relevant to new course and is core competence.	Keep mental training program as summative task.
Resources bank	Space where learners share resources	Few resources were shared. Intention was to share mental training programs.	Create new video to support learning task  Share mental training programs in new course, but use different strategy.
Certificate of completion	Learners receive on completion.	No completers but useful.	Create new certificate of completion. Do not overemphasise importance over learning content to avoid undermining intrinsic motivation.

## Appendix C

**Content plan for *Elite Sport Performance: Psychological Perspectives***

The content plan below was developed during the course development in April 2015 and broadly articulates the content for the course. Its purpose was to provide more detail on both topic content and learning activities. As course development was moved forward, some content was changed, expanded or dropped based upon feedback, iteration, or practicality. The original document is provided.



**I. Course introduction and orientation (Let's go!)**

<b>Let's go!</b>		
<b>Block</b>	1	
<b>Allocated time</b>	2 hours	
<b>Overall purpose</b>	A general introduction to the course.	
<b>Summary (with relevance to SDT design principles)</b>	1. Introduce course	Informational [supporting autonomy and competence] Welcoming [Relatedness supporting]
	2. Offer real world example profile of an elite athlete	Meaningful context [competence supporting, intrinsically interesting?] [Authentic learning scenario]
	3. Optional tour of interface	Competence building (if learner feels unfamiliar with or uncertain of interface) Autonomy building (learner can choose not to engage with or quit tour at any time if feeling competent with interface)
	4. Give course outline	Informational [supporting autonomy and competence]
	5. Give possible learning outcomes	Informational [supporting autonomy and competence]
	6. Moderator introduction	Welcoming [Relatedness supporting]
	7. Learner posts in forum introducing themselves and sharing reflection on elite sport psychology	Opportunities to connect with others [autonomy supporting] Share knowledge [build sense of autonomy and competence] Reflection [authentic learning principle]
<b>Possible Activities</b>	1. Watch introductory video 2. Read relevant content that orientates learner 3. Post on discussion forum if learner wishes to do so	
<b>Competencies</b>	1. Learner can navigate through learning interface 2. Learner understands what the course is about and what to expect 3. Learner can post on forum and respond to early discussion	
<b>Required content</b>	1. Introductory video	Yes?
	2. Introductory text	Adapt from first course?
	3. Profile of elite athlete	Adapt from <i>Secrets of Asian Sports Psychology</i> ?

**II. What you need to know**

<b>a. The role of the sport psychologist/Introducing psychological skills</b>		
<b>Block</b>	2	
<b>Allocated time</b>	2 hours	
<b>Overall purpose</b>	Offering an introduction into the role of a sport psychologist and what psychological skills contribute to success in elite sport	
<b>Summary (with relevance to SDT design principles)</b>	1. Profile of a sport psychologist	Meaningful context [competence supporting, intrinsically interesting?]
	2. Psychological skills and elite performance – the extra 10%	Meaningful context [competence supporting, intrinsically interesting?] [Authentic learning scenario]
<b>Possible Activities</b>	1. Read profile of a sport psychologist – Rowing in Australia chapter 2. Reflect on the psychological skills of favourite athlete	
<b>Competencies</b>	1. Learner gets an insight into the work of a sport psychologist 2. Learner is introduced to the construct of psychological skills	
<b>Required content</b>	1. Introductory video	Introduce
	2. Introductory text	Introduce role of sport psychologist in the rowing in Australia chapter
	3. Supporting materials	Download rowing chapter from <i>Secrets of Asian Sports Psychology?</i>

<b>b. Motivation</b>		
<b>Block</b>	3	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Introducing motivation in elite sport context. Illustrating techniques that can improve or sustain motivation	
<b>Summary (with relevance to SDT design principles)</b>	1. Defining motivation and its importance in sport	Informational [supporting autonomy and competence]
	2. Intrinsic and Extrinsic motivation	Informational [supporting autonomy and competence]
	3. Goals and goal setting. [Testimony from sport psychologist]	Informational [supporting autonomy and competence]
	4. Tokens and rewards	Informational [supporting autonomy and competence]
	6. Dealing with demotivation	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	<ol style="list-style-type: none"> <li>1. Search for the word "Motivation" in <i>Secrets</i> and report back an example</li> <li>2. Measure your motivation (short 10 min online self-test)</li> <li>3. Set some goals for an elite tennis player (create persona)</li> <li>4. Motivate me! Scenario based exercise in which you have to help a demotivated athlete</li> </ol>	
<b>Competencies</b>	<ol style="list-style-type: none"> <li>1. Learner is introduced to a couple of motivational theories in elite sport</li> <li>2. Learner gains an insight to possible interventions</li> <li>3. Learner has experience of goal-setting as a motivational technique</li> <li>4. Learner understands in what ways token and rewards can be effective in elite sport</li> </ol>	
<b>Required content</b>	1. Introductory text and images	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology Look for any openly licence video
	4. Self-test quiz	Design in LearnDash
	5. Persona	Create tennis player persona

<b>c. Anxiety</b>		
<b>Block</b>	4	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Appreciate the relationship between anxiety and performance and how high levels of anxiety can be alleviated	
<b>Summary (with relevance to SDT design principles)</b>	1. Defining anxiety	Informational [supporting autonomy and competence]
	2. Control and catastrophe. Two models of anxiety.	Informational [supporting autonomy and competence]
	3. Alleviating anxiety I: Relaxation techniques	Informational [supporting autonomy and competence]
	4. Alleviating anxiety II: Self-control techniques	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	<p>1. Reflect on a time in your life when you felt anxious (e.g. an exam) and how you coped</p> <p>2. Have a go. Try the five-breath technique over a couple. Report back on how you felt after (noting that it requires practice)</p> <p>3. Read the Aerials Skiing in China chapter in <i>Secrets</i> and reflect on specific causes of anxiety in this particular sport. What interventions have taken place?</p>	
<b>Competencies</b>	<p>1. Learner is introduced to anxiety in elite sport</p> <p>2. Learner appreciates the importance of control in competition anxiety and the catastrophic effects on performance of high levels of completion anxiety</p> <p>3. Learner experiences the possibilities of relaxation techniques</p> <p>4. Learner understands some cognitive behavioural approaches that have been shown to be effective</p>	
<b>Required content</b>	1. Introductory text and images	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology
	4. Five breath test instructions	Source (ask permission if necessary)

<b>d. Mood and emotion</b>		
<b>Block</b>	5	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Understand that different mood profiles and emotional outputs can have positive and negative impacts on performance. Consider some mood regulation strategies.	
<b>Summary (with relevance to SDT design principles)</b>	1. Distinguish mood from emotion	Informational [supporting autonomy and competence]
	2. Mood profiles	Informational [supporting autonomy and competence]
	3. Create your profile	Informational [supporting autonomy and competence]
	4. Mood regulation strategies	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	1. Take the BRUMS test (optional) 2. Asian Approaches. Examine approaches from the Chinese Diving Team and Japanese Judo team. Possible differences in approach?	
<b>Competencies</b>	1. Learner gains an understanding of the difference between mood and emotion 2. Learner can distinguish between different mood profiles and likely performance outcomes 3. Learner can recommend possible strategies to build an Everest mood profile	
<b>Required content</b>	1. Introductory text and images	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology
	4. HTML5 Mood profiles	This will need to be created. Perhaps ask Media section of Learning
	4. BRUMs test	Link to In the Mood website (need to think about how this is communicated)

<b>e. Self-confidence</b>		
<b>Block</b>	6	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Demonstrate the dynamic nature of confidence and the strategies that can be used to boost confidence.	
<b>Summary (with relevance to SDT design principles)</b>	1. What does being self-confident actually mean?	Informational [supporting autonomy and competence]
	2. Benefits of self-confidence (with examples)	Informational [supporting autonomy and competence]
	3. Self-efficacy	Informational [supporting autonomy and competence]
	4. Threats to confidence	Informational [supporting autonomy and competence]
	5. Boosting confidence	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	<ol style="list-style-type: none"> <li>1. Consider when you felt most confident (in sport or other aspects of your life)</li> <li>2. Give an example of a confident athlete. What do you think makes them so confident?</li> <li>3. Read the chapter on Iranian Wrestling. Consider in particular the self-confidence of the athletes</li> <li>4. [Optional] Learner given a case study scenario (self-confident &gt; loss of confidence &gt; return of confidence) and is asked to propose an intervention.</li> </ol>	
<b>Competencies</b>	<ol style="list-style-type: none"> <li>1. Learner understands what self-confidence is in an elite sport context and that confidence is a dynamic construct</li> <li>2. Learner appreciates the concepts proposed by Self-Efficacy theory</li> <li>3. Learner can interpret the nuances of an athletes testimony and relate it to self-efficacy theory</li> <li>4. Learner is given a scenario and offers some possible interventions.</li> </ol>	
<b>Required content</b>	1. Introductory video	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology
	4. Adequate instructions for the case study exercise	As required

<b>f. Concentration</b>		
<b>Block</b>	7	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Understand what concentration is an example training skills that can enhance concentration further	
<b>Summary (with relevance to SDT design principles)</b>	1. Unpacking concentration: a) Selective attention b) attentional focus c) situational awareness d) shifting focus	Informational [supporting autonomy and competence]
	2. Neurological processing i.e. what my brain has to do!	Informational [supporting autonomy and competence]
	3. Errors in concentration and distractions	Informational [supporting autonomy and competence]
	4. Concentration training I: Simulation and planning	Informational [supporting autonomy and competence]
	5. Concentration training II: Pre-event routines	Informational [supporting autonomy and competence]
	6: Concentration training III: Centering	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	1. Find examples in <i>Secrets</i> that talk about attentional focus and discuss with others the points being made 2. Scenario: On the putting green. Identify possible distractions and suggest ways to manage concentration	
<b>Competencies</b>	1. Have an overview of concentration 2. Appreciate how concentration can be undermined by other sensory inputs 3. Suggest ways to manage concentration and provide an elite athlete techniques to refocus when attention wavers	
<b>Required content</b>	1. Introductory video	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology
	4. Possible HTML5 animation to support putting green scenario	As required

<b>g. Imagery and self-talk</b>		
<b>Block</b>	8	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Understand why these two techniques can be so powerful in elite performance. Draw on constructs thus far	
<b>Summary (with relevance to SDT design principles)</b>	1. Summarise psychological constructs looked at thus far	Informational [supporting autonomy and competence]
	2. Imagery and imagery perspectives	Informational [supporting autonomy and competence]
	3. Imagery for motivation and confidence	Informational [supporting autonomy and competence]
	4. Imagery for skill development e.g. rehearsal	Informational [supporting autonomy and competence]
	5. Self-talk to change mood	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	1. Read about Yani Tseng (Taiwanese golfer) including a video. Reflect on her golfing skills e.g. putting and how she may have deployed imagery 2. Suggest ways in which a professional golfer can utilise positive self-talk to change mood	
<b>Competencies</b>	1. Make links between imagery and self-talk, and they may have a positive effect on the psychological constructs discussed so far 2. Infer how imagery has been used within a specific sporting task e.g. driving, pitching, and putting in golf 3. Understand how negative self-talk can affect confidence (and therefore mood) and suggest ways in which positive self-talk can	
<b>Required content</b>	1. Video: Yani Tseng's Year <a href="https://www.youtube.com/watch?v=9FvaPcTYBvw">https://www.youtube.com/watch?v=9FvaPcTYBvw</a>	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology: Golf in Taiwan chapter



<b>h. Music</b>		
<b>Block</b>	9	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Understand the performance improvement possibilities that music can contribute.	
<b>Summary (with relevance to SDT design principles)</b>	1. The power of music in sport and culture	Informational [supporting autonomy and competence]
	2. Synchronisation, mood, rhythm and BPM	Informational [supporting autonomy and competence]
	3. Interventions using music	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	<p>1. Discuss your favourite music, when you listen and how it affects your mood.</p> <p>2. How many BPM? Listen to a track via iTunes preview. Check the BPM using <a href="https://songbpm.com/">https://songbpm.com/</a> From this information make suggestions on interventions and musical taste of athletes (possible personas to be created here).</p>	
<b>Competencies</b>	<p>1. Consider the qualities of music and how it can have positive contributions on performance and mood</p> <p>2. Think about specific types of music and how they can be used.</p> <p>3. Understand contexts in which music may not be appropriate</p>	
<b>Required content</b>	1. Video: Possible introduction from Peter	
	2. Text for each section	As required
	3. Supporting materials	<p>List of music (playlist!)</p> <p>Athlete personas including musical tastes iTunes preview links and link to BPM checker</p> <p>Optional: Music is mentioned in a number of chapters in the open textbook. Suggestions can be made to go and take a look.</p>

