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Abstract

In the context of contemporary coaching, it is necessary to explore approaches that cater to the needs and preferences of modern learners. Given the emergence of online/remote coaching and coach development (ORC/CD) in recent years, this could involve the exploration of frameworks and onto-epistemologies that better ensure alignment with contemporary understandings of learning in the digital era. In the current article, we take the opportunity to explore some of the possible theoretical considerations that can inform future research in this emerging area; and thus support the application of technology-enhanced coaching/learning in sport coaching contexts. First, we philosophically position our arguments within a ‘new culture of learning’ (NCOL) – a framework that is congruent with online learning experiences. From there, we consider Connectivism – as an expression of New Materialism – as a suitable onto-epistemology to guide future research given its recognition of networked ways of being in the twenty-first century. We conclude by suggesting heutagogy (self-determined learning) as an appropriate signature ‘~gogy’ for ORC/CD environments.

Keywords

Connectivism, heutagogy, new materialism, pedagogy, technology-enhanced learning

Introduction

By now, the reader will be familiar with the sentiment that the global pandemic significantly disrupted coaching practices worldwide. The limited ability to conduct face-to-face interactions resulted in a surge of online/remote coaching and coach development (ORC/CD) approaches, while coaches and athletes turned to digital platforms and communication technologies to bridge the physical gap and ensure the continuity of coaching engagements.^{1,2} Although research in online/remote coaching^{3,4} and online/remote coach development^{5–7} was already underway, the recent global pandemic has proven to be a significant catalyst in prompting an openness to new conditions and locations for coaching and coach development to occur.^a

With this as a backdrop, educators have increasingly faced two competing demands in recent years. On the one hand, learners state that they would prefer not to engage with online education, and instead meet face-to-face with their learning group (i.e. fellow learners and the instructor). The oft-given rationale is that the informal interactions that take place before, during, and after a formal session are

valued elements of the overall learning experience.⁸ Contrarily, learners are simultaneously requesting more frequent use of technology-enhanced learning (TEL) tools and strategies to facilitate their educational encounters, citing preferences to learn in spaces and at times that offer enhanced flexibility.⁹ With the ubiquity of and exponential advancements in technology and telecommunication systems, scholars in the field of online and distance education^{8,10} note an increased ability and willingness – by educators and learning institutions – to explore ways in which to cater for these competing demands. Unsurprisingly, a similar enthusiasm may be noted in sports coaching

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contexts as research on the use of technology as a means to provide quality and cost-effective sporting experiences has begun to emerge.^{3,4,11} As yet, however, this area of scholarship is still in an early stage of development.

Conditions and locations for ORC/CD

As the emerging body of research suggests,^{2,12} the application of remote/online coaching methods presents various benefits to the field. Online learning offers flexibility in terms of location and time for both coaches and athletes, permitting coaches/coach developers to work with learners regardless of their geographical location.^{3,11} With this, the possibilities for more extensive engagement from learners located in remote areas and/or who have limited access to in-person learning opportunities can be achieved through the application of TEL tools and strategies.¹³ Likewise, the use of online platforms and/or digital tools can enable customised coaching/learning experiences to meet individual learner needs and offer real-time feedback.¹⁴ The same TEL approaches are useful in connecting learner groups when financial barriers to face-to-face interactions exist.^{3,4}

However, learning in online and remote contexts comes with challenges. Technological barriers and disparities in access to digital resources can limit the inclusivity and effectiveness of coaching interventions.¹⁵ Coaches and athletes must navigate various digital platforms, ensuring they have the necessary technological infrastructure and skills to participate fully – indeed, the ‘digital divide’ is an important consideration for ORC/CD researchers and practitioners. Additionally, the absence of in-person, social interactions and non-verbal cues, means that coaches and coach developers need to develop robust, alternative strategies to interpret and respond to learners’ needs.³

We also recognise the opportunities and implications of remote and online coaching for disabled athletes. On the one hand, online coaching may provide an opportunity for greater inclusion and accessibility, potentially allowing better access for disabled athletes to participate in coaching programs. On the other hand, it is essential to recognize that not all digital platforms and tools may be fully accessible or inclusive for all disabilities, requiring careful consideration and collaboration with disabled athletes to ensure their needs are met. Certainly, this is an important area for ongoing research – particularly as there is limited exploration of the topic to date.

Possible applications of ORC/CD

Mindful of the specific requirements and nature of each sport or learning context, ORC/CD has a wide range of applications across various sports and coaching environments. Individual sports like running, cycling, swimming, golf, gymnastics, and martial arts lend themselves to ORC, allowing for personalised training

programs, technique analysis, and performance feedback.¹⁶ Fitness and conditioning coaching, including strength training and endurance exercises, can be effectively conducted online through customised workout plans and virtual training sessions, with the added possibility of real-time feedback.¹¹ Tactical analysis and strategy development in team sports such as football, basketball, hockey, and rugby can benefit from online platforms for reviewing match footage, analysing player performances, and conducting virtual team meetings.¹⁷ Online environments also provide valuable opportunities for mental skills training, including visualisation exercises, goal setting, and psychological strategies to enhance performance.^{18,19}

Online environments also offer a suitable location for building and maintaining connections in coach development.^{5,20} Coaches can access online courses, webinars, and interactive modules to expand their understanding of coaching principles, techniques, and methodologies. Similarly, online communities and forums can facilitate knowledge sharing, collaboration, and mentorship among peers cross-culturally.¹ In the near future, we may even see more virtual coaching demonstrations and simulations that allow coaches to observe and learn from experienced professionals (see also Murray et al.¹⁴). While physical and social interactions manifest differently in online settings, we are optimistic that (more) longitudinal research will demonstrate the ways in which coaches and coach developers can interact effectively with digital resources/platforms to promote diverse approaches and further our current pedagogical understanding of ORC/CD.

Theoretical foundations and pedagogical approaches for ORC/CD

In recent years, scholars have argued that education in the digital age necessitates a shift in how we think about learners’ engagement with their environments.^{21,22} Advances in TEL tools, from various devices to Web 2.0/Web 3.0 technologies, offer learners easier access to a plethora of digital platforms, facilitating engagement with a diverse range of information, opinions, and knowledge.²³ With this in mind, then, we recognise the importance of considering robust theoretical foundations and nuanced pedagogical approaches to ensure effective online learning experiences. In essence, we contend that modifications to the art of coaching are essential if ORC/CD environments are to remain commensurate with; 1) transformations in technology, and 2) the expectations and needs of learners. Indeed, Hew and Cheung²⁴ have highlighted that technology, itself, is not the ‘silver bullet’ for enhanced learning or performance. Rather, as Cushion and Townsend¹⁵ suggest, a grounding in sound learning theory is requisite

if the field is to advance. It is this call that has prompted the current article.