<b>i. Group dynamics I</b>		
<b>Block</b>	10	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Introducing the unique characteristics of teams	
<b>Summary (with relevance to SDT design principles)</b>	1. Qualities of great teams	Informational [supporting autonomy and competence]
	2. Team dynamics	Informational [supporting autonomy and competence]
	3. Group cohesion	Informational [supporting autonomy and competence]
	4. Interventions to improve dynamics and cohesion	Informational [supporting autonomy and competence]
<b>Possible Activities</b>	1. Brainstorm qualities of a great team 2. Read All Blacks Chapter in Secrets as a Case Study paying particular attention to group dynamics and team cohesion/culture 3. Team culture and distinctiveness slideshow e.g. baggy green cap, European Ryder Cup team, Brazilian samba style, New York Yankees cap, 1972 USSR basketball team (ideological), AFL team songs	
<b>Competencies</b>	1. Think about the qualities of winning teams and how they are structured 2. Gain a working knowledge of team dynamics and group cohesion e.g. individual 3. Explain how an effective team climate can be achieved	
<b>Required content</b>	1. Text for each section	As required
	1. Supporting materials	Possible HTML5 interactive showing a team sociogram New Zealand All Blacks Chapter Slideshow on team culture and distinctiveness

<b>j. Group dynamics II</b>		
<b>Block</b>	11	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Explore group process further. Specifically leadership and communication	
<b>Summary (with relevance to SDT design principles)</b>	1. Captain Marvel. Qualities of team leaders	Informational [supporting autonomy and competence]
	2. Leadership style	Informational [supporting autonomy and competence]
	3. Communication process	Informational [supporting autonomy and competence]
	4. Listening and empathy	Informational [supporting autonomy and competence]
	5. When communication breaks down. Interventions	Informational [supporting autonomy and competence]
	6. Video summarising blocks 2-10	
<b>Activities</b>	<p>1. Brainstorm qualities of a great leader e.g. Winston Churchill, Angela Merkel, Steve Jobs, Steve Waugh</p> <p>2. Read Sri Lanka Cricket Chapter in Secrets as a Case Study paying particular attention to team leadership and communication</p> <p>3. Scenario: Write some guidelines for a relay coach to help him communicate more effectively with his team. Share with others for feedback.</p>	
<b>Competencies</b>	<p>1. Think about leadership qualities and how they can be applied in sport</p> <p>2. Understand how good leadership and effective communication can enhance team dynamics</p> <p>3. Critically apply what has been learned in a scenario based exercise</p>	
<b>Required content</b>	1. Video: Possible summary of Block 2-10 from Peter	
	2. Text for each section	As required
	3. Supporting materials	Coach persona for activity Sri Lanka cricket chapter

## You specialise

At this point in the course the learners will be briefly introduced to three options to “specialise” in. These are injury response, overtraining, and cultural considerations. Once they have made the decision they have the opportunity to engage further (and if they really want to, go back and do other blocks). Some of the activities will stretch the learner beyond what they have yet experienced, but it competency levels should be quite high for those who have stuck with the course.

<b>Option A: Injury response</b>		
<b>Block</b>	12a	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	To understand some of the psychological risks and impacts associated with injury. To apply some of the techniques already introduced in the context of an injured athlete	
<b>Summary (with relevance to SDT design principles)</b>	1. The psychological trauma of injury.	Informational [supporting autonomy and competence]
	2. Fear and anxiety (interventions)	Informational [supporting autonomy and competence]
	3, Motivation and depression (interventions)	Informational [supporting autonomy and competence]
	4. Injury response (psychological skills)	Informational [supporting autonomy and competence]
<b>Activities</b>	1. Brainstorm as to why injury can have negative psychological impacts in elite sport e.g. loss of routine, loss of control, self-doubt, physiological effects (loss of fitness), neurotransmitter deprivation 2. Read about Manny Pacquiao’s approach to risk of physical injury in <i>Secrets</i> 3. Watch Todd Gurley (Atlanta Falcons) on returning from injury. What psychological skills will he be using? What other skills could he draw on <a href="https://www.youtube.com/watch?v=r3y2ZsLy_D0">https://www.youtube.com/watch?v=r3y2ZsLy_D0</a>	
<b>Competencies</b>	1. Understand how serious a threat injury can be on the psychological well-being of an athlete 2. Have insights into psychological skills required to cope with the injury anxiety 3. Be able to make recommendations to an elite athlete on injury recovery	
<b>Required content</b>	1. Introductory video	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology YouTube videos

<b>Option B: Overtraining</b>		
<b>Block</b>	12b	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Understand how overtraining (or over practicing) can be detrimental to performance	
<b>Summary (with relevance to SDT design principles)</b>	1. Benefits of and adaption to training	Informational [supporting autonomy and competence]
	2. Exhaustion and burnout	Informational [supporting autonomy and competence]
	3. Effects on motivation e.g. if training regulated by a coach	Informational [supporting autonomy and competence]
	4. Preventative measures	Informational [supporting autonomy and competence]
<b>Activities</b>	<p>1. Possible online training task where learners can measure their performance over time</p> <p>2. Read about the novel ways in which Chinese gymnasts deal with mental fatigue at the Beijing Olympics. Think about why music could be so effective in this example</p> <p>3. Read article about burnout in junior elite tennis players  <a href="http://www.americankinesiology.org/AcuCustom/Sitename/Documents/DocumentItem/2053.pdf">http://www.americankinesiology.org/AcuCustom/Sitename/Documents/DocumentItem/2053.pdf</a> based on findings offers three pieces of advice for a) Players b) Coaches</p>	
<b>Competencies</b>	<p>1. Understand how athletes adapt to training and potential psychological stresses associated with training</p> <p>2. Identify some of the symptoms of burnout</p> <p>3. Offer advice on avoiding burnout</p>	
<b>Required content</b>	1. Introductory video	
	2. Text for each section	As required
	3. Supporting materials	Secrets of Asian Sport Psychology Gould, Tuffey, Udry, and Loehr (1996b) paper on reducing burnout in young tennis players

<b>Option C: Cultural considerations</b>		
<b>Block</b>	12c	
<b>Allocated time</b>	4 hours	
<b>Overall purpose</b>	Understand how cultural differences require distinct approaches for sport psychology practitioners	
<b>Summary (with relevance to SDT design principles)</b>	1. Culture in sport	Informational [supporting autonomy and competence]
	2. Asian Sport Psychology	Informational [supporting autonomy and competence]
	3. Religion and spirituality in elite sport. Case studies Manny Pacquiao/ Iranian wrestling	Informational [supporting autonomy and competence]
	4. Cultural awareness of practitioners	Informational [supporting autonomy and competence]
<b>Activities</b>	<p>1. Watch Manny Pacquiao training video. Think about how his psychological skills, personality and beliefs come together  <a href="http://www.highsnobiety.com/2015/04/28/nike-manny-pacquiao-training-video/">http://www.highsnobiety.com/2015/04/28/nike-manny-pacquiao-training-video/</a></p> <p>2. What aspects of Asian Sport culture distinguish itself from Western approaches?</p> <p>3. Read Chapter 4 of Cultural Sport Psychology  <a href="https://eprints.usq.edu.au/4382/3/DocTerry.pdf">https://eprints.usq.edu.au/4382/3/DocTerry.pdf</a></p> <p>You have just been given the role of team sport psychologist for Muangthong United F.C. in the Thai Premier League. Reflect on the preparations you would make before starting the job.</p>	
<b>Competencies</b>	<p>1. Understand how cultural awareness is an important skill for sport psychologists when working in different cultures that are not their own</p> <p>2. Reflect on examples given and apply knowledge to other scenarios</p>	
<b>Required content</b>	1. Introductory video	
	2. Text for each section	As required
	3. Supporting materials	Secrets Manny Pacquiao video Cultural sport psychology book chapter (available on USQ eprints)

**III. Build a mental training program**

This will be the final activity and involve the learner developing a mental training program for an athlete based upon the psychological skills training techniques they have learned. A certificate of completion will be issues as well as feedback on the plan.

Appendix D

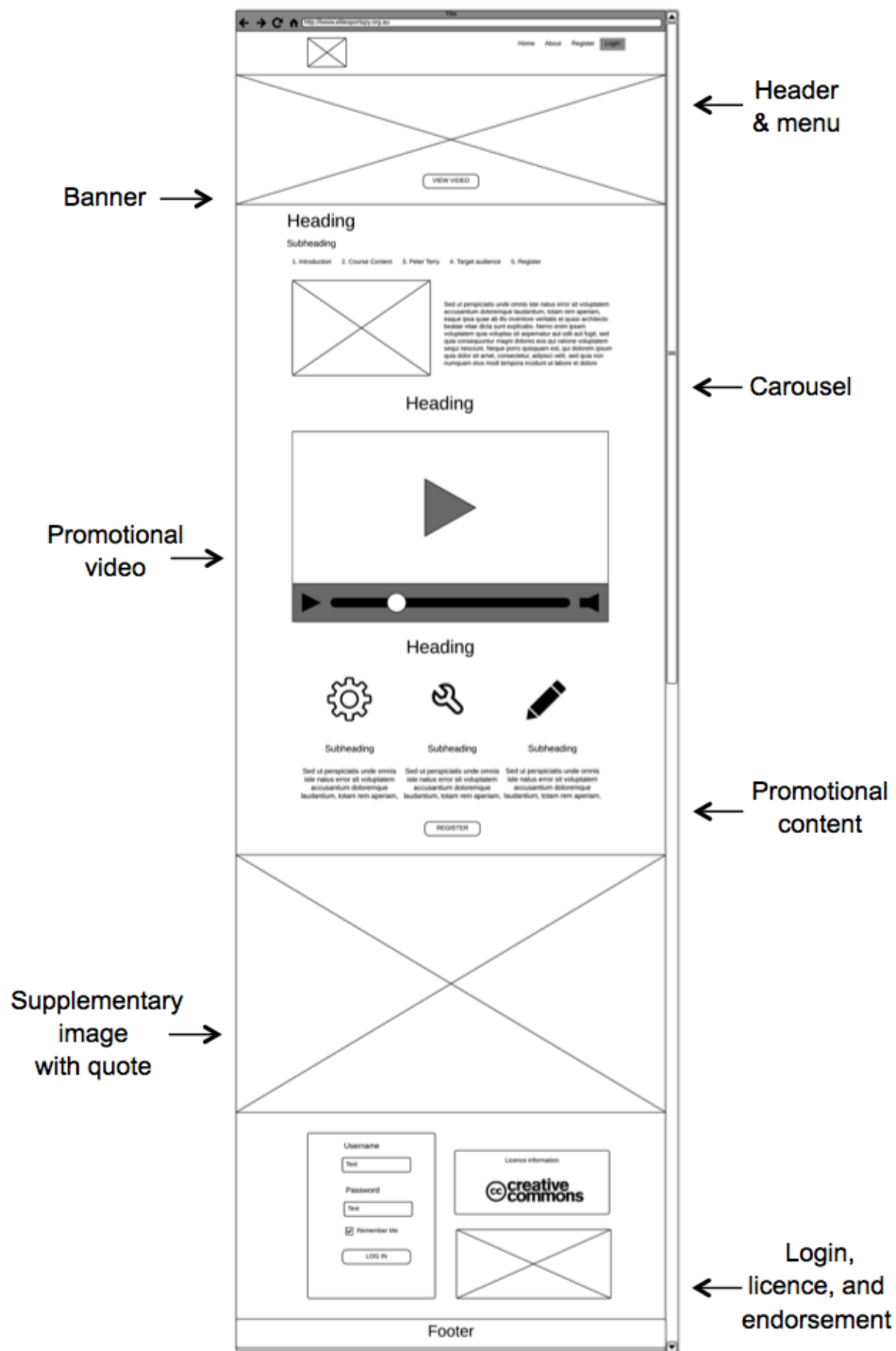


Figure D1. Wireframe of homepage showing functional elements.



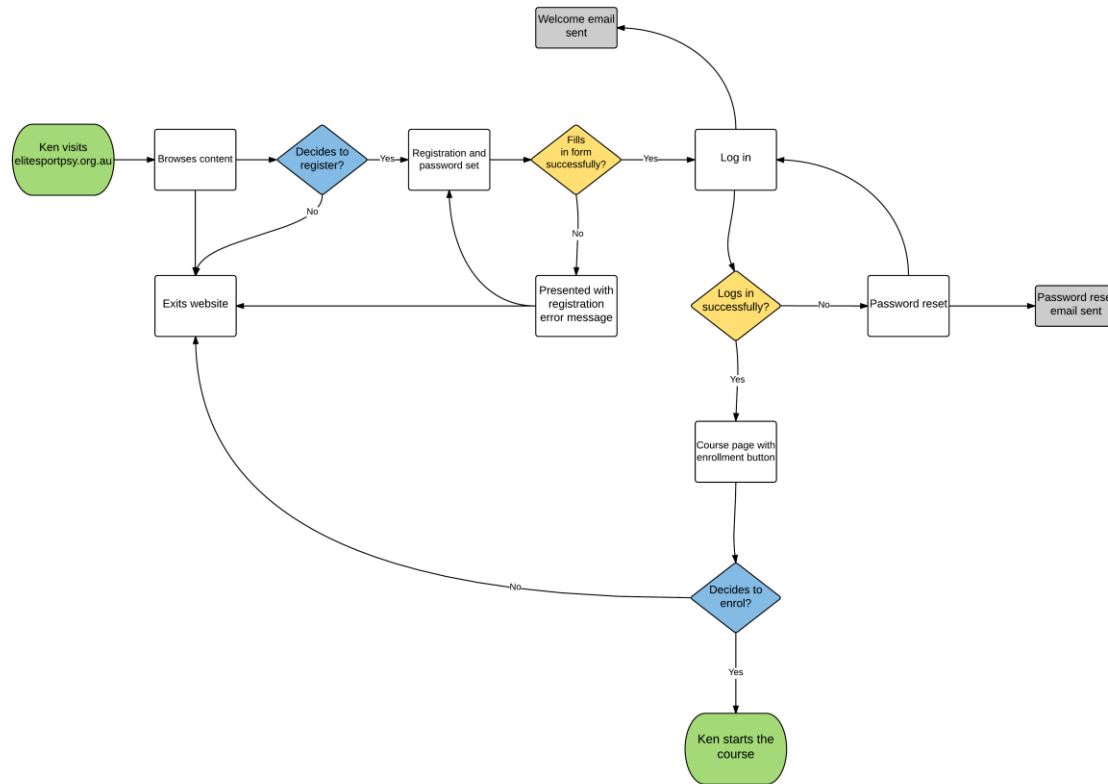


Figure D2. User interaction flow to enrol on *Elite Sport Performance: Psychological Perspectives*.

## Appendix E

Table E1

*Plugins installed to provide functionality for Elite Sport Performance: Psychological Perspectives*

<b>Plugin</b>	<b>Function</b>
Akismet	Protects website from spam comments.
bbPress	Forum software to facilitate group discussions and share personal reflections.
bbPress Reports	Reporting tool providing activity data for bbPress.
Code Snippets	Adds bespoke functionality to the website, for example the concentration grid was created using this tool.
Contact Form 7	Used for verification of user.
Export User Data	Exports online activity data e.g., date of last login.
Hide Admin Bar	Customises how administration interface appears to different users e.g., administrators, editors, and users.
LearnDash LMS	The learning platform used to present the course.
LearnDash ProPanel	Provides real time data of course enrolments, course progress, and submission of mental training programs.
P3 Plugin	Allows administrator to check the performance of installed plugins i.e., that no plugin is providing stress on the server.
Quiz reporting extension	Allows research data collected to be exported as CSV file for later analysis.
Slider revolution	Provided slider functionality for homepage.
TablePress	Used to create high quality data tables.
Theme My Login	Allow customisation of login and registration forms, as well as providing extra security
Ultimate Video Player	Provided customisation of video player so that all OER videos could be embedded irrespective of source e.g., Vimeo, YouTube.
WP Better Emails	Allowed bespoke design of emails sent to learners therefore providing continuity in branding of webpages and emails.

## Appendix F

Table F1

*Learning activities for Elite Sport Performance: Psychological Perspectives*

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
1 <b>Welcome</b>	Welcome video	Participants watch a welcome video presented by Professor Peter Terry.
2 <b>Welcome</b>	Introduce yourself	Participants are encouraged to share why they are doing the course and their sporting interests.
3 <b>Introducing psychological skills</b>	Watch video to “spark” interests – <i>What does it take to be a champion athlete?</i>	Participants watch an introductory video from Ted Talks and Martin Hagger.
4 <b>Introducing sport psychology</b>	Watch video and read more. London 2012 – <i>The importance of sport psychology</i>	Participants watch a video before opening toggle box to reveal further information.
5 <b>The role of the sport psychologist</b>	Sport psychologist profiles	Participants can navigate through and read profiles of 8 experts who will appear in each topic.
6 <b>Motivation</b>	Watch video to “spark” interest. <i>Stop Dreaming. Motivational track and field montage</i>	Participant watch video. Its intention is to help them start thinking about the high levels of motivation required for elite performance.

Table F1 (continued)

Topic area	Activity	Description
7 Describing motivation	<i>Can you think of an example of when you felt motivated?</i>	Self-reflection activity with four points to think about. Open toggle box to reveal more.
8 Describing motivation	Need for achievement vs. fear of failure	Interactive graph allowing users to explore motivational personality types.
9 Describing motivation	Intrinsic or extrinsic motivation	Participants watch video about Michael Jordan's drive and share their thoughts on his personality, motivation, values.
10 Describing motivation	Course textbook chapter	Learners encouraged to read chapter on short track motivation.
11 Motivational strategies	Listen to interview	Participants can listen to sport psychologist Michael Lloyd talk about of working with an Olympic swimmer maintaining motivation following injury.
12 Motivational strategies	Develop a goal setting plan	Participants have the opportunity to develop about a goal setting plan using a recommended technique from Professor Peter Terry.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
13 Motivational strategies	Course textbook chapters	Three chapters that include information on goal setting are recommended reading.
14 Token rewards	Share your strategies	Participants are encouraged to share their experience of using token rewards with others.
15 Motivation summary and go further	Independent reading	Participants are given some links to resources if they wish to explore motivational theory further.
16 Motivation summary and go further	<i>Climbing Mount Everest</i>	A full version of Michael Lloyd's testimony with some points offered for self-reflection.
17 <b>Anxiety</b>	Brazil 2014 world cup failures	Participants watch a few videos about Brazilian team anxiety level, which contributed to catastrophic exit.
18 What is anxiety?	How do you cope with challenging situation	Self-reflection on coping with anxiety.
19 What is anxiety?	The stress of diving	Videos and textbook chapter on how divers cope with diving anxiety.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
20 Responses to stress	Video of Jian Yang dive	Video shows near perfect dive under pressure. Participants may make connections with previous activity if they did it.
21 Responses to stress	Sport Completion Anxiety Test	Learners can take the SCAT and find out their own levels of anxiety in a sporting competition context.
22 Relaxation techniques	Learn to relax	Participants can listen to and follow a series of relaxation techniques that many athletes use.
23 Relaxation techniques	Course textbook chapters	Participants can read about two sports that make extensive use of relaxation techniques.
24 Relaxation techniques	Yoga training	Activity for sharing yoga experiences with others.
25 Anxiety summary and go further	Watch videos to explore further	Two video resources are shared showing elite athletes coping with athletes.
26 <b>Mood and Emotion</b>	John McEnroe videos	Participants watch two videos showing McEnroe's brilliance and his explosive temper.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
27 Mood profiles	Mood profiles interactive	Participants can interact with mood profile graphs.
28 Mood profiles	Thinking about mood profiles	Reflection activity on optimal moods with toggle box to reveal more.
29 Mood profiles	Assess your mood	Participants have the opportunity to take the <i>In The Mood</i> BRUMS test.
30 Mood regulation strategies	How to you manage your mood?	Participants explore mood regulation strategies.
31 Mood regulation strategies	Pep Talks	Participants can watch Al Pacino's famous pep talk from <i>Any Given Sunday</i> .
32 Mood and emotion summary and go further	Independent reading	Examples of mood profiling from two chapters from <i>Secrets of Asian Sport Psychology</i> .
33 <b>Self-confidence</b>	Listen to audio	Muhammad Ali – I'll show you how great I am. A personification of self-confidence.
34 The nature of self-confidence	Feeling confident?	Self-reflection activity plus open toggle box to reveal more.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
35 Threats to self-confidence	Getting back on the bike	Discussions exercise on recovering from bike crashes. Participants watch a number of Tour De France crashes, then considers issues plus watches a second video on advise on mentally recovering from a bike crash.
36 Threats to self-confidence	The Secret Footballer on loss of confidence	Reflection activity on footballer's loss of confidence.
37 Boosting self-confidence	UPWARD approach interactive	Interactive slideshow detailing an approach to building self-confidence.
38 Boosting self-confidence	Your personal images of self-confidence	Participants share their own images of self-confidence and comment on others.
39 Self-confidence go further	Independent reading	Read wrestling chapter of Secrets of Asian Sport Psychology which details Iranian wrestlers approach to building confidence.
40 <b>Concentration</b>	Sebastian Vettel video	Participants watch video of Vettel driving and reflect on the importance of concentration in sport.



Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
41 Concentration and attention	Test your concentration activity	Participants take a concentration grid exercise to better understand how difficult it is to optimise concentration.
42 Distractions and concentration errors	Independent reading	Participants read the shooting in India chapter.
43 Distractions and concentration errors	Identifying details and distractions	Reflection exercise and toggle box.
44 Concentration training techniques	Independent reading	Simulation training techniques of Korean archers.
45 Concentration training techniques	Simulation activity	Participant suggests ways in which a javelin thrower can simulate a competition environment.
46 Concentration training techniques	Centering audio	Participants listen to centering exercise.
47 Concentration training techniques	Techniques for responding to errors	Participants watch Pele miss following brilliant dummy in 1970 World Cup.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
48 Summary and go further	Race plans	Participants discover more about attentional processes in rowing including reading Rowing chapter and watching a video demonstrating how attention can be trained.
49 <b>Imagery</b>	Take a ride on a bobsled	Immersive Google glass first person view of bobsled run followed by expert testimony of using imagery for bobsled medal winning team.
50 Introduction to imagery	Have a go at imagery	Participant given instructions to have a go at imagery and then share.
51 Imagery techniques	Creating an image	Quick reflection on whether participant can create an image with toggle box to help.
52 Imagery in competition	Taking penalties	Activity in which participants consider how imagery could be used in a penalty shootout. Learners first watch some videos and then share their own insights.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
53 Imagery in competition	Independent reading	Participants read about Anna Meares's use of imagery.
54 Imagery in competition	Design an imagery scenario	Participants develop an imagery scenario in which something goes wrong and the images a response.
55 Imagery in competition	Imagery in action	Watch two videos on elite athletes using imagery.
56 Summary and go further	Imagery in action: Golf and Judo	Participants can read two chapters from the book that use imagery and then compare and contrast how the two sports use imagery.
57 Summary and go further	Imagery in action: Michael Phelps	Watch video about Michael Phelps preparation using imagery.
58 <b>Music</b>	Music synonymous with sport	Music videos of Chariots of Fire theme and Eye of the Tiger from Rocky III. Also videos of music in Olympic games both for the opening ceremony and in competition. Finally, Spotify Running as an example of use in fitness industry.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
59 Music and sport performance	Music and You	Participant contributes to their use of music both in sport and in life generally.
60 Music for training an skill development	Selecting music	Participants select music for specific training activities.
61 Music for competition	Messing with tradition	Participants offer opinions on whether the use of headphones at Wimbledon is appropriate.
62 Summary and go further	Independent reading	<i>Conversation</i> piece on music in elite sport by Peter Terry.
63 Summary and go further	Create a playlist	Independent activity in which learners create a playlist for fitness activities.
64 <b>Group Dynamics</b>	Illustrative video	Participants watch video of rugby World Champions doing Haka – an example of a strong team identity.
65 Introducing group dynamics	What are the qualities of a successful team?	Reflection activity on the ingredients that make of a successful team.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
66 Introducing group dynamics	Remembering the Titans	Video using Remembering the Titans to explain forming, storming, norming, performing, adjourning.
67 Introducing group dynamics	Three factors that contribute to a team's success	Participants watch a video that illustrates team dynamics then a toggle box that points out that friendship is less important than may be thought.
68 Group cohesion	A cohesive team	Self-reflection on the qualities of a cohesive team.
69 Group cohesion	Symbols of team distinctiveness	Participants watch video of baggy green cap presentation and then share their own examples.
70 Building an effective team	This isn't working	Self-reflection on how team problems were overcome.
71 Summary and go further	Independent reading	Three chapters from <i>Secrets of Asian Sport Psychology</i> .
72 Summary and go further	Team of Firsts	<i>Team of Firsts</i> is an independent movie charting the building of an American Football team.

Table F1 (continued)

<b>Topic area</b>	<b>Activity</b>	<b>Description</b>
73 <b>Build a Mental Training Program</b>	Introductory video	Participants are oriented around how to prepare mental training program.
74 <b>Build a Mental Training Program</b>	Independent reading for final activity	Participants read chapters of their choosing to prepare to build mental training program.
75 <b>Build a Mental Training Program</b>	Choose an athlete	Participant interacts with slider to find out more about each athlete and then choose one for development of mental training program.
76 <b>Build a Mental Training Program</b>	Write and upload mental training program	Participants write and upload mental training program. Are also encouraged to make comments on others. They then receive a certificate of completion.