The remainder of this article has three specific intentions. First, we seek to philosophically position ORC/CD within a *new culture of learning* (NCOL).²¹ Our objective is to locate this emerging field of scholarship and praxis within a perspective of learning that is commensurate with the digital age. Second, we attempt to position Connectivism – (re)conceptualised within a Deluzian notion of New Materialism – as a suitable onto-epistemological stance from which to conduct future research. Our rationale highlights the emphasis Connectivism places on the use of technology to build, navigate, and transform networks, and therefore, to learn effectively as a part of a complexly networked world.^{25,26} Third, we attempt to make the case that a broader view of the ‘~gogies’ provides a useful way to reflect on the appropriate instructional styles available when operating in ORC/CD contexts. In this sense, we attempt to position heutagogy (or self-determined learning) as a suitable signature ‘~gogy’.²⁷

Given the scope of our intentions, this article is not able to offer a significant level of depth of discussion. Instead, and acknowledging that there are a range of possible theories to draw on, we have set out to present our ideas primarily to prompt or stimulate critical debate and future research that examines the merit of our suggestions.

A philosophical positioning for ORC/CD

In a similar transition from oral traditions of knowledge exchange to written cultures, and from written text to a press-based culture, it is amidst a digital revolution that contemporary learning environments differ radically from the traditionally favoured, explicit exchanges of knowledge from ‘expert’ to learner.²¹ As Glassner and Back²³ suggest, there are a multitude of ways in which people can access and engage with information—for instance, through various social networks, search engines, Artificial Intelligence (AI) platforms, collaborative websites, information communication tools (ICT) (e.g. Zoom, Teams, Skype, WhatsApps, Messenger), and virtual reality programmes. Indeed, the ubiquity of and accessibility to this technology (for many), suggests that a perspective which captures a *new culture of learning* (NCOL) is required to harness the potential of these TEL tools and strategies. As we argue below, this is particularly true for the evolving field of ORC/CD. The following section offers an overview of the underpinning concepts of Thomas and Seely Brown’s²¹ NCOL as a conceptual framework within which to locate our subsequent suggestions for the field.^b

A rationale for NCOL

In its broadest sense, NCOL challenges traditional educational approaches and advocates for a paradigm shift that

aligns with the needs and expectations of contemporary learners in the digital age. As Thomas and Seely Brown²¹ suggest:

For most of the twentieth century, an educational system has been built on the assumption that teaching is necessary for learning to occur. Accordingly, education has been seen as the process of transferring information from a higher authority (the teacher) down to the student. This model, however, just can’t keep up with the rapid rate of change in the twenty-first century. It’s time to shift our thinking from the old model of teaching to a new model of learning.²¹, p. 34

Thomas and Seely Brown²¹ maintain that our current levels of access to both information and other individuals are unprecedented in contemporary history. Beyond our connections to almost unlimited resources, we are also connected to people who can assist, manage, organise, disseminate, and make sense of those resources. Importantly, such connections allow learners to foster highly valued peer-to-peer mentorship within the collective learning environment, and learning is thus characterised by significantly more diverse perspectives. In this way, the NCOL perspective points to the importance of refocusing emphasis from *coaching*, to one of *learning*. Concurrently, this results in a shift away from the transmission of *content*, in recognition of the multitude of *contexts* a contemporary learner can use to make meaning from.²⁸

Alignment with constructivist notions found in sport coaching scholarship may be noted here – that is, the thesis advocating for the ‘expert’ coach/coach developer to (re)position him/herself as a *facilitator* in the learning process. In this context, the facilitator provides guidance where it is required, but is otherwise willing to allow and encourage the learner (i.e. athlete/coach) to seek out and construct alternative or novel understandings of their craft.^{29–32} As such, our proposition to philosophically ground ORC/CD within the NCOL perspective is perhaps best seen as an extension of current scholarship, albeit in a way that is nuanced by an appreciation for the digital, networked, and diverse contexts within which contemporary learners reside and operate.

NCOL and its relevance to ORC/CD

For Thomas and Seely Brown, learning is not confined to the classroom (or training environment, in our case). Rather, learning occurs in various facets of daily life and is driven by passion and curiosity. Within this context, traditional education approaches often fail to foster learners’ passions, and instead, emphasise mechanistic knowledge transfer.^{21,32} In essence, then, NCOL is based on the premise that the current climate of rapid change may mean that many educational approaches are insufficient.

Educators should therefore consider how to develop contemporary learners' *playfulness*, *imagination*, and *ability to question* – the bedrocks of learning in a digital world of information 'in flux'.

Adopting the NCOL perspective encourages educators to consider how to create environments that mirror learners' digital habits and personal interests.²¹ On the basis of this, NCOL is presented as a promising philosophical perspective to drive learning in the digital age – in turn, prompting us to consider the possibilities of employing NCOL as a philosophical framework to underpin ORC/CD contexts. Below, we briefly review the core assumptions made by Thomas and Seely Brown and consider these in light of ORC/CD.

Boundaries and navigating the digital landscape. As Hess et al.³³ suggest, access to information does not guarantee access to wisdom – particularly when a learner engages in haphazard exploration of vast online knowledge networks. Rather, as Thomas and Seely Brown²¹ emphasise, it is important to consider the role of structured environments and defined frameworks within the digital landscape to support a learner's exploration. In an online/remote tennis coaching environment, for example, a learner aiming to enhance their serving technique could be encouraged to focus their exploration on the search term 'spin serve techniques'. Learners could be provided with select video breakdowns (i.e. from YouTube) and relevant articles, but confined (for the time being) to investigating and discussing this specific skill. Online, collaborative analysis of the learner's uploaded videos of a spin serve execution could be further supported by coaches offering new and challenging scenarios to prompt nuanced thought about timing, positioning, and decision-making in game situations. In essence, Thomas and Seely Brown's suggestion relates to the importance of the coach limiting the informational 'noise' in digital spaces. The imposed boundary – that is, limiting the search terms a learner might use – acts as a catalyst for targeted exploration, fostering a richer learning experience in the digital space, and encouraging the development of nuanced questions and innovative solutions within set parameters.²¹

Playfulness. The NCOL perspective recognizes the foundational role of play, imagination, and questioning in the learning process across all stages of life. Play, in particular, allows learners to experiment, discover, and engage with their surroundings.³⁴ For Thomas and Seely Brown, playfulness serves as a powerful instrument for inquiry and experimentation, whereby nonlinear approaches to problem-solving are encouraged. This, they suggest, is particularly valuable in a constantly changing world.²¹ By way of example, a coach developer might implement a role-playing exercise that exposes coaches (as learners) to various leadership styles, requiring them to approach the

gap between what is known, and where they aspire to be, from multiple perspectives. Likewise, a coach operating online or remotely may employ various pedagogical strategies that align with the principles of play and imagination (see below), such as role-playing scenarios, decision-making exercises, and collaborative problem-solving tasks. Encouraging and embracing an explorative, playful mindset can enable learners to reach epiphanies while drawing on tacit understandings, thus engaging them in meaningful ways.³⁵ And, as learners actively participate within a structured framework, characterised by playfulness and imagination, the potential for increased motivation, critical thinking, and creativity may be nurtured.²¹