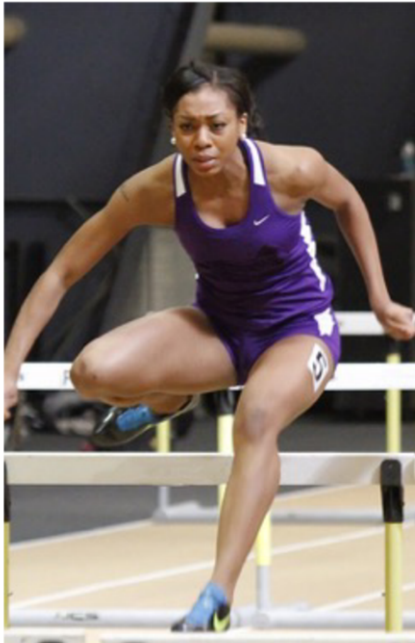
## Appendix G

**Elite Athlete Personas for Mental Training Program Summative Activity**

Eight elite athlete personas were created for learners to develop a mental training program. In a similar vein to the user personas these were made as authentic as possible. The eight personas were:

- **Persona 1:** Denise Flowers. A British 100m hurdler with injury anxiety.
- **Persona 2:** Kenji Ito. A Japanese snowboarder at risk of burnout.
- **Persona 3:** Lucy Branch. An Australian gymnast with a number of psychological issues including problems of concentration and self-confidence
- **Persona 4:** Akil Rao. An Indian archer who is placing too much pressure on himself in training and is therefore underperforming.
- **Persona 5:** Ellie Raymond. An American tennis player with issues of anxiety and self-confidence.
- **Persona 6:** Abdullah bin Suleman. A Malaysian soccer player who is not cohering with other team members as well as having anxiety issues.
- **Persona 7:** Wang Jie. A Chinese golfer with a sub-optimal mood profile.
- **Persona 8:** Donna Katona and Kata Baros. A rowing pair with a number of problems associated with group dynamics.

# Denise Flowers



**Location:** Birmingham, United Kingdom

**Role:** 110m Hurdler, Birchfield Harriers  
**Major responsibilities:** Part-time financial advisor

**Demographics:**  
•29 years old.  
•Married with young son

**Languages:** English

**Profile:** Denise is 110m hurdler who represents the Birchfield Harriers athletics team in Birmingham, United Kingdom. She is powerful sprinter with a natural hurdling technique and has been a member of the Birchfield Harriers (a premier UK athletics club) since her teenage years. During that period she has raced in the British Championships six times, finishing third in her event in 2007.

At an earlier stage of her career she was considered capable of moving to international level, but her career has been blighted by a persistent hamstring injury.

She has recently returned from 18 months away from the sport to have a baby and is training for the British Athletics Challenge Series. Her training has been going well, but her coach feels that she is still holding back from her best performances.

**Personality:** Denise sets high standards for herself in all aspects of her life.

**Notable performances:** English National Champion 2004, Third British Championships 2007

**Spends her time:**  
•With her son  
•Very little time to relax

Figure G1. Denise Flowers.



**Scenario**

You have been approached by Denise and her coach to consider the psychological barriers that are holding her back. Her fitness is back to the levels that she had before she had her baby and no injury problems have occurred although recovery times are longer which is not uncommon as an athlete gets older or has had chronic injury problems.

From a technical standpoint, her hurdling is not as fluid as it should be and her times are down as a result. Denise and her coach both agree that she is fearful of being injured. She also seems to be putting a lot of pressure on herself by trying to juggle her training, looking after a young child and her part-time role as a financial advisor.

**The Task**

- 1) Describe the psychological issues Denise may be experiencing in more detail
- 2) Develop a psychological skills training plan that could help Denise overcome some of these problems
- 3) What advise could you give to Denise's coach to help her spot when Denise is at risk of injury?

*Figure G2. Denise Flowers (continued).*

# Kenji Ito



**Location:** Niseko, Japan

**Role:** Competitive snowboarder

**Major responsibilities:** Partner in a local video production company

**Demographics:**

- 20 years old.
- Single

**Languages:** Japanese

**Profile:** Kenji Ito is a talented freestyle snowboarder who is keen to make a great leap forward in his competitive career. He has competed in a number of local competitions including winning the 2013 Saj Hokkaido Halfpipe Championship. Last year he entered the national half pipe championships for the first time and finished a disappointing fifteenth. At the time he blamed his equipment on a poor finish, but came to realise that this was him making excuses.

He is now training hard for the next championships including attempting to execute a triple cork in the halfpipe, one of the toughest tricks in snowboarding, which even the great Shaun White has been unable to execute. He is not there yet but believes that he can do it if he trains hard enough.

He is balancing his training with running a production company which produces snowboarding video footage. It is at times stressful work and he is beginning to feel very tired.

**Personality:** Sets high personal standards. A tendency to compare himself to other athletes

**Notable performances:** Saj Hokkaido Halfpipe Champion 2013

**Spends his time:**

- Working
- Loves snowboarding culture including fashion and hip-hop

Figure G3. Kenji Ito.

**Scenario**

You have been approached by Kenji Ito to consult on how to improve his freestyle performance. In particular he is seeking your help in the successful execution of a triple cork. You agree to help, but you are concerned that Ito is putting too much pressure on himself and is also at risk of burnout.

**The Task**

- 1) Suggest some psychological skills and strategies that could help him in reaching his goal
- 2) What advice can you offer him about the risks of burnout and how can these risks be mitigated?

*Figure G4.* Kenji Ito (continued).

# Lucy Branch



**Location:** Adelaide, Australia

**Role:** Gymnast (State Level Representative)

**Major responsibilities:** Works as a legal assistant. Just bought a house

**Demographics:**

- 19 years old.
- Single

**Languages:** English

**Profile:** Lucy is a gymnast with over ten years competitive experience. She specialises in the floor routine and has represented her state of South Australia in the last two Australian Gymnastics championships, finishing 20th and 11th respectively. In 2010 she became South Australian champion, but has been unable to convert that success at a higher level.

Although, a dedicated trainer, she is increasingly finding it more difficult to balance work commitments with her training regime and therefore putting pressure on herself. She is training hard for the next Australian Championships with a new routine which includes some tricky choreography to be mastered. She believe this new routine will help her get into the top 10 for this year's championships.

**Personality:** Lucy is quite a reserved person, although popular with team mates. She is deferential to authority figures and "try's to do as she is told" by her coach.

**Notable performances:** South Australia State Champion 2011, Runner-up 2012-2014, National Championship 20th (2013), 11th (2014)

**Spends her time:**

- Working
- Swimming and gym work (in accordance with her training plan)
- Painting and sculpting

Figure G5. Lucy Branch.

**Scenario**

You have recently been employed as a consultant to South Australia's state development clinics. These clinics are designed to improve the quality of South Australian gymnastics by a) Developing athletes b) Improving coaching.

As part of a clinic you are given time on a one to one basis with athletes (i.e. without coach). In a consultation with Lucy you realise that there are a number of issues of a psychological nature that need to be worked upon.

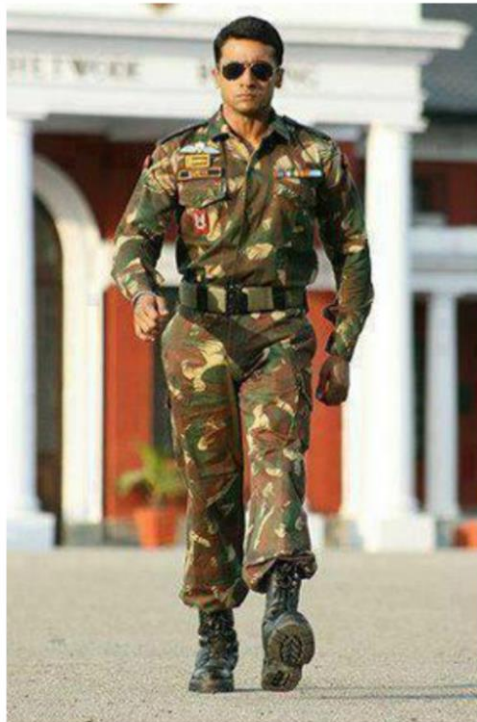
Most importantly, she is struggling to execute her new routine which is the most complex and technically difficult that she has ever attempted. The choice of music is a different style to previous routines (modern pop music as opposed to classical), involves more tumblers and is trickier to remember. On closer questioning you feel that there are issues with her concentration during execution, her confidence is sub-optimal, she is anxious about the routine and is not effectively communicating with her coach.

**The Task**

- 1) Describe the problems in more detail
- 2) Develop a mental training program that addresses each of these problems
- 3) Offer some advice as to how music could be used to help her

*Figure G6.* Lucy Branch (continued).

# Akil Rao



**Location:** Bangalore, India

**Role:** Archer in the Services Archery Team. Army Captain  
**Major responsibilities:** Moving up the rankings as a professional.

**Demographics:**

- 29 years old.
- Married

**Languages:** English, Hindi

**Profile:** Akil Rao represents the Services (SSCB) archery team and is also a captain in the Indian Army. He received his officer training from the prestigious National Defence Academy and joined the 5th Battalion of the Parachute Regiment in 2006. He has been posted on three tours of the Kashmir region. Aside from airborne duties, he is also a trained mountaineer. He is married with two young children,

Captain Rao took up archery whilst at Bishop Cotton Boys School and captained the school team. Once in the army, he represented the Defence Academy and later his regiment in army competitions, finishing in medal positions in four army championships. His quality saw him qualify for the Services archery team in 2008 and in 2012 he was placed on the reserve list for the Indian Olympic team after an excellent domestic season. Unfortunately, he has not made the leap to international competition, but remains strong domestically and importantly still believes he can make the step up.

He is highly disciplined, generally calm and mentally tough. However, he is returning from a chronic shoulder injury (originally received during a military training exercise ) which took him out of the sport for 12 months.

He has received excellent medical and physio care, and has made a good recovery, but the team coach is questioning his readiness for competition.

**Personality:** Captain Rao expects to win in everything that he does. Those who do not know him better often describe him as arrogant and over-confident.

**Notable performances:** Part of the winning Services team of the 2011 National Games

**Spends his time:** Enjoys indoor rock climbing. Keen supporter of The Royal Challengers IPL team,

Figure G7. Akil Rao.

**Scenario**

The Services archery coach is concerned about the psychological readiness of Captain Rao in returning to competition following his long injury. Rao watched from the sidelines as the team have a successful 2015 games in Kerala. Rao was pleased for his team mates but wants to be part of their success,. In his coach's opinion, he is simply trying to hard to prove himself in training and is performing well below his best. He is at risk of losing his place in the team.

Rao needs another month of recovery. In the meantime his coach is suggesting dividing his time between physio, fitness training, light practice, and for the first time mental training.

You have been asked to design a mental training program for Captain Rao. In particular you are asked to focus on the psychological skills that an elite archer needs to be successful for example high levels concentration and emotional control. He as also asked you to consider Rao's over arousal during training which could increase the possibility of further injury.

**The Task**

- 1) Consider the psychological skills required in archery and other precision sports.
- 2) Write a mental training program that addresses some of these skills
- 3) Tailor the programme towards the current needs of Captain Rao.

*Figure G8. Akil Rao (continued).*

# Ellie Raymond



**Location:** Tulane University, New Orleans, USA

**Role:** Tennis Scholar

**Major responsibilities:** Tennis scholarship at Tulane. Also majoring in Art History

**Demographics:**

- 19 years old.
- Single

**Languages:** English

**Profile:** Ellie has a tennis scholarship at Tulane University. Her natural talent in tennis was recognised at an early age in her home city of Baton Rouge where she won her first junior tournament aged 12. During her junior career she was ranked in the top 3 girls in Louisiana and qualified for the USTA National Championships at G18 and G16 grades, although never getting past the first round.

Her game is built around accuracy as opposed to power. Her serve is effective in terms of putting the returner off balance, but her ace count in most games is below average. Her ground and short game is extremely solid although again she struggles to overpower opponents in long rallies.

She won an NCAA endorsed tennis scholarship at Tulane University (a Division I varsity athletics program) where she represents the Green Wave tennis team as a rookie. The new season is about to begin.

**Personality:** In most aspects of her life Ellie is highly motivated and smart. She is popular both with her fellow students and her team. She is a real family girl and is missing her family who are based in Baton Rouge.

**Career championship wins:** 1 (G16 Louisiana State Champion 2011)

**Spends her time:**

- Studying
- Training and gym work
- Social media, reading, going out with friends (although is disciplined in terms of diet and lifestyle).

Figure G9. Ellie Raymond.



**Scenario**

You are a Sport Psychologist based within the Department of Psychology at Tulane University and consultant to the varsity teams. The head coach of Tulane Green Wave women's tennis team approaches you for advise about how to improve the mental aspects of Ellie Raymond's game. He has worked with her during pre-season and also talked to her previous coach based in Baton Rouge.

Whilst recognising her talent, he is concerned about her service game. He feels that her serve could be more powerful and that she lacks confidence rather than the skill to improve her serve. He also feels that she seems quite anxious at the moment. When questioning her further he feels that there are a couple of issues that seem to be affecting her.

Firstly, she is adjusting to life at university and is missing family despite forming positive relationships with other students. Secondly this is the first time that she has represented a team as opposed to herself and is worried about letting her team mates down in the upcoming game.

The coach asks you to meet her in person, but based on the information you have so far, what advise can you offer the coach?

**The Task**

- 1) Identify the problems in more detail
- 2) Suggest strategies that could help improve Ellie's service game
- 3) Suggest strategies that could help reduce her anxieties.

*Figure G10: Ellie Raymond (continued).*

# Abdullah bin Suleman



**Location:** Kuala Lumpur, Malaysia

**Role:** Professional footballer for Kuala Lumpur FA

**Major responsibilities:** First year professional breaking into team

**Demographics:**

- 18 years old
- Single

**Languages:** English, Bahasa Malaysia, Tamil

**Profile:** Abdullah bin Suleman. Is a first year professional playing in the Malaysian Premier League. He is a tenacious central midfielder with superb distribution skills. He has been selected to represent Malaysia at international U19 level on five occasions (scoring one goal).

The Malaysian U19 team are also represented as Harimau Muda C in the Malaysian FAM League (Third Tier). Abdullah has had a couple of excellent seasons which eventually caught the eye of newly promoted Kuala Lumpur FA who signed him on professional terms ahead of the new season.

In training he has shown excellent effort at Kuala Lumpur, however the Head Coach believes he is not developing quickly enough to be a first choice member of the squad. In particular his communication skills are underdeveloped and he is not yet gelling with other players in the squad. His coach also thinks that he is not yet adapting to life at a professional football team.

**Personality:** Abdullah is quiet but focussed. Communicating with others does not come easy to him.

**Notable performances:** Represented Malaysia in the 2013 AFF Youth Championship scoring 1 goal.

**Spends his time:** Listening to music. Following Islamic practices.

Figure G11. Abdullah bin Suleman.

**Scenario**

As team sport psychologist, you are asked to work closely with Abdullah bin Suleman to help develop his psychological skills. The Head Coach recognises the player's talent, but does not think his ready for first team football. In particular, he is unhappy with Abdullah's on-field communication, following of instructions and cohesion with other players. The coach reveals that he is so frustrated with the player that he has taken him to one side and shouted at him.

On your first consultation with the player you learn a number of things. Firstly, the player is feeling quite pressured in his new team. He feels that the coach and senior players are always critical of his performances in training, but he lacks the confidence to respond to them. Secondly, he is struggling to get used to a different style of play where he is no longer allowed to get forward, but is expected to sit in front of defence and break up play. Finally, he feels alone as the only Tamil in the squad (however, like many other members of the team he is a muslim).

**The Task**

- 1) Identify some the psychological issues that are manifesting in this scenario.
- 2) Write a mental training program that may help Abdullah
- 3) Make some recommendations to the coach as to how best to communicate with Abdullah and to integrate him into the team.

*Figure G12.* Abdullah bin Suleman (continued).

# Wang Jie



**Location:** Hangzhou, China

**Role:** Professional Golfer  
**Major responsibilities:** Moving up the rankings

**Demographics:**

- 27 years old.
- Married

**Languages:** Mandarin, English

**Profile:** As an up and coming golfer on the PGA Tour China, Wang Jie turned professional three years ago. Wei is educated as a qualified civil engineer and graduated from Zhejiang University of Science and Technology four years. During that period he was an impressive amateur golfer, qualifying for the Asia-Pacific Amateur championship in 2011 albeit not making the cut.

He gave up a lucrative engineering job three years to turn professional and is now in his third year on the PGA Tour China. After some excellent top ten finishes he now wants to push on with his career and move up the rankings.

He has a powerful, if sometimes wayward drive and an excellent short game around the green. His putting remains a weakness. His earnings on the PGA Tour China supports him and his family and he also has income from other investments.

**Personality:** Wang Jie is driven in every aspect of his life. He is a perfectionist and is hard on himself when he does not meet his high standards. However he is also a family man and enjoys spending time with his wife and you son.

**Notable performances:** Ranked 11 on on the PGA Tour China.

**Spends his time:** With family. Enjoys video games and Hollywood blockbusters.

Figure G13. Wang Jie.

### Scenario

Wang Jie has contacted you after reading your profile on LinkedIn and a further recommendation from an ASPASP colleague from China. You agree to meet with him over Skype.

Wang Jie is becoming increasingly frustrated with his erratic putting technique. Despite hours of practice and intensive work with his golfing coach he has been unable to make the improvements that he strives for. During the call he reveals to you that the problems are beginning to affect other aspects of his life. He is struggling to sleep and is becoming increasingly angry and depressed. He gives you an example in which he unfairly shouted at his young son and felt a sense of shame afterwards. You feel from all that he says that he is experiencing a number of issues with his everyday mood and wish to investigate further. He takes the BRUMs mood profiling test and you receive the following profile:

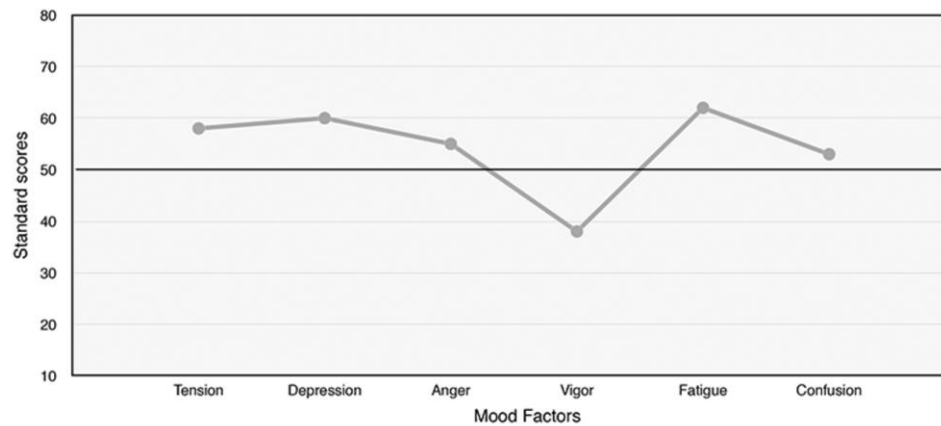


Figure G14. Wang Jie (continued).

Based on this information you are required to make some recommendations.

**The Task**

- 1) Reflect on the profile. What are the most pertinent issues?
- 2) Suggest some techniques that could improve the negative aspects of his mood.
- 3) Identify a psychological skills technique that could help him improve his putting.

*Figure G15. Wang Jie (continued).*

## Donna Katona & Kata Boros



**Location:** Budapest, Hungary

**Role:** Coxless pair international rowers. Donna (Bow), Kata (Stroke)

**Major responsibilities:** Building a new partnership ahead of international competition

**Demographics:**

- Both single. Both university graduates
- Donna (23 years old). Kata (28 years old)

**Languages:** Hungarian, English

**Profile:** Donna and Kata have recently come together as a new rowing partnership following the retirement of Kata's previous partner. They have been training ahead of the new season with their first regatta in four weeks time. Both rowers have excellent technique but are currently inexperienced as a pair.

**Personality:** Donna is confident and somewhat headstrong. Kata is quieter.

**Notable performances:** None as yet.

**Spends their time:** Donna enjoys spending time with friends. Kata enjoys her own space.

*Figure G16.* Donna Katona and Kata Baros.

### **Scenario**

The pair's coach is concerned that their training times are below standard so close to the start of the season and is considering switching their boat positions. Despite both rowers having excellent technique, communication between the two rowers is poor and in the coach's opinion this is having a huge effect on performance.

Kata as the more experienced partner in the team has taken on the role of steering the rowing boat despite not doing this in her previous partnership. The new responsibility coupled with a belief that she is expected to lead the partnership is causing a great deal of anxiety and she is uncomfortable with the coach's suggestion of swapping boat position.

Meanwhile, Donna is inwardly frustrated with the quality of communication between the partners, but is not prepared to say anything as she is worried about damaging the new relationship. She feels that despite her being the new member of the team, that she has the qualities to take on a leadership role and that this would improve things.

As a consultant to the Hungarian rowing team you have been alerted to the issue by the team manager. This is a delicate situation as the coach is quite traditional and expects her authority to be respected. Equally, you will need to understand the different needs of the athletes.

### **The Task**

- 1) Identify some of the group dynamic problems that are manifesting in this example
- 2) How would you go about explaining the problems to the coach
- 3) Suggest some techniques that could improve things for all involved.

*Figure G17.* Donna Katona and Kata Baros (continued).



Appendix H



Figure H1. Certificate of Completion issued to all learners who submitted a mental training program.

## Appendix I

**Ethical Clearance and Consent Forms for Usability Testing**

**OFFICE OF RESEARCH**  
 Human Research Ethics Committee  
 PHONE +61 7 4631 2690| FAX +61 7 4631 5555  
 EMAIL ethics@usq.edu.au



25 March 2015

Mr Neil Martin

Dear Neil

The USQ Human Research Ethics Committee has recently reviewed your responses to the conditions placed upon the ethical approval for the project outlined below. Your proposal is now deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* and full ethical approval has been granted.

Approval No.	<b>H15REA006</b>
Project Title	An evaluation of the development, design and impact of open licensed course materials on the teaching and learning of sport psychology: Usability testing study (Study 2)
Approval date	25 March 2015
Expiry date	25 March 2018
HREC Decision	<b>Approved</b>

The standard conditions of this approval are:

- (a) conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC
- (b) advise (email: ethics@usq.edu.au) immediately of any complaints or other issues in relation to the project which may warrant review of the ethical approval of the project
- (c) make submission for approval of amendments to the approved project before implementing such changes
- (d) provide a 'progress report' for every year of approval
- (e) provide a 'final report' when the project is complete
- (f) advise in writing if the project has been discontinued.

For (c) to (e) forms are available on the USQ ethics website:  
<http://www.usq.edu.au/research/ethicsbio/human>

Please note that failure to comply with the conditions of approval and the *National Statement (2007)* may result in withdrawal of approval for the project.

You may now commence your project. I wish you all the best for the conduct of the project.



**Annmaree Jackson**  
Ethics Coordinator

Copies to: [neil.martin@usq.edu.au](mailto:neil.martin@usq.edu.au)



University of Southern Queensland

## Consent Form for USQ Research Project Usability Testing Study

### Project Details

Title of Project: An evaluation of the development, design and impact of open licensed course materials on the teaching and learning of sport psychology: Usability testing study

Human Research Ethics Approval Number: HXXREAXXX

### Research Team Contact Details

#### Principal Investigator Details

Mr Neil Martin  
Email: neil.martin@usq.edu.au  
Telephone: (07) 4631 2342  
Mobile: 0448 828 878

#### Supervisor Details

Professor Peter Terry  
Email: peter.terry@usq.edu.au  
Telephone: (07) 4631 1681

### Statement of Consent

**By signing below, you are indicating that you:**

- Have read and understood the information document regarding this project.
- Have had any questions answered to your satisfaction.
- Understand that if you have any additional questions you can contact the research team.
- Understand that the usability testing will be screen captured and audio and video recorded.
- Understand that you will be provided with a copy of the recordings for your perusal and endorsement prior to inclusion of this data in the project, if you wish to request it.
- Understand that you are free to withdraw at any time, without comment or penalty.
- Understand that you can contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email [ethics@usq.edu.au](mailto:ethics@usq.edu.au) if you do have any concern or complaint about the ethical conduct of this project.
- Are over 18 years of age.
- Agree to participate in the project.

Participant Name

Participant Signature

Date

**Please return this sheet to a Research Team member prior to undertaking the interview.**

## Appendix J

**Concurrent Think Aloud Test (CTA)**

Below is a sample concurrent think aloud test (CTA) protocol that was given to five participants in the effort to identify any usability issues with *Elite Sport Performance: Psychological Perspectives* ahead of launch in October 2015.

Although CTA has some limitations, it has utility in uncovering issues because the tester is able to observe problems that people encounter as well as their emotional responses and frustrations. For the purpose of *Elite Sport Performance:*

*Psychological Perspectives* all testing was done on a Mac with Chrome browser and with QuickTime to record verbalisation and also capture screen activity e.g., where users click, move their mouse around the page, etc.

## Concurrent Think Aloud Usability Test 4

**Tools:** QuickTime screen recording on Mac.

**Time:** 30-45 mins

**Getting started:** Participant provided with a quick overview of the project and the purpose of a concurrent think-aloud test.