Imagination. As suggested earlier, the presence of boundaries acts as a catalyst for imagination and creativity. Therefore, establishing structured online environments can lead to the exploration of alternative perspectives and the discovery of innovative problem-solving approaches through imaginative thinking. In coach education contexts, traditional queries such as: 'what aspects of XYZ leadership theory are evident here?' can be replaced with more dynamic questions like: 'in this context, what leadership style would be best?' The shift from asking what is already known, to exploring the *unknown*, can empower coaches to tap into their tacit understandings.²¹ Thus, rather than merely seeking answers, embracing imagination encourages the formulation of increasingly complex and nuanced questions, thereby fostering a cycle of inquiry that demands creative problem-solving. Thomas and Seely Brown suggest that considering NCOL as a philosophical foundation for learning in online settings can provide a platform for learners to explore alternative perspectives and devise innovative problem-solving approaches. Within these environments, interactive discussions could prompt learners to consider unconventional strategies or viewpoints, fostering imaginative thinking and nurturing creativity within their respective athletic or coaching practices.

Questioning. Given the accessibility of vast information networks, Thomas and Seely Brown suggest that the nature of the questions we ask in the learning process must be adapted.²¹ As above, for instance, while questions such as: 'what do we know about this?' are suitable in stable knowledge contexts; questions such as: 'what don't we know?' and 'what else do we need to find out?' better reflect the dynamic nature of a world in-flux.²¹ Within the context of ORC/CD, this perspective encourages educators to approach online/remote learning with an attitude of exploration and curiosity. As highlighted above, the focus is not only on acquiring knowledge, but also on cultivating critical thinking skills and the ability to navigate a rapidly evolving digital landscape. This perspective acknowledges

the importance of embracing uncertainty, promoting intellectual curiosity, and developing a mindset of lifelong (or ‘arc-of-life’) learning.²¹ Indeed, this is similar to that which has been promoted within the coach education literature.³⁶

In sum, Thomas and Seely Brown argue that enhancing learning outcomes in digital spaces is achieved through the integration of playfulness, imagination, questioning, and boundaries.²¹ For us, incorporating the NCOL perspective as a philosophical foundation for ORC/CD not only acknowledges the unique challenges and interconnected nature of contemporary learning environments, it builds upon existing scholarly work in the field of coaching^{29–32} – particularly as coaches and coach developers play a role in facilitating critical thinking and inquiry-based learning through open-ended questions and structured activities.^{7,37} Nevertheless, while positioning ORC/CD within the NCOL framework may prove helpful in guiding future research and praxis, it is also important to acknowledge and critically examine its limitations. We now turn our attention to the critiques of Thomas and Seely Brown’s work, in order to better evaluate the applicability and effectiveness of this philosophical framework.

Limitations and critiques of NCOL

Hess et al.³³ raise several critiques regarding the NCOL theory. Firstly, they question the originality of NCOL, asserting that previous discussions, such as Barr and Tagg’s³⁸ call for a shift to paradigms of *learning* (i.e. not *teaching*), have covered similar ground. This challenges the notion of NCOL as a ‘new’ concept.^c Additionally, Hess et al. argue that the theory fails to fully recognize the extensive work already done in embracing learner-centred education (e.g. Finkel³⁹; Brookfield and Preskill⁴⁰). Certainly, in the context of sport coaching and coach development, similar assertions have been made – with Kidman⁴¹ advocating for a shift away from transmission models of learning many years prior to the release of Thomas and Seely Brown’s NCOL book. Thus, from our perspective, Thomas and Seely Brown’s NCOL builds upon a foundation of established scholarly contributions – albeit, with an emphasis on the use of digital and online tools to advance learner-centered approaches.

Notwithstanding, the suggestion that online environments can encourage inquiry-based, learner-centric, and diverse learning opportunities does not always hold true. In particular, the surge in Massive Open Online Courses (MOOCs) – including within the field of coach education⁴² – has occurred with a concurrent tendency to adopt a transmission model of instruction.⁴³ Moreover, the weight Thomas and Seely Brown place on online learning environments does not seem to recognise the digital divide and disparities in access to technology among different socioeconomic groups.⁴⁴ This highlights the need for

careful consideration of instructional design, pedagogical approaches, participant numbers, and critical evaluations of online platforms. Optimistically, then, ORC/CD practitioners and researchers can play a crucial role in exploring the digital divide and devising solutions to bridge the gap.

Recognising its limitations, we maintain that NCOL provides a perspective that is closely aligned with directions in contemporary sport coaching literature.^{32,45,46} Hence, we propose that NCOL serves as an appropriate philosophical framework to guide the research and practical applications of ORC/CD. With this as our philosophical position, the following section seeks to address our second intention: locating Connectivism, (re)conceptualised within a Deluzian notion of New Materialism, as a suitable onto-epistemological stance from which to conduct future research.

Connectivism and new materialism to inform ORC/CD research

Connectivism is characterised by four critical traits that underpin connective knowledge networks: diversity, autonomy, interactivity, and openness.⁴⁷ Based on our discussion above, we find that these characteristics align with and enhance the philosophical underpinnings of NCOL in the context of ORC/CD. As such, we now explore Connectivism as a suitable onto-epistemological framework to guide research in this area.

In doing so, we consider the emphasis Connectivism places on the use of technology to build networks, thus emphasising the ability and necessity to learn as a part of a networked world.^{25,48} This is the reality of the digital age, and therefore, should provide a useful lens from which to investigate the phenomenon of ORC/CD in future scholarship. We start by exploring the relationship between Connectivism and New Materialism in order to consider a perspective that goes beyond traditional human-centred thinking.

New materialism: post-humanist perspective of ORC/CD research

While online learning, online interactions, and online gaming have become integrated into contemporary life, and play an integral part in how we develop and perceive truth, research exploring online environments has compartmentalised technology as a technical ‘object’.^{3,4,11} Such research is an expression of a humanist ontology, which may also lead to the separation of the object (e.g. online environments) from human subjects (e.g. coach, athlete); thus placing human subjects at the heart of knowledge production or what we perceive as truth. This implies that objects are seen as passive carriers of meaning, merely

existing in the background of human interactions and awaiting human action.⁴⁹ This raises a fundamental question about the nature of reality: if online environments are viewed as primarily shaped through human intervention, does this create a binary relationship that restricts the role of technology in generating knowledge and understanding?