### Task 1: Registration

#### Homepage:

*Take a look at this homepage. Spend some time looking around, I will then ask you some questions. The purpose of this usability test is for you to provide me with your thoughts around the experience of using this website.*

- Find some information about the course. What is the purpose of this page?

#### Registration:

*Next you will register for the course:*

- Register for the course using this email address [usabilitytest01@mailinator.com](mailto:usabilitytest01@mailinator.com) and setting your own username and password
- Log into the course

### Task 2: Navigating the course and welcome screens

*Testing course navigation...*

- Start the course.
- Can you tell me what the course is about from the introduction?
- Is it clear to you how to navigate through the course?
- Click on another module. Can you get back to where you were?

### Task 3: Logging out and logging in

*Getting in an out of the course*

- Log out of the course and close the window.
- Now log back in the course.
- Navigate to where you were before.

**[Log out and log in as guest]**

### Task 4: Assessing a learning task

*Work your way through the music module offering your thoughts along the way (module changes for each participant)*

### Task 5: Upload a mental training program

*Read through the content at <http://www.elitesportpsy.org.au/lessons/mental-training/> and upload an example mental training program (saved on the desktop).*

## Appendix K

**Flyer Created to Promote Course**

Launches 15 October 2015

Register for free at:  
[elitesportpsy.org.au](http://elitesportpsy.org.au)



*Elite Sport Performance: Psychological Perspectives* is an open-licensed online course designed to introduce learners to the psychology of high performance sport.

Endorsed by the Asian-South Pacific Association of Sport Psychology (ASPASP), the course addresses the topics of motivation, anxiety, mood and emotion, self-confidence, concentration, imagery, music, and group dynamics.

*Elite Sport Performance: Psychological Perspectives* was developed by Professor Peter Terry PhD and doctoral candidate Mr Neil Martin from the University of Southern Queensland. It features expert insights from renowned sport psychologists, and an accompanying e-textbook, titled *Secrets of Asian Sport Psychology*.

The course is available from late October 2015. Learner participation and engagement will be evaluated as part of a PhD project.

*Figure K1.* Flyer distributed to promote *Elite Sport Performance: Psychological Perspectives*.



## Appendix L

**Measures**

The instruments and measures used during the evaluation of the second iteration of *Elite Sport: Performance: Psychological Perspectives* are provided in full below.

They include the demographic and intention questionnaire, the General Causality Orientation Scale (GCOS), the Basic Psychological Needs in Open Online Education Scale (BPNOOES), retrospective measures of engagement, and an investigation into reasons for not participating in the course

**Demographic and intention questionnaire: *About you - please complete before moving on*****What is your age?**

- 1) 18-24      2) 25-34      3) 35-44      4) 45-54      5) 55-64      6) 65+

**What is your gender?**

- 1) Male      2) Female

**What is the highest level of education that you have attained?**

- 1) Less than high school  
2) High school graduate  
3) Vocational or foundational qualification  
4) Undergraduate degree  
5) Postgraduate degree

**Which of these statements would you most agree with in relation to your reasons for enrolling on this course?**

- 1) I enrolled because the course is free and I wish to pursue my educational interests further.
- 2) I enrolled because I am passionate about sport and want to know more about its psychological side.
- 3) I enrolled because I want to understand how to improve my own sport performance.
- 4) I enrolled because I want psychological techniques to help improve the performance of athletes with whom I work.
- 5) I enrolled because I have an interest in psychology, but know little about sport psychology.
- 6) None of the above reasons apply to me.

**People have different intentions when they register for an open online course.**

**Which of the following statements best describes you?**

- 1) I am here to browse the materials, but not planning on completing any course activities.
- 2) I am planning on completing some course activities, but not planning on earning a certificate.
- 3) I am planning on completing enough course activities to earn a certificate.
- 4) I have not decided whether I will complete any course activities.





1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

- b) Ignore it because there's not much you can do about it anyway.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

- c) Tell him/her that you're willing to spend time together if and only if he/she makes more effort to control him/herself.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

**6. You have just received the results of a test you took, and you discovered that you did very poorly. Your initial reaction is likely to be:**

- a) "I can't do anything right," and feel sad.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

- b) "I wonder how it is I did so poorly," and feel disappointed.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

- c) "That stupid test doesn't show anything," and feel angry.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

**7. You have been invited to a large party where you know very few people. As you look forward to the evening, you would likely expect that:**

- a) You'll try to fit in with whatever is happening in order to have a good time and not look bad.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

- b) You'll find some people with whom you can relate.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

- c) You'll probably feel somewhat isolated and unnoticed.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |

**8. You are asked to plan a picnic for yourself and your fellow employees. Your style for approaching this project could most likely be characterized as:**

- a) Take charge: that is, you would make most of the major decisions yourself.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- b) Follow precedent: you're not really up to the task so you'd do it the way it's been done before.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- c) Seek participation: get inputs from others who want to make them before you make the final plans.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |

**9. Recently a position opened up at your place of work that could have meant a promotion for you. However, a person you work with was offered the job rather than you. In evaluating the situation, you're likely to think:**

- a) You didn't really expect the job; you frequently get passed over.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- b) The other person probably "did the right things" politically to get the job.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- c) You would probably take a look at factors in your own performance that led you to be passed over.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |

**10. You are embarking on a new career. The most important consideration is likely to be:**

- a) Whether you can do the work without getting in over your head.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- b) How interested you are in that kind of work.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- c) Whether there are good possibilities for advancement.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |

**11. A woman who works for you has generally done an adequate job. However, for the past two weeks her work has not been up to par and she appears to be less actively interested in her work. Your reaction is likely to be:**

- a) Tell her that her work is below what is expected and that she should start working harder.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- b) Ask her about the problem and let her know you are available to help work it out.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |
- c) It's hard to know what to do to get her straightened out.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |

**12. Your company has promoted you to a position in a city far from your present location. As you think about the move you would probably:**

- a) Feel interested in the new challenge and a little nervous at the same time.
- |               |   |   |                   |   |   |             |
|---------------|---|---|-------------------|---|---|-------------|
| 1             | 2 | 3 | 4                 | 5 | 6 | 7           |
| very unlikely |   |   | moderately likely |   |   | very likely |

b) Feel excited about the higher status and salary that is involved.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely

c) Feel stressed and anxious about the upcoming changes.

1                      2                      3                      4                      5                      6                      7  
 very unlikely                      moderately likely                      very likely



Name or Code: \_\_\_\_\_

Sex: M    F (circle one)

Date: \_\_\_\_\_

**Individual Styles Response Form - 12 Vignettes**

1.    a \_\_\_\_\_      2.    a \_\_\_\_\_      3.    a \_\_\_\_\_  
      b \_\_\_\_\_            b \_\_\_\_\_            b \_\_\_\_\_  
      c \_\_\_\_\_            c \_\_\_\_\_            c \_\_\_\_\_

4.    a \_\_\_\_\_      5.    a \_\_\_\_\_      6.    a \_\_\_\_\_  
      b \_\_\_\_\_            b \_\_\_\_\_            b \_\_\_\_\_  
      c \_\_\_\_\_            c \_\_\_\_\_            c \_\_\_\_\_

7.    a \_\_\_\_\_      8.    a \_\_\_\_\_      9.    a \_\_\_\_\_  
      b \_\_\_\_\_            b \_\_\_\_\_            b \_\_\_\_\_  
      c \_\_\_\_\_            c \_\_\_\_\_            c \_\_\_\_\_

10.    a \_\_\_\_\_      11.    a \_\_\_\_\_      12.    a \_\_\_\_\_  
       b \_\_\_\_\_            b \_\_\_\_\_            b \_\_\_\_\_  
       c \_\_\_\_\_            c \_\_\_\_\_            c \_\_\_\_\_

Name or Code: KEY

Sex: M    F (circle one)

Date: \_\_\_\_\_

**Individual Styles Response Form - 12 Vignettes**

- |     |   |          |     |   |          |     |   |          |
|-----|---|----------|-----|---|----------|-----|---|----------|
| 1.  | a | <u>I</u> | 2.  | a | <u>A</u> | 3.  | a | <u>C</u> |
|     | b | <u>C</u> |     | b | <u>I</u> |     | b | <u>I</u> |
|     | c | <u>A</u> |     | c | <u>C</u> |     | c | <u>A</u> |
| 4.  | a | <u>A</u> | 5.  | a | <u>A</u> | 6.  | a | <u>I</u> |
|     | b | <u>C</u> |     | b | <u>I</u> |     | b | <u>A</u> |
|     | c | <u>I</u> |     | c | <u>C</u> |     | c | <u>C</u> |
| 7.  | a | <u>C</u> | 8.  | a | <u>C</u> | 9.  | a | <u>I</u> |
|     | b | <u>A</u> |     | b | <u>I</u> |     | b | <u>C</u> |
|     | c | <u>I</u> |     | c | <u>A</u> |     | c | <u>A</u> |
| 10. | a | <u>I</u> | 11. | a | <u>C</u> | 12. | a | <u>A</u> |
|     | b | <u>A</u> |     | b | <u>A</u> |     | b | <u>C</u> |
|     | c | <u>C</u> |     | c | <u>I</u> |     | c | <u>I</u> |

**KEY:** A = Autonomy

C = Control

I = Impersonal

**The Basic Psychological Needs in Open Online Learning Scale (BPNOOES)**

**(adapted from the Basic Psychological Needs in Exercise Scale [BPNES; Vlachopoulos & Michailidou, 2006])**

**Questions (11 items)**

1. I feel I have made a lot of progress in relation to the goal I want to achieve.

[Competence]

2. Taking this open online course is in agreement with my choices and interests.

[Autonomy]

3. I feel I perform successfully the learning activities of this open online course.

[Competence]

4. My relationships with the people on this course is very friendly. [Relatedness]

5. I feel that the way I learn is the way I want to. [Autonomy]

6. I feel online learning is an activity, which I do very well. [Competence]

7. I feel I have excellent online communication with the people I learn with.

[Relatedness]

8. I feel that the way I learn is a true expression of who I am. [Autonomy]

9. I am able to meet the learning requirements of this course. [Competence]

10. My relationships with the people I learn with are close. [Relatedness]

11. I feel that I have the opportunity to make choices with regard to the way I learn in this course. [Autonomy]

**Scoring Scale**

I don't agree at all	I agree a little bit	I somewhat agree	I agree a lot	I completely agree
1	2	3	4	5

*Key:* Autonomy: items 2, 5, 8, 11; Competence: items 1, 3, 6, 9; Relatedness: items

4, 7, 10.

*Note.* The initial Relatedness 1 item in the original Greek questionnaire, "I feel comfortable with the people I exercise with," was removed from the translated BPNES version and therefore not adapted for this research.

**Retrospective Measures of Intrinsic Motivation and Engagement for course completers**

Your experience of participating in *Elite Sport Performance: Psychological Perspectives*. For each of the following statements, please indicate how true it is for you using the scale below.

1. I enjoyed doing this open online course very much.
2. I would describe this open online course as very interesting.
3. I am satisfied with my performance in this open online course.
4. After working on this open online course for a while, I felt pretty competent.
5. I put a lot of effort into this open online course.
6. It was important to me to do well in this open online course.
7. I was very relaxed in doing this open online course.
8. I felt pressured while doing this open online course.
9. I believe I had some choice about doing this open online course.
10. I did this open online course because I wanted to.
11. I believe this open online course could be of some value to me.
12. I believe doing this open online course could be beneficial to me.
13. I'd like a chance to interact with people more often in this open online course.
14. I feel close to other people in this open online course.

**Open-ended question**

Please tell us your thoughts about *Elite Sport Performance: Psychological Perspectives* in the box below. Your feedback will be useful in helping us develop the course further into the future.

**Scoring Scale**

1	2	3	4	5	6	7
Not at all true		Somewhat true			Very true	

**Items taken from the Intrinsic Motivation Inventory (IMI; Ryan 1982)****Measures**

- Interest and enjoyment (Q. 1 and 2).
- Perceived competence (Q. 3 and 4).
- Effort and importance (Q. 5 and 6).
- Pressure and tension (Q. 7 and 8).
- Perceived choice (Q. 9 and 10).
- Value and usefulness (Q. 11 and 12).
- Relatedness (Q. 13 and 14).

**Investigating Lack of Participation**

**1. Your reason for not participating in *Elite Sport Performance: Psychological Perspectives*. Which of these statements below most applies to you?**

- 1) I registered for the course but then forgot about it.
- 2) The course content did not interest me.
- 3) The course wasn't what I expected.
- 4) The course looked too challenging for me.
- 5) I wanted to participate further, but other priorities got in the way.
- 6) None of the above reasons explain my lack of participation.

**2. If you wish to elaborate on your answer above, then please use the comment box below.**



## Appendix M

**Ethical Clearance and Participant Information Sheet for Study 3**

**OFFICE OF RESEARCH**  
 Human Research Ethics Committee  
 PHONE +61 7 4631 2690| FAX +61 7 4631 5555  
 EMAIL [ethics@usq.edu.au](mailto:ethics@usq.edu.au)



25 March 2015

Mr Neil Martin

Dear Neil

The USQ Human Research Ethics Committee has recently reviewed your responses to the conditions placed upon the ethical approval for the project outlined below. Your proposal is now deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* and full ethical approval has been granted.

Approval No.	<b>H15REA007</b>
Project Title	An evaluation of the development, design and impact of open licensed course materials on teaching and learning of sport psychology: Self-determination and engagement study (Study 3)
Approval date	25 March 2015
Expiry date	25 March 2018
HREC Decision	<b>Approved</b>

The standard conditions of this approval are:

- (a) conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC
- (b) advise (email: [ethics@usq.edu.au](mailto:ethics@usq.edu.au)) immediately of any complaints or other issues in relation to the project which may warrant review of the ethical approval of the project
- (c) make submission for approval of amendments to the approved project before implementing such changes
- (d) provide a 'progress report' for every year of approval
- (e) provide a 'final report' when the project is complete
- (f) advise in writing if the project has been discontinued.

For (c) to (e) forms are available on the USQ ethics website:  
<http://www.usq.edu.au/research/ethicsbio/human>

Please note that failure to comply with the conditions of approval and the *National Statement (2007)* may result in withdrawal of approval for the project.

You may now commence your project. I wish you all the best for the conduct of the project.



**Annmaree Jackson**  
Ethics Coordinator

Copies to: [neil.martin@usq.edu.au](mailto:neil.martin@usq.edu.au)



University of Southern  
Queensland

## Participant Information for USQ Research Project Questionnaire

### Project Details

Title of Project: An evaluation of the development, design and impact of open licensed course materials on the teaching and learning of sport psychology: Self-determination and engagement study

Human Research Ethics Approval Number: HXXREAXXX

### Research Team Contact Details

#### Principal Investigator Details

Mr Neil Martin  
Email: neil.martin@usq.edu.au  
Telephone: (07) 4631 2342  
Mobile: 0448 828 872

#### Supervisor Details

Professor Peter Terry  
Email: peter.terry@usq.edu.au  
Telephone: (07) 4631 1681

### Description

This project is being undertaken as part of PhD program of research.

The purpose of this project is to identify relationships between the extent to which the design of an open online course meets the basic psychological needs

of the learner and also matches their motivational orientation. Additionally, engagement with the course in terms of undertaking learning activities will be measured.

The research team requests your assistance because we would like learners enrolled on the sport psychology course to complete a series of questionnaires to inform us about your sense of autonomy, competence and relatedness (basic psychological needs) and your motivational orientations. The measurement of your engagement with the course through completion of course activities and participation in course discussion will be automatically recorded through the course learning management system.

### Participation

Your participation will involve completion of two online questionnaires.

The first questionnaire will be presented at the start of the course and will take approximately 15 minutes of your time.

Questions will include for example:

"You have been offered a new position in a company where you have worked for some time. The first question that comes to mind is:

a) What if I can't live up to the new responsibility?

1	2	3	4	5	6	7
Very			moderately			very
Unlikely			likely			likely

b) Will I make more at this position?

1	2	3	4	5	6	7
Very			moderately			very

Unlikely                      likely                      likely

c) I wonder if the new work will be interesting.

1      2      3      4      5      6      7  
 Very                      moderately                      very  
 Unlikely                      likely                      likely

The second questionnaire will be presented in the first week of the course and repeated at the middle and towards the end of the course. This will take approximately 5 minutes of your time.

Questions will include for example:

1. I feel I have made a lot of progress in relation to the goal I want to achieve.
2. Taking this open online course is in agreement with my choices and interests.

I don't agree at all	I agree a little bit	I somewhat agree	I agree a lot	I completely agree
1	2	3	4	5

When you complete the questionnaires you will be asked for your course username. This will enable the researchers to match your questionnaire with your recorded progress in the course.

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage and have your data withdrawn from the study. If you do wish to withdraw from this project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland or your involvement in the open online course. You are not required to take part in this research in order to complete the online course.

### **Expected Benefits**

It is expected that this project will not directly benefit you, however, it may benefit future learners in enhancing our understanding of how to optimise the design of open online courses when the basic psychological needs of learners are considered as a key design principle.

As part of taking part in the research, you will be invited to enter a cash prize draw administered by the University of Southern Queensland School of Psychology & Counselling. The prize fund is one \$100 pre-paid visa card and two \$50 pre-paid visa cards. In order to enter this draw you will be asked to provide your email address. This will be stored separately from your questionnaire data.

### **Risks**

There are no anticipated risks beyond normal day-to-day living associated with your participation in this project.

### **Privacy and Confidentiality**

All comments and responses will be treated confidentially unless required by law.

The names of individual persons are not required in any of the responses. However, your course username will be required in order to match your responses to scores for activity and engagement that are collected by the learning management system. These will be treated confidentially.

Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy. The data will be analysed and written up as part of a PhD thesis and the anonymous data may be used in future research outputs such as academic journal articles.

### **Consent to Participate**

Clicking on the 'Submit' button at the conclusion of the questionnaire is accepted as an indication of your consent to participate in this project.

### **Questions or Further Information about the Project**

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

### **Concerns or Complaints Regarding the Conduct of the Project**

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email [ethics@usq.edu.au](mailto:ethics@usq.edu.au). The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

**Thank you for taking the time to help with this research project. Please keep this sheet for your information.**



# University of Southern Queensland

## USQ Human Research Ethics Committee

# Request for Amendment to an Approved Human Research Ethics Project

To complete this form

- Fill in check boxes for yes/no answers by double-clicking on the check box and selecting the "checked" option under the Default Value
- Fill in text frames by typing your answers in the space provided. The frame will expand to accommodate the text

Please email an *electronic copy* of this amendment to [ethics@usq.edu.au](mailto:ethics@usq.edu.au)

### Investigator Details

Principal Investigator Name <i>(on approved ethics application)</i>	Neil Martin
Email Address	<a href="mailto:Neil.martin@usq.edu.au">Neil.martin@usq.edu.au</a>
School, Faculty, or Research Centre	School of Psychology and Counselling
Purpose of Research	<input type="checkbox"/> USQ Staff Member <input checked="" type="checkbox"/> USQ Student

### For student research projects only:

Student Supervisor	Name	Professor Peter Terry
	Email Address	<a href="mailto:peter.terry@usq.edu.au">peter.terry@usq.edu.au</a>



<b>Project Details</b>	
------------------------	--

Ethics Approval No.	H15REA007
Name of Project	An evaluation of the development, design and impact of open licence course materials on teaching and learning of sport psychology: Self-determination and engagement study (Study 3)

Please provide a brief summary of the approved project, including a brief statement of the main objective of the project and the methodologies (*obtained from the approved ethics application*)

[Taken from approved ethics application]

This study supports the development of a design framework that applies principles articulated in self-determination theory (Ryan & Deci, 2000) to redesign and evaluate of an open online course in sport psychology. Self-determination theory (SDT) is a psychological theory of human motivation, behaviour and well-being and has been applied across a number of domains including education, elite sport, and organisational studies. The course redesign will address the three basic psychological needs of SDT: autonomy, competence and relatedness, with a view to optimising learning outcomes. The course will run in June and July 2015, will be exclusively online and will be open to the general public.

The study is an evaluation of a newly redesigned open online course that integrates SDT with best practice from user-centred design and e-learning design. Volunteer course participants drawn from a cohort of learners who have enrolled for the open online course will be surveyed online for self-determination scores and course engagement. It is hypothesised that: a) In the context of an open online course, measured levels of engagement with learning activities will be highest in autonomy-oriented learners; b) Scores for perceived self-determination (autonomy, competence and relatedness) will significantly increase over the duration of the course, and; c) A positive relationship will be found between perceived levels of self-determination and overall course engagement

The course will be hosted online as an instance of WordPress hosted by Dreamhost.com. Dreamhost is a world-leading web hosting service that hosts over 1.5 million websites. A specific plugin called Learndash will be used to facilitate the learning environment. Learndash has a range of features to structure the course, handle enrolments and support the learner. More details are available at <http://www.learndash.com/learndash-lms-features/>

The Asian-South Pacific Association of Sport Psychology (ASPASP) will endorse the course. An iteration of the course ran in late 2013 and was also endorsed by ASPASP. Further information of that iteration can be viewed at <https://wikieducator.org/OERuESP1>

The researcher will be seeking a course facilitator to act as a point of contact between the students and the course. The role will involve answering questions, weaving discussion and providing course information. The previous iteration of the course had a volunteer drawn from USQ's Open Access College, and it is anticipated that from here the course facilitator will come.

The outcomes of this research will provide supporting evidence of best practice in the development and design of open online courses.

#### Requested Amendments

**1. Would you like to submit a request of an extension of time on the data collection phase of the research?**

Yes  No

If Yes:

- what is the requested new project expiry date?

**2. Does the amendment involve a change to protocols and/or methodology?**

Yes  No

If Yes:

- Please provide details in the box below.

As an extension to the study, we wish to find out some more information to further the course evaluation. An outcome of the study following a run of the course indicates that two cohorts of participants have emerged. First, those who did not engage at all and second, those who deeply engaged over a period of time. We are interested in the reasons behind this phenomenon and would like to send a short survey to each group via the emailing of a link to a Qualtrics survey to the email account used when registering for the course.

There will be two separate surveys. One will be sent to the deep engagers to find out more information about their subjective experience of taking the course, with a particular focus on dimensions of intrinsic motivation. The second survey will be sent to the non-engagers to find out why they did not engage with the course. The first survey contains 14 items from the intrinsic motivation inventory, plus one open-ended question. The second survey to the non-engagers comprises a single question and an optional elaboration box. Please see attached file *measures* for more details.

**3. Does the amendment involve a change to participant subject groups?**

Yes  No

If Yes:

- Please provide details in the box below.

**4. Does the amendment involve changes to Participant Information Sheet, Consent forms, or letters of invitation?**

Yes  No

If Yes:

- Please provide modified versions of the relevant documents using "tracked changes" to highlight where the document differs from that originally approved.

Please find email to participants attached.

**5. Does the amendment involve changes to data collection instruments, such as questionnaires, interview or focus group questions?**

Yes  No

If Yes:

- Please provide modified versions of the relevant documents using "tracked changes" to highlight where the document differs from that originally approved.

Please find surveys attached.

**6. Does the amendment involve a change of investigators on the research team?**

Yes  No

If Yes:

- Please provide details in the box below

**Investigators joining the project:**

<b>Staff/ student ID</b> <i>(10 digits)</i>	<b>Name</b>	<b>Email</b>	<b>Contact number</b>

**Investigators leaving the project:**

<b>Staff/ student ID</b> <i>(10 digits)</i>	<b>Name</b>	<b>Email</b>	<b>Contact number</b>


**7. Please summarise any other amendment(s) to the approved project**

--

**Declarations**

**Principal Investigator**

*I confirm that the information included in this report is accurate.*

<b>Name (please print)</b>	<b>Signature</b>	<b>Date</b>
Neil Martin		9 <sup>th</sup> March 2016

**Investigators Joining the Project**

*I confirm that I:*

- *am joining this project, and*
- *will abide by the University's Research Code of Conduct and all pursuant policies and procedures.*

Name (please print)	Signature	Date

**Investigators Leaving the Project**

*I confirm that I am leaving this project.*

Name (please print)	Signature	Date

**Email Sent to Engagers**

Dear participant of *Elite Sport Performance: Psychological Perspectives*,

Thank you for taking part in *Elite Sport Performance: Psychological Perspectives*,

We are interested in both the quality of your experience and your overall feedback. Therefore we would appreciate it if you would take a few minutes to answer a short survey.

If you would like to take part in this additional evaluation, please click on the link below.

[Link to Survey]

With best wishes

Peter Terry and Neil Martin

**Email Sent to Non-Engagers**

Dear participant of *Elite Sport Performance: Psychological Perspectives*,

Thank you for your initial interest in the course.

We have identified you as somebody who did not fully engage with the course and we are interested as to the reasons why.

Therefore, we would appreciate it if you would take a moment to answer a single question, which will help us to better understand how to respond to the reasons why people choose not to take part in open online courses.

If you would like to take part in this additional evaluation, please click on the link below.

[Link to Survey]

With best wishes

Peter Terry and Neil Martin



University of Southern  
Queensland

## Participant Information for USQ Research Project Questionnaire

### Project Details

Title of Project: An evaluation of the development, design and impact of open licensed course materials on the teaching and learning of sport psychology: Self-determination and engagement study

Human Research Ethics Approval Number: H15REA007

### Research Team Contact Details

#### Principal Investigator Details

Mr Neil Martin  
Email: neil.martin@usq.edu.au  
Telephone: (07) 4631 2342  
Mobile: 0448 828 872

#### Supervisor Details

Professor Peter Terry  
Email: peter.terry@usq.edu.au  
Telephone: (07) 4631 1681

### Description

Following on from your registration for the Open Online Course *Elite Sport Performance: Psychological Perspectives*, we would like to better understand your experience of participating in the course.