Arguably, the humanistic approach highlights how technology is objectified, and as a result, the question of *how we are connected* is taken for granted. Simply, we interact (or research interaction) through ‘technology’. Thus, the way(s) in which coaches/coach developers use online environments as a tool to deliver what they would face-to-face becomes the focus of our investigations. Online environments are continually changing and evolving, and a humanist approach assumes that coaches/coach developers can control such change through reasoning and science.⁵⁰ This potentially restricts our understanding of how learners and technology are connected. From a post-humanistic standpoint, everything is connected – humans, non-humans, machines, and objects^{51,52}; and these connections enable learning and knowing to occur through a process of ‘intra-acting.’⁵³ Thus, we suggest that, to explore ORC/CD more fully, researchers should adopt a post-humanist ontology. That is, the view that there is no subject/object divide, but rather a post-humanist subject that is connected and made through multiple other subjects – including people, animals, ideas, and technologies.⁵⁴ The human actors (i.e. athletes/coaches/coach developers) and nonhuman actors (i.e. online environments) act as a whole, both inseparably entangled.⁵⁵ Taylor et al.⁵⁶ describe this as an ‘ontologically lively’ perspective, which emphasises the interconnectedness of all things – including technology.⁵⁷

Here, we note strong synergies with Deleuze’s relational New Materialism.⁵⁸ Importantly, Deleuze and Guattari⁵⁸ argue that different domains of reality, such as the psychological, cultural, biological, and technological have equal status as they are intertwined in relational networks. Indeed, research adopting such a post-humanist approach is not novel within sport coaching, and previous scholarship adopting this perspective has impacted our understanding of what constitutes ethical coaching practice when delivered face to face.⁵⁹ (See Gearity et al.⁶⁰ for a Foucauldian deconstruction of ‘caring’ in the coach-athlete relationship.) However, when researching the emerging area of ORC/CD, there still appears to be a tendency to favour the humanistic, dualist perception that things have fixed identities, features, and capacities.¹⁵ Thus, we suggest that researchers adopt a relational New Materialism framework to investigate the relationship between social interactions—such as those between coaches and athletes or between coaches and coach developers—and the material world, including online environments and technology. Doing so may illuminate new possibilities for enhancing learning in these settings.

To advance expressions of New Materialism, we suggest a philosophical approach that could further our understanding of intra-action with technology in coaching – that is, the theory of Connectivism.^{25,26}

A rationale for connectivism

Connectivism has been described as a learning theory,^{61–63} an adaption to previous learning theories,⁶⁴ a pedagogy,^{65–67} and a philosophy.^{68,69} Previous research has underscored the usefulness of Connectivism as a theory to enhance online learning,⁷⁰ while more recent scholarship posited Connectivism as a pathway for pandemic-driven education.⁷¹ Similarly, Omodan⁷² has suggested that Connectivism is an unignorable, post-humanistic ontology to further learning in online environments in higher education. While a detailed review of these different interpretations is beyond the remit of this paper, we note a gap in research that attempts to position Connectivism as an onto-epistemological approach within ORC/CD.

From an ontological standpoint, Gerard and Goldie⁷³ suggest that Connectivism describes a network of knowledge ‘nodes’ (points of contact) influenced by technology. Networks are comprised of two or more nodes, which are linked in order to share resources. These can be small and local, or vast and global, and it is from these nodes and networks that communities of learning, ideas, and concepts emerge. Learning occurs through the construction and traversing of networks, and the recognition of salient patterns by perceivers in the network. Connectivism views the learning process as cyclical. We connect to a network to find and share new information, modify our beliefs in terms of new learning, and then reconnect to share our new understandings and find further information. Knowledge is viewed as a process, fluid and dynamic, flowing through networks of humans and their artefacts. Knowledge or truth becomes part of the network, with the network being an example of the entanglement of human and non-human subjects open to multiple interpretations and change.²⁵

Knowledge has often been classified into being qualitative and quantitative. However, Connectivism adds a third type of ‘connective knowledge.’⁷⁴ As Cabrero and Román⁶⁴ describe:

knowledge is something unpredictable, unstable, uncontrollable and in continuous growth, which means that it goes beyond the total control of a person and might be in their external networks (communities, digital devices, etc.) constantly changing. (p. 30)

In this way, Connectivism addresses the Deluzian notion, as well as NCOL’s core premise, that different realms of reality have equal status for the learner to draw upon as connections in the network.

From an epistemological perspective, Connectivism also addresses an often-neglected aspect of learning specific to the digital age. Learning theories such as behaviourism (what we do), cognitivism (what we think), and constructivism (how we make sense), were developed when learning was not as overtly influenced by technology.⁷¹ While scholars have argued about the similarities between Connectivism and constructivism, such as the role of the learner in the learning process,⁷¹ Connectivism goes beyond the cognitive and constructivist aspects of learning to describe how one adapts to the ever-changing (digital) environment. In essence, then, Connectivism incorporates an appreciation for the interactions within networks as this relates to knowledge and learning.

Connectivism and its relevance to ORC/CD

Siemens suggests that “as knowledge continues to grow and evolve, access to what is needed is more important than what the learner currently possesses.”²⁶, p. 8 Therefore, with the half-life of knowledge quickly decreasing, knowing *how* to access and intra-act with the necessary information, and determine its value, are core requirements in the twenty-first century. Furthermore, in today’s environment, action is often needed without personal learning – that is, we need to act by drawing on information outside of our primary knowledge base. Hence, the ability to synthesise and recognise connections and patterns is a valuable skill.²⁶ In this way, Connectivism is far more concerned with network formation – that is, how we access knowledge – rather than knowledge acquisition.^{25,61}

In Connectivism, ‘knowing’ occurs when the learner recognizes the interconnections among concepts, ideas, and perspectives accessed through internet technologies like AI-generated ‘chat’ platforms, electronic databases, search engines, and other online resources. In this way, networked information technologies are considered integral to the learning process within the framework of Connectivism. Hence, Connectivism has the capacity to shed further light on the foundational dynamics of a particular social context within ORC/CD as it directs attention towards the formation of networks (among humans, objects, etc.) and their significance in shaping the learning landscape.^{75,76}

In our view, Connectivism serves as an extension of New Materialism, aiming to understand how the social and material worlds interact to produce truth in our networked society.⁷⁷ We argue in line with Downes⁶¹ that the epistemological approach of Connectivism is not to support traditional content models of learning (i.e. behaviourism, cognitivism, etc.), but to develop a network environment that enhances the capacity to learn.

Therefore, we posit that Connectivism provides an epistemological basis to keep up with the rapid evolutions of technology and knowledge in the digital age; and begins to address the potential limitations of humanistic

approaches to research⁷⁸ – particularly in the field of ORC/CD.

Over the past decades, research has mainly utilised Connectivism as a constructivist learning theory⁶¹ by combining social constructivism with technological pedagogy.⁷¹ However, the idea of using Connectivism as both an underlying methodology and an expression of New Materialism in ORC/DC practice is still in its early stages. Therefore, we aim to provoke the reader to consider how the equal status and intra-action of different domains contributing to knowledge production might influence future research when exploring ORC/CD practice.

Heutagogy as a signature pedagogy for ORC/CD

Shulman²⁷ proposes that, within the context of their specific domain of inquiry, educators often develop signature pedagogies that standardised the types and nature of instruction in that discipline. Yet, left unquestioned, a signature pedagogy may not always be the most effective or relevant approach for a specific context. Moreover, as Glassner and Back suggest, “the rapid rate of changes in society, the knowledge economy, and the so-called information explosion... [means that] we should be looking for an educational approach in which the learner himself (*sic*) determines what to learn and how his learning should take place.”²³, pp. 63–64 This sentiment forms the basis for our final consideration: what might be the most effective or relevant ‘~gogy’ for ORC/CD? Recalling, once more, Cushion and Townsend’s¹⁵ suggestion that effective ORC/CD delivery should be underpinned by a suitable learning framework, we now consider a signature pedagogy for the ORC/CD practitioner by turning to heutagogy as one way in which to emphasise learner agency, self-efficacy and capability, reflection, and the nonlinearity of the learning process.^{79,80} Indeed, this exploration is consistent with our discussions above, given that both NCOL and Connectivism support passion-driven and self-determined learning.⁸¹

An overview of heutagogy

Heutagogy is a method of self-determined education where the interests and motivations of the learner establish a focus area for new learning.⁸² According to Blaschke and Hase:

The combined trends of learner-centred teaching and ubiquitous technology use in the classroom have given instructors a unique opportunity to support students in developing lifelong learning skills. Heutagogy (or self-determined learning) provides a promising framework for capitalizing on these developing trends, drawing on established learner centred education theories that strongly emphasize

learner autonomy. The key principles of heutagogy... provide a foundation for designing and developing learning ecologies, the potential of which can be further maximized through the use of digital media.⁸³, p. 1

In simple terms, the heutagogical approach views the role of the educator – or in our case, the coach/coach developer – as a guide for the learner, providing formative feedback that is personalised according to the learner's needs. The role of the learner, then, is to self-determine what the focus of learning will be at that moment. According to Blaschke and Hase,⁸³ heutagogy promotes a learner-centred approach⁸⁴ and holds the idea of learner agency and autonomy in particularly high regard.⁸⁵

Following Blaschke and Hase,⁷⁹ below are some of the underpinning principles of the heutagogical approach to be considered by ORC/CD practitioners:

- learning is not dependent on the coach/coach developer; rather, it can be triggered by the learner's experience
- learning is focused upon the learner's needs and motivations, not a set body of content/curriculum
- learning is characterised by self-sufficiency and personal exploration
- learning is demonstrated in the ability to change one's way of thinking and acting
- learning is applied and demonstrates the creation of connections beyond theory
- learning is fun and self-determined

Heutagogy assumes that the learner needs to be involved in the negotiation of what and how learning will occur throughout the design and learning process.⁸⁵ In this way, curriculum/content is required to be flexible, responding to shifts in the learner's motivations and thinking/understanding as learning progresses. This requires both learner and educator (i.e. athlete and coach; coach and coach developer) to negotiate how learning is to be measured, thus emphasising self- and peer-reflection as key to the learning process.⁸⁶ As Jones et al.⁸⁷ advance, the heutagogic learning environment incorporates opportunities for learners to explore and reflect on *what* they have learned, and *how* they learned it – both critical aspects of the 'double-loop' learning process.⁷⁹

Heutagogy and its relevance to ORC/CD

Advocates of heutagogy posit that giving responsibility of the learning process to the learner encourages the development of self-efficacy and capability.⁸³ In this sense, there is a notable shift from knowledge transfer and high levels of direction to an emphasis on process.⁸⁷ Here, we note synergies with recent sport coaching scholarship that similarly emphasises the value of creating and maintaining learner-centred environments for the purpose of enhanced learning experiences and motivation.^{32,37} Encouragingly, we see this as an opportunity to further explore approaches that are

congruent with research-informed 'best practice' that can be applied in ORC/CD contexts.

Drawing once again on the NCOL perspective, we posit that heutagogy is a relevant '~gogy' to consider in the practices and processes of ORC/CD – especially given its emphasis on playful, self-determined, and therefore, relevant ways of making meaning in the digital age. Mindful of the potential for changing needs and expectations of contemporary learners, further exploration of the heutagogical approach in ORC/CD offers a promising opportunity for innovation and progress in the field. In accordance with Jones et al.⁸⁷ however, we do not present heutagogy as a replacement for pedagogy in ORC/CD. Like Blaschke and Hase⁸³ and Stoszowski and Collins,^{6,7} we concede that the needs of the learner, the context, and the content should determine how the ORC/CD practitioner adjusts his/her practice in online and remote learning settings. To this end, we suggest that, foremost, a willingness to experiment with this approach is an important step towards a broader view of congruent signature '~gogies' in ORC/CD contexts.

Considerations for heutagogy in ORC/CD

With some exceptions^{6,7} scholarship conducted on the challenges of implementing a heutagogical approach have tended to focus on its use in face-to-face, classroom environments.⁸⁸ Notwithstanding the differences in context, learnings from the literature suggest that the use of heutagogy in ORC/CD contexts may require strategies to manage: the abundance and suitability of information accessed by learners⁸⁹; the extra time required to design the learning encounter; assessment of learner progression; and the (un)willingness of some institutions (or stakeholders therein) to surrender control of a curriculum.⁹⁰ Further, although self- and peer- reflections are strategies that have been advocated for as a part of effective coach development,⁹¹ Cushion⁹² has suggested that learning can still be viewed as dependent on 'expert knowledge'. That is, despite a plethora of scholarship advocating for increased constructivist-informed (i.e. learner-centred) coaching,³² researchers have noted that some learners tend to resist a move away from passive learning.⁹³ As a result, active learning approaches, such as self-determined learning, can be a cause of tension for learners with incongruent epistemologies.⁸⁸

Recent scholarship by Stoszowski and colleagues^{6,7} provides an overview of heutagogy in coach development. Acknowledging the potential of the heutagogical approach to develop learners' capacity for critical thinking, problem solving, confidence, and ability to question their own beliefs, values, and assumptions, Stoszowski and colleagues suggest that some caveats should be considered. For instance, a higher level of emotional maturity appears to be preferable within the heutagogy framework.⁶ Indeed,

Blaschke and Hase⁹⁴ have suggested that the learner's belief in his or her own abilities (i.e. self-efficacy) constitutes a core principle in heutagogical learning experiences. Here, learners who considered learning as, primarily, the retention or storage of facts⁹⁵ were less likely to seek out educative opportunities in comparison to those who considered the outcome of learning as a shift in perspective.⁹⁶ Stoszkowski and Collins⁶ also posit that, in addition to higher emotional maturity, relativist attitudes towards learning may also predict the efficacy of and involvement in self-driven heutagogical approaches. This is mirrored by research examining the self-determined learning element in Connectivist courses, with the conclusion that not all learners were able to autonomously direct their own learning.⁹⁷