We would therefore like you to answer a short questionnaire that focuses on your experiences of taking part in the course such as your levels of interest, engagement, and perceived competence.



**Participation**

Your participation will involve completion of a short questionnaire of 14 items and take you no longer than a few minutes.

The questionnaire will concern your perceptions of the course and more specifically, how they relate to you.

Example questions include:

**Your experience of participating in *Elite Sport Performance: Psychological Perspectives*.**

For each of the following statements, please indicate how true it is for you, using the following scale:

not at all true			somewhat true			very true
1	2	3	4	5	6	7

- 1) I enjoyed doing this open online course very much.
- 2) I would describe this open online course as very interesting.
- 3) I am satisfied with my performance in this open online course.

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage and have your data withdrawn from the study. If you do wish to withdraw from this project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland or your involvement in the open online course. You are not required to take part in this research in order to complete the online course.

### **Expected Benefits**

It is expected that this project will not directly benefit you, however, it may benefit future learners in enhancing our understanding of how to optimise the design of open online courses.

### **Risks**

There are no anticipated risks beyond normal day-to-day living associated with your participation in this project.

### **Privacy and Confidentiality**

All comments and responses will be treated confidentially unless required by law.

Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy. The data will be analysed and written up as part of a PhD thesis and the anonymous data may be used in future research outputs such as academic journal articles.

### **Consent to Participate**

Clicking on the 'Submit' button at the conclusion of the questionnaire is accepted as an indication of your consent to participate in this project.

#### **Questions or Further Information about the Project**

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

#### **Concerns or Complaints Regarding the Conduct of the Project**

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email [ethics@usq.edu.au](mailto:ethics@usq.edu.au). The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

**Thank you for taking the time to help with this research project. Please keep this sheet for your information.**



University of Southern  
Queensland

## Participant Information for USQ Research Project Questionnaire

### Project Details

Title of Project: An evaluation of the development, design and impact of open licensed course materials on the teaching and learning of sport psychology: Self-determination and engagement study

Human Research Ethics Approval Number: H15REA007

### Research Team Contact Details

#### Principal Investigator Details

Mr Neil Martin  
Email: [neil.martin@usq.edu.au](mailto:neil.martin@usq.edu.au)  
Telephone: (07) 4631 2342  
Mobile: 0448 828 872

#### Supervisor Details

Professor Peter Terry  
Email: [peter.terry@usq.edu.au](mailto:peter.terry@usq.edu.au)  
Telephone: (07) 4631 1681

### Description

Following on from your registration for the Open Online Course *Elite Sport Performance: Psychological Perspectives*, we would like to understand the reasons why you were unable to engage with the course.

We would therefore like you to answer one survey question and if you wish expand upon your answer as an open-ended response.

**Participation**

Your participation will involve answering one question.

The question will concern your reasons why you were unable to engage with the course.

Your participation in this project is entirely voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage and have your data withdrawn from the study. If you do wish to withdraw from this project, please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or to take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland or your involvement in the open online course. You are not required to take part in this research in order to complete the online course.

**Expected Benefits**

It is expected that this project will not directly benefit you, however, it may benefit future learners in enhancing our understanding of how to optimise the design of open online courses.

**Risks**

There are no anticipated risks beyond normal day-to-day living associated with your participation in this project.

**Privacy and Confidentiality**

All comments and responses will be treated confidentially unless required by law.

Any data collected as a part of this project will be stored securely as per University of Southern Queensland's Research Data Management policy. The data will be analysed and written up as part of a PhD thesis and the anonymous data may be used in future research outputs such as academic journal articles.

**Consent to Participate**

Clicking on the 'Submit' button at the conclusion of the questionnaire is accepted as an indication of your consent to participate in this project.

**Questions or Further Information about the Project**

Please refer to the Research Team Contact Details at the top of the form to have any questions answered or to request further information about this project.

**Concerns or Complaints Regarding the Conduct of the Project**

If you have any concerns or complaints about the ethical conduct of the project you may contact the University of Southern Queensland Ethics Coordinator on (07) 4631 2690 or email [ethics@usq.edu.au](mailto:ethics@usq.edu.au). The Ethics Coordinator is not connected with the research project and can facilitate a resolution to your concern in an unbiased manner.

**Thank you for taking the time to help with this research project. Please keep this sheet for your information.**

## Approval for Post-Course Data Collection

Ethics

15 March 2016 at 14:49

To: Neil Martin Cc: Peter Terry

USQ HREC H15REA007 Human Research Ethics Amendment Request #2 - Approved

E

Dear Neil

**Re: H15REA007 "An evaluation of the development, design and impact of open licence course materials on teaching and learning o sport psychnology: Self-determination and engagement study (Study 3)"**

The Human Research Ethics Committee has recently reviewed your application for amendment to your ethics approval for the above project.

The requested amendments have been approved, **effective from 15 March 2016**. I confirm that your project expiry date is 25 March 2018.

The standard conditions of this approval are:

- (a) conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC
- (b) advise (email: [ethics@usq.edu.au](mailto:ethics@usq.edu.au)) immediately of any complaints or other issues in relation to the project which may warrant review of the ethical approval of the project
- (c) make submission for approval of amendments to the approved project before implementing such changes
- (d) provide a 'progress report' for every year of approval
- (e) provide a 'final report' when the project is complete
- (f) advise in writing if the project has been discontinued.

For (c) to (e) proformas are available on the USQ ethics website: <http://www.usq.edu.au/research/support-development/research-services/research-integrity-ethics/human/forms>

Please note that failure to comply with the conditions of approval and the *National Statement on Ethical Conduct in Human Research (2007)* may result in withdrawal of approval for the project.

You may now implement the amendments. I wish you all the best for the conduct of the project.

If you have any questions or concerns, please do not hesitate to contact the [Ethics Office](#).

Kindest regards,

Sam

**Samantha Davis**

**Ethics Officer**

Office of Research | University of Southern Queensland

Toowoomba | Queensland | 4350 | Australia

Ph: +61 7 4687 5703 | Fax: +61 7 4631 1995 | Email: [ethics@usq.edu.au](mailto:ethics@usq.edu.au)

## Appendix N

## Course Communication Examples

The screenshot shows the LearnDash ProPanel dashboard for the course "Elite Sport Performance: Psychological Perspectives". The interface includes a sidebar with navigation options like Home, Updates, Posts, Media, and Courses. The main content area displays course statistics and a communication form.

**Course Statistics:**

- Total Courses: 1
- Total Students: 1090
- Most Popular Courses: **Elite Sport Performance: Psychological Perspectives**

**Course Reports:**

Send message to all *Elite Sport Performance: Psychological Perspectives* users

Subject:

Message:

**Course Progress:**

- Not Started: 31%
- In Progress: 40%
- Complete: 28%

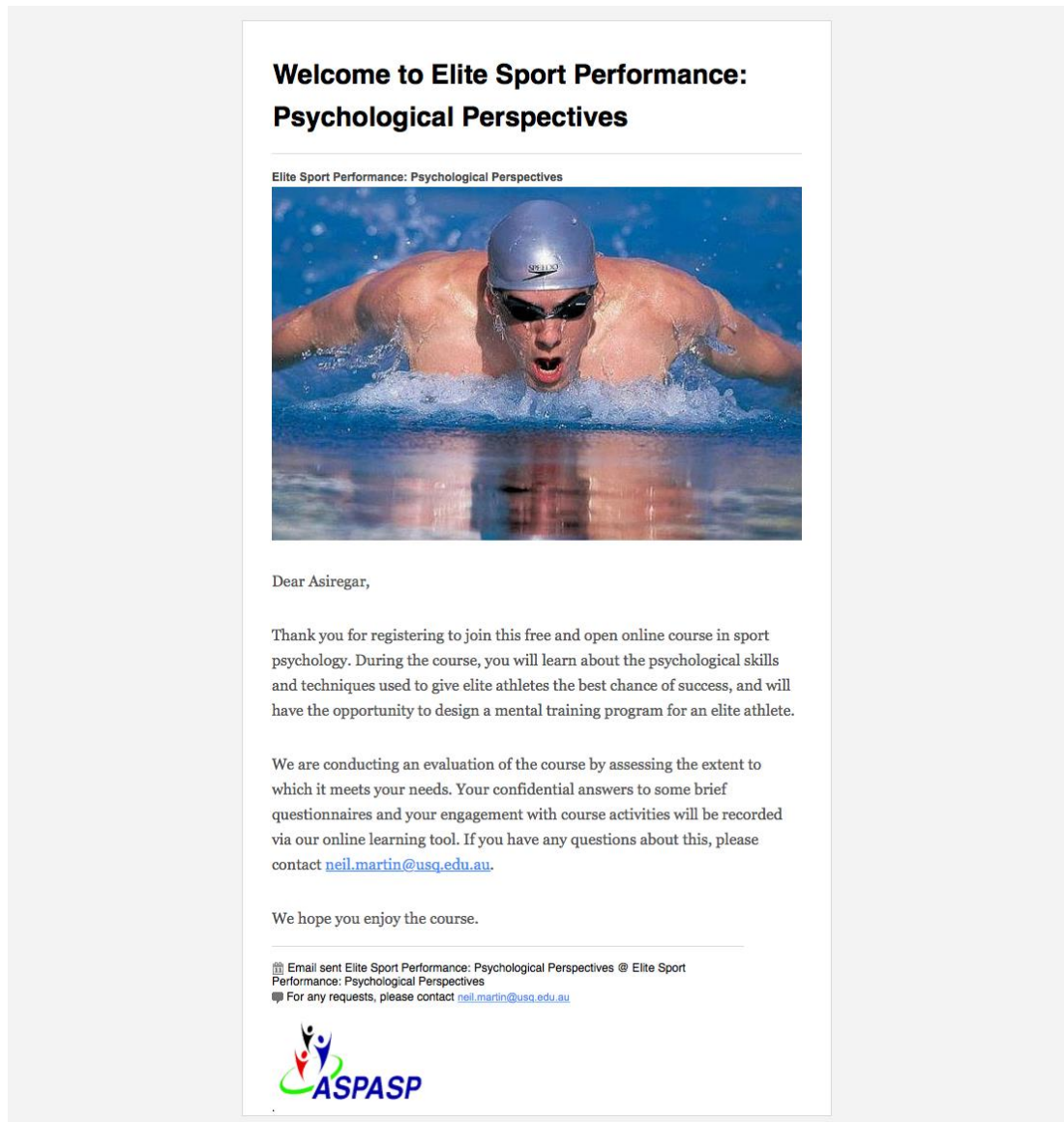
**Export User Information:**

Filter: All  Search

S. No.	Username	Email	Progress	Edit Profile
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*Figure N1.* Screenshot of LearnDash ProPanel. The interface provides information about course activity as well as a mechanism for communicating with all learners.





*Figure N2.* Welcome email automatically sent to learners on enrolling on course.

**Elite Sport Performance: Psychological Perspectives Update**




Image credit: XINHUA/SYGOC-Pool/Meng Yong (CC BY 2.0).

Hello To All Participants of Elite Sport Performance: Psychological Perspectives

This is just a gentle reminder that there are only 4 days remaining to complete the course and download your certificate of achievement.


Merit awards for this period go to zorantennis, amenrigh, Yorgos, an2489, s.giltingi, and Anna Hemmings for posting their insights on the discussion forum. If you want to understand some of the ways in which elite athletes use imagery then read Anna's posting at <http://www.elitesportpsy.org.au/forums/topic/your-imagery-experiences/page/4/>

We've had a surge in the number of mental training programs being

Figure N3. Example course update sent to learners.

you used token x


[www.elitesportpsy.org.au/forums/topic/have-you-used-token-rewards/page/2/](http://www.elitesportpsy.org.au/forums/topic/have-you-used-token-rewards/page/2/)



I've used token rewards with youth athletes, however I am not in a coaching position with my collegiate athletes, therefore I can make suggestions to the coaching staff in that environment-leaving it up to them to implement. When doing it with my youth league, it really fostered positive peer pressure and a culture of trying to do better on a weekly basis.

Participant

December 4, 2015 at 1:29 pm REPLY #15473



Have you used token rewards? Were they effective? Would you use them again?

Yes, I have used them on my Taekwondo kids who behave well in class or who had learnt a particular kick or movement. I think that my kids love them, especially if the tokens are Taekwondo related; such as Taekwondo keychains etc. I will definitely used them again and again but the tokens have to be something new, maybe a taekwondo t-shirt.

Participant

Figure N4. Example forum post from course participant.

Appendix O



Figure O1. Behaviour flow through Elite Sport Performance: Psychological Perspectives.