Clearly, previous scholarship that has begun to explore the introduction of heutagogy to (albeit, tertiary-based) coach development contexts suggests that the approach may suit some more than others. Nevertheless, advocates of the heutagogical approach^{85,90} contend that the potential benefits to the learner's experience surmount the drawbacks – especially in online or remote settings where the process of negotiating and co-creating the learning environment provides opportunity for autonomy and higher levels of motivation.⁹⁸ Indeed, as Blaschke suggests, “learners will require ongoing instructor guidance and support throughout the learning process if they are to develop the capability of self-direction.”⁹⁹, p. 66

Final thoughts

The emergence of ORC/CD as a field of research and praxis denotes a willingness to embrace new ways of interacting with learners in sport coaching and coach development. Notwithstanding a recent surge of inquiry (i.e. a special edition in the *International Sport Coaching Journal* on the topic of online and remote sport coaching),² this remains an underdeveloped area of research in the broader field of sport coaching. As an emerging field, then, coaching scholars and practitioners have the exciting opportunity to explore a range of innovative technological applications in human movement settings. In this article, we have recognised the opportunity to theorise about possible directions and approaches that could inform practice and scholarship in ORC/CD contexts. Recognising that there are other possible theories to draw on in this space, we have attempted to philosophically position ORC/CD within the NCOL perspective, and posit a view of Connectivism (grounded in New Materialism) as a possible onto-epistemological foundation for ORC/CD research. We have also proposed that heutagogy may be a suitable signature ‘~gogy’²⁷ to assist practitioners when working online/remotely with contemporary learners in the context of sport coaching and coach development.

We conclude this article with some suggestions for future research. Research conducted within the philosophical

framework of NCOL has the potential to prompt a re-evaluation of deeply entrenched beliefs within coaching. Like Hess et al.³³ for instance, whose purposeful efforts to embed playfulness, imagination, and questioning into their practice challenged long-held assumptions about learning. Similarly, research could explore the utility of emphasising creativity and passion-driven learning (consistent across the NCOL perspective and the heutagogical project) as a means for ORC/CD practitioners to foster learner autonomy and engagement. Likewise, and building on Stoszkowski and colleagues' work in tertiary-based coach development settings, the heutagogical project could be investigated (longitudinally) in a range of mandated and non-mandated coach development settings. Researchers may also consider how positioning their interpretations within a Connectivism framework could allow for novel insights on how, when, and where (new) knowledge is produced in online environments. We believe that this would be a useful way to recognise the role of the complex, online networks that athletes, coaches, and coach developers can (and do) access as a part of their learning.

From an applied standpoint, the way in which National Governing Bodies and other coaching/coach development stakeholders adopt and embrace ORC/CD requires further exploration. In particular, the potential issues of digital poverty and limitations in access to remote/online learning opportunities. Similarly, the possible tensions and differences between schools/clubs, teaching/coaching, students/athletes, and coaching/coach development in online and remote learning contexts might also generate findings that advance the field.

We hope that our suggested philosophical, onto-epistemological, and heutagogical positioning of ORC/CD inspires further scholarship and critical debate. In this way, we can, collaboratively, expose new research opportunities to align ORC/CD with the digital age.

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Notes

- a. Although we acknowledge the occupational differences in the ‘coaching’ and ‘coach educator/developer’ roles, we consider both to share the educative goal of supporting and facilitating

- learning in their respective domains. It is with this common purpose in mind that we discuss the concepts herein.
- b. Mindful of the speed in which technology develops and influences social and educational contexts, we recognize that the dates of scholarship presented here must be considered for their 'currency'. At the time of writing the current article, Thomas and Seely Brown's work is over a decade old. However, we suggest that the NCOL is just as, if not more relevant in the post-COVID19 era – particularly as traditional education/sport coaching settings have been 'opened up' to novel approaches and attitudes to learning in digital spaces. We maintain that, in this case, Thomas and Brown's 2011 work is appropriately located and entirely relevant to our discussion.
- c. To better resemble a contemporary or novel perspective, it may be worthwhile exploring alternative terms such as "networked culture(s) of learning" in future research endeavours. For now, though, examining this further falls outside the scope of the current article.

References

- Callary B, Brady A, Kiosoglous C, et al. Making sense of coach development worldwide during the COVID-19 pandemic. *Int J Sport Commun* 2020; 13: 575–585.
- Szedlak C, Bennett BC and Smith M (eds). Special issue in online and remote coaching: exploring coaching delivery and coach education in online/digital environments. *Int Sport Coach J* 2023; 10: 313–315.
- Bennett BC. The video coach—reflections on the use of ICT in high-performance sport. *Int Sport Coach J* 2020; 7: 220–228.
- Bennett BC. My video coach—a phenomenographic interpretation of athlete perceptions of coaching through a live video feed. *Qual Res Sport Exerc Health* 2021; 13: 455–472.
- Stoszkowski J, Hodgkinson A and Collins D. Using Flipgrid to improve reflection: a collaborative online approach to coach development. *Phys Educ Sport Pedagogy* 2021; 26: 167–178.
- Stoszkowski J and Collins D. Nirvana or never-never land: does heutagogy have a place in coach development? *Int Sport Coach J* 2017; 4: 353–358.
- Stoszkowski J and Collins D. The agony and the ecstasy: student-coaches' perceptions of a heutagogical approach to coach development. *Int Sport Coach J* 2018; 5: 136–144.
- Simonson M, Smaldino S and Zvacek S. *Teaching and learning at a distance: foundations of distance education*. Charlotte: Information Age, 2019.
- Picciano AG. *Online education: Foundations, planning, and pedagogy*. London: Routledge, 2018.
- Seaman JE, Allen E and Seaman J. Grade increase: tracking distance education in the United States. Audit Report. Report No.: ED-OIG/A05P0013, 2018. Chicago/Kansas City: United States Department of Education, Office of Inspector General.
- Szedlak C, Smith M and Callary B. "Nothing was lost sailing-wise and lots is gained on a personal level": practitioners' behaviors and athletes' perception of working in online environments. *Psychol Sport Exerc* 2022; 63: 1–8.
- Windt J, MacDonald K, Taylor D, et al. "To tech or not to tech?" A critical decision-making framework for implementing technology in sport. *J Athl Train* 2020; 55: 902–910.
- Fyall G, Bennett BC and Cowan J. Online learning in a HP sport environment - a mixed method study. *Int Sport Coach J* 2023; 10: 359–372.
- Murray E, Bennett BC and Spencer K. Exploring different forms of technology enhanced learning strategies in a handball coach education programme. *Int Sport Coach J* 2023; 10: 387–398.
- Cushion CJ and Townsend RC. Technology-enhanced learning in coaching: a review of literature. *Educ Rev* 2019; 71: 631–649.
- Blanchfield J, McArdle J and Haughey T. Sports coaching in an online space: what can we learn from endurance sport coaches? *Int Sport Coach J* 2023; 10: 328–339.
- Vinson D, Beeching K, Morgan M, et al. Collaborative evaluation of individual and team performance in training and match environments using the coach logic online platform. *Int Sport Coach J* 2017; 4: 47–62.
- Pope JP, Stewart NW, Law B, et al. Knowledge translation of sport psychology to coaches: coaches' use of online resources. *Int J Sports Sci Coach* 2015; 10: 1055–1070.
- Farhat J, Deck S, Mitchell M, et al. If you build it, will they come? Assessing coaches' perceptions of a sport psychology website. *Int J Sports Sci Coach* 2022; 17: 490–499.
- Da Silva EJ, Mallett CJ, Sánchez-Oliva D, et al. A coach development program: a guided online reflective practice intervention study. *J Sports Sci* 2022; 40: 1042–1054.
- Thomas D and Seely Brown J. *A new culture of learning: cultivating the imagination for a world of constant change*. Lexington: CreateSpace, 2011.
- Saykili A. Distance education: definitions, generations, key concepts and future directions. *Int J Contemp Educ Res* 2018; 5: 2–17.
- Glassner A and Back S. *Exploring heutagogy in higher education: academia meets the Zeiugeist*. Singapore: Springer Nature, 2020.
- Hew KF and Cheung WS. Use of Web 2.0 technologies in K–12 and higher education: the search for evidence-based practice. *Educ Res Rev* 2013; 9: 47–64.
- Downes S. *Connectivism and connective knowledge: essays on meaning and learning networks*. Ottawa: National Research Council Canada, 2012.
- Siemens G. Connectivism: a learning theory for the digital age. *Int J Instr Technol Distance Learn* 2005; 2. https://www.itdl.org/Journal/Jan_05/article01.htm
- Shulman LS. Signature pedagogies in the professions. *Daedalus* 2005; 134: 52–59.
- Thomas D. *A new culture of learning: Douglas Thomas at TEDxUFM [Video]*, <https://www.youtube.com/watch?v=IM80GXlyX0U&t=589s> (2012).
- Culver DM, Werthner P and Trudel P. Coach developers as 'facilitators of learning' in a large-scale coach education programme: one actor in a complex system. *Int Sport Coach J* 2019; 6: 296–306.
- Cassidy T and Kidman L. Initiating a national coaching curriculum: a paradigmatic shift? *Phys Educ Sport Pedagogy* 2010; 15: 307–322.
- Light R and Wallian N. A constructivist-informed approach to teaching swimming. *Quest* 2008; 60: 387–404.

32. Pill S (ed). *Perspectives on athlete-centred coaching*. London: Routledge, 2018.
33. Hess ME, Gallagher EV and Turpin K. A new culture of learning. *Teach Theol Relig* 2014; 17: 227–246.
34. Verwijmeren S, de Vries JD and Bakker AB. Playful sport design: a game changer? *J Appl Sport Psychol* 2023: 1–30.
35. Tang T, Vezzani V and Eriksson V. Developing critical thinking, collective creativity skills and problem solving through playful design jams. *Think Skills Creat* 2020; 37: 100696.
36. International Council for Coaching Excellence, Association of Summer Olympic International Federations and Leeds Metropolitan University. *International sport coaching framework (version 1.2)*. Champaign, IL: Human Kinetics, 2013.
37. Light RL and Harvey S. Positive pedagogy for sport coaching. *Sport Educ Soc* 2017; 22: 271–287.
38. Barr RB and Tagg J. From teaching to learning—a new paradigm for undergraduate education. *Change: The Mag High Learn* 1995; 27: 12–26.
39. Finkel DL. Teaching with your mouth shut. *Educ Rev* 2000. DOI: 10.14507/er.v0.139.
40. Brookfield SD and Preskill S. *Discussion as a way of teaching: tools and techniques for democratic classrooms*. 2nd ed. CA: John Wiley & Sons, 2012.
41. Kidman L. *Athlete-centred coaching: developing inspired and inspiring people*. Wellington: IPC Print Resources, 2005.
42. Lara-Bercial S, Hodgson G, Lara-Bercial P, et al. The coach developer as a learning designer: an insight into the development of the ICOACHKIDS massive open online courses. *Int Sport Coach J* 2023; 10: 410–420.
43. Daradoumis T, Bassi R, Xhafa F, et al. A review on massive E-learning (MOOC) design, delivery and assessment. In: 2013 eighth international conference on P2P, parallel, grid, cloud and internet computing, Compiègne, France, 2013, pp.208–213. DOI: 10.1109/3PGCIC.2013.37.
44. Suraci C, Pizzi S, Montori F, et al. 6G To take the digital divide by storm: key technologies and trends to bridge the gap. *Future Internet* 2022; 14: 189.
45. Kidman L and Lombardo B. *Athlete-centred coaching: developing decision makers*. 2nd ed. Wellington: IPC Print Resources, 2010.
46. Vinson D and Bell J. Athlete-centred coaching: an applied example from junior international field hockey. In: E Cope and M Partington (eds) *Sports coaching: a theoretical and practical guide*. London: Routledge, 2019, pp.40–52.
47. Siemens G, Rudolph J and Tan S. “As human beings, we cannot not learn”. An interview with Professor George Siemens on connectivism, MOOCs and learning analytics. *J Appl Learn Teach* 2020; 3: 108–119.
48. Downes S. *Toward personal learning: reclaiming a role for humanity in a world of commercialism and automation*. <https://www.downes.ca/files/books/Toward%20Personal%20Learning%20v09.pdf> (2017).
49. St. Pierre EA, Jackson AY and Mazzei L. New empiricisms and new materialisms. *Cult Stud Crit Methodol* 2016; 16: 99–110.
50. Wentzer TS and Mattingly C. Toward a new humanism: an approach from philosophical anthropology. *HAU: J Ethnogr Theory* 2018; 8: 144–157.
51. Hasse C. Posthuman learning: AI from novice to expert? *AI Soc* 2019; 34: 355–364.
52. Hasse C. Humanism, posthumanism, and new humanism: how robots challenge the anthropological object: posthumanism. In: MH Bruun (eds) *The Palgrave handbook of the anthropology of technology*. Singapore: Springer Nature Singapore, 2022, pp.145–164.
53. Barad K. *Meeting the universe halfway: quantum physics and the entanglement of matter and meaning*. North Carolina: Duke University Press, 2007.
54. Mol A. I eat an apple: on theorizing subjectivity. *Subjectivity* 2008; 22: 28–37.
55. Pickering A. *The mangle of practice: time, agency, and science*. Chicago: University of Chicago Press, 1995.
56. Taylor C, Fairchild N, Elmenhorst C, et al. Improvising bags choreographies: disturbing normative ways of doing research. *Qual Inq* 2019; 25: 17–25.
57. Welch TJ. Entangled species: the inclusive posthumanist eco-poetics of Juliana Spahr. *J Ecocriticism* 2014; 6: 1–25.
58. Deleuze G and Guattari F. *A thousand plateaus: capitalism and schizophrenia*. London: University of Minnesota Press, 1987.
59. Markula P. *Deleuze and the physically active body*. New York, NY: Routledge, 2019.
60. Gearity BT, Fisher LA, Yandt A, et al. Deconstructing caring in the coach-athlete relationship: a gentler form of domination. *Sports Coach Rev* 2021; 1: 1–21.
61. Downes S. Recent work in connectivism. *Eur J Open, Distance E-Learn (EURODL)* 2019; 22: 113–132.
62. Utecht J and Keller D. Becoming relevant again: applying connectivism learning theory to today’s classrooms. *Crit Quest Educ* 2019; 10: 107–119.
63. Kropf DC. Connectivism: 21st century’s new learning theory. *Eur J Open, Distance E-Learn* 2013; 16: 13–24.
64. Cabrero RS and Román ÓC. Psychopedagogical predecessors of connectivism as a new paradigm of learning. *Int J Educ Excell* 2018; 4: 29–45.
65. Fondo M, Konstantinidis A. Design of a MOOC on personal language learning environments for digital language skills development. In: P Taalis, J Jalkanen, L Bradley, et al. (eds) *Future-proof CALL: language learning as exploration and encounters—short papers from EUROCALL*. UK: Research-publishing.net, 2018, pp.64–69.
66. Mahmud MA, Ali AM and Shah A. Massive open online courses as an augmentation of E-learning: a review. *Int J Perceptive Cogn Comput* 2018; 4: 1–4.
67. Zaluski JC, Lopes RB and Schlünzen K. Initial considerations about a rhizomatic learning environment. *Rev Ibero-Americana Estud Educ* 2018; 13: 489–499.
68. Anderson T and Dron J. Three generations of distance education pedagogy. *Int Rev Res Open Distrib Learn* 2011; 12: 80–97.
69. Anderson T and Dron J. Learning technology through three generations of technology enhanced distance education pedagogy. *Eur J Open, Distance E-learning* 2012; 3: 80–97.
70. Siemens G. *MOOCs are really a platform*. Retrieved 15th January 2016, from Elearnspace.
71. Boyraz S and Ocak G. Connectivism: a literature review for the new pathway of pandemic driven education. *Int J Innov Sci Res Technol* 2021; 6: 1122–1129.
72. Omodan BI. Analysis of connectivism as a tool for posthuman university classrooms. *J Curriculum Stud Res* 2023; 5: 1–2.
73. Gerard J and Goldie S. Connectivism: a knowledge learning theory for the digital age? *Med Teach* 2016; 38: 1064–1069.

74. Hung NM. Using ideas from connectivism for designing new learning models in Vietnam. *Int J Inf Educ Technol* 2014; 4: 76.
75. Kathleen Dunaway M. Connectivism: learning theory and pedagogical practice for networked information landscapes. *Ref Serv Rev* 2011; 39: 675–685.
76. Khatibi M and Fouladchang M. Connectivism: a review. *The Int J Indian Psychol* 2015; 2: 82–93.
77. Davidson R and Glassner A. Cross-border collaborative learning in the professional development of teachers. In: Y Rosen, S Ferrara and M Mosharraf (eds) *Handbook of research on technology tools for real-world skill development*. Hershey, PA: IGI Global, 2016, pp.558–588.
78. Foroughi A. The theory of connectivism: can it explain and guide learning in the digital age? *J High Educ Theory Pract* 2015; 5: 11–26.
79. Blaschke LM and Hase S. Heutagogy: a holistic framework for creating 21st century self-determined learners. In: MM Kinshuk and B Gros (eds) *The future of ubiquitous learning: learning designs for emerging pedagogies*. Heidelberg: Springer Verlag, 2015, pp.25–40.
80. Hase S. Self-determined learning (heutagogy): where have we come since 2000? *SIT J Appl Res* 2016: 2–21.
81. Conradie PW. Supporting self-directed learning by connectivism and personal learning environments. *Int J Inf Educ Technol* 2014; 4: 254–259.
82. Hase S and Kenyon C. From Andragogy to Heutagogy. *ultiBASE*, <http://ultibase.rmit.edu.au/Articles/dec00/hase2.htm> (2000).
83. Blaschke LM and Hase S. Heutagogy and digital media networks. *Pac J Technol Enhance Learn* 2019; 1: 1–14.
84. Rogers CR. *On becoming a person: a therapist's view of psychotherapy*. United States: Houghton Mifflin Company, 1961.
85. Hase S and Kenyon C. *Self-determined learning: heutagogy in action*. London: Bloomsbury Academic, 2013.
86. Dick B. Crafting learner-centered processes using action research and action learning. In: S Hase and C Kenyon (eds) *Self-determined learning*. London: Bloomsbury, 2013, pp.39–53.
87. Jones C, Penaluna K and Penaluna A. The promise of andragogy, heutagogy and academagogy to enterprise and entrepreneurship education pedagogy. *Educ + Training* 2019; 61: 1170–1186.
88. Agonács N and Matos JF. Heutagogy and self-determined learning: a review of the published literature on the application and implementation of the theory. *Open Learn* 2019; 34: 223–240.
89. Kelly C and Lynes A. Grant Theft Heutagogy: a reflection on the utilization of video games as a teaching tool in the lecture theatre. *J Crim Justice Educ* 2022; 34: 617–633.
90. Moore RL. Developing lifelong learning with heutagogy: contexts, critiques, and challenges. *Distance Educ* 2020; 41: 381–401.
91. Callary B and Gearity B. *Coach education and development in sport: Instructional strategies*. NY: Routledge, 2019.
92. Cushion CJ. Reflection and reflective practice discourses in coaching: a critical analysis. *Sport Educ Soc* 2018; 23: 82–94.
93. Blaschke LM. Heutagogy: empowering students through self-determined learning [video], <https://www.youtube.com/watch?v=KPio1CWYe18> (2018).
94. Blaschke LM and Hase S. So, you want to do heutagogy: principles and practice. In: S Hase and LM Blaschke (eds) *Unleashing the power of learner agency*. EdTech Books, 2021, pp.21–40.
95. Entwistle NJ and Peterson ER. Conceptions of learning and knowledge in higher education: relationships with study behaviour and influences of learning environments. *Int J Educ Res* 2004; 41: 407–428.
96. Collins D, Abraham A and Collins R. On vampires and wolves—exposing and exploring reasons for the differential impact of coach education. *Int J Sport Psychol* 2012; 43: 255.
97. Kop R and Hill A. Connectivism: learning theory of the future or vestige of the past? *Int Rev Res Open Distrib Learn* 2008; 9: 1–3.
98. Hase S. Heutagogy and e-learning in the workplace: some challenges and opportunities. *J Appl Res Workpl E-Learn* 2009; 1: 43–52.
99. Blaschke LM. Heutagogy and lifelong learning: a review of heutagogical practice and self-determined learning. *Int Rev Res Open Distance Learn* 2012; 13: 56–71.