CONSTRUCTIVISM AND REFLECTIVE PRACTICE: AN EVIDENCE-BASED APPROACH TO TERTIARY TEACHING

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INTRODUCTION

A small group of Graduate Diploma in Tertiary Education (Level 7) learners and recent graduates, representing the taught Recognition of Prior Learning and Independent Learning Pathway programmes at Otago Polytechnic (OP), collaborated as a Community of Practice (CoP) to explore evidence-based teaching practice.

Examples of teaching philosophy statements employed and the process of preparing them were discussed at a professional practice symposium (Woodward et al., 2018). The audience was introduced to the use of metaphor and established frameworks, such as those developed by Chism (1998) and Schönwetter et al. (2002), for structuring teaching philosophy statements. A paper, "Developing a Teaching Philosophy for a Teaching Credential: Enablers, Challenges and Use of Metaphor" was presented at the 2019 Praxis Symposium (Woodward et al., 2019a) and published in *Scope* (Woodward et al., 2019b).

Subsequent research investigated key evidence-based (Cullen et al., 2017) theories and models that underpin pedagogical practice at OP; what drew teaching practitioners to particular theories; and how those theories link to teaching practice (Woodward et al., 2020b). A range of evidence-based pedagogy was identified (Woodward et al., 2020a), with the common denominator across all programmes – constructivism – investigated. Constructivist theories included the use of experiential learning (Knowles et al., 1998; Kolb, 2015) and reflection, scaffolding (Bruner, 1966) and social constructivism (Vygotsky, 1978). Each teacher was drawn to pedagogical theories depending on the 'fit' within their individual specialist areas (Woodward et al., 2020b). While constructivism is well documented as an evidence-based teaching theory, the use of constructivist pedagogy to more effectively engage learners, and to identify pedagogical tools using these frameworks for a more effective learning experience, across a range of teaching subjects, has not been widely explored.

Our CoP therefore set out to investigate which constructivist models/theories were employed in teaching practice and why they had been employed by teachers, and to identify the most effective constructivist pedagogical techniques used to engage learners across a range of subjects taught.

METHODOLOGY

Henry et al. (2020) identified Communities of Practice (CoP) as an effective social constructivist tool for building trust and a sense of belonging, sharing of enterprise and enhancing the reflectivity that is a precursor to independent learning. We therefore employed this social constructivist (Palincsar, 1998) approach to mine information from interviewees, all OP teachers/facilitators, using an autoethnographic (Maréchal, 2010) approach involving reflection on teaching experience. The CoP group met online on a regular (monthly) basis to explore the research questions, with all interviewees being members of the CoP and authors of the present article.

FINDINGS

1. What constructivist theories/models currently inform your teaching practice?

Jeremy, facilitating in business management, health and safety, and education, takes an approach grounded in constructivist theories and models. Reflecting on which of these models have had an impact on his practice, he highlighted scaffolding and the aligned framework of the zone of proximal development (ZPD) (Vygotsky, 1978). It is interesting to note that for many educators, including Jeremy, scaffolding is helpful because as Mercer (1994) argues, this approach resonates with what constitutes a successful learning intervention.

Wood et al. (1976) are regarded as the first to use the term scaffolding as a metaphor in the context of how learning – or, more specifically, how skill acquisition – could be improved in learners. Some key features associated with effective scaffolding include the aim of providing an appropriate level of assistance to help learners to achieve tasks and develop their understanding; by extension, if an educator gets their scaffolding approach just right, learners will be challenged and their abilities extended. There is a strong theoretical framework underpinning scaffolding, and its relationship with Vygotsky's (1978) theories of learning needs to be noted. It should be remembered, however, that although Vygotsky never used the term scaffolding, his ground-breaking work has been taken up in the work of others, like Bruner (1985), who have made the connections that learning is basically a social and cultural process, with educators having a role to promote effective shared learning experiences (Hammond & Gibbons, 1995). While Vygotsky's work is extensive, the most relevant aspect for discussion here is the ZPD, which Hammond and Gibbons (1995) argue provides the theoretical basis of scaffolding. In the context of education, the most significant feature of the ZPD is that the framework suggests the upper and lower limits of learning, or the zone within which new learning will take place.

Elise, working in the Bachelor of Information Technology (IT), has based her course design and delivery methods on several constructivist models, particularly in "Studio" courses where learners work in groups. Naturally, social constructivism (Vygotsky, 1978) fits this way of working, as group work encourages learners to learn from one another using collective scaffolding (Donato, 1994). The work undertaken in these courses is also largely experiential (Kolb, 1984), making use of cycles of doing and reflecting – including, importantly, allowing learners to make and learn from mistakes. However, experiential learning may not be effective in the IT context if the tasks set are too far outside the learners' ZPD (Vygotsky, 1978). In this case, scaffolding of learning (Wood et al., 1976), as described above, is central to the success of constructivism in the IT studio context throughout the three-year degree programme.

Shannon, working in the space of pregnancy, childbirth and early parenting education, believes that constructivist theory has significantly influenced her views on learning and teaching. Constructivist theorists share the overall philosophy that learning is an active, constructive process, whereby students construct their understanding and knowledge of the world based on their own unique experiences and their reflecting on those experiences. Learners build on their prior knowledge by comparing new ideas to the ones they already have and learn through the similarities and differences they discover (Bruner, 1966). Consequently, Shannon finds that constructivist models are a good fit for adult learners in her classes, who will often arrive with preconceived ideas and opinions about various pregnancy and parenting topics, based on things they have previously seen, heard, observed or maybe directly experienced already. Due to this collaborative nature of knowledge construction, expectant parents are embraced as active participants in the learning process and, as a result, Shannon steers her role away from a 'traditional teacher' model towards a facilitation role. She encourages her learners to explore, question, challenge and make their own informed decisions about pregnancy, birth and parenthood through experiential learning activities that require group interaction, problem solving, discussion, collaboration and reflection.

Cushla works with learners engaged in professional practice qualifications, at both undergraduate and postgraduate levels, across a variety of study areas. She believes that constructivist theories and models have strongly influenced her practice, further informed and underpinned by experiential learning and reflection. Although student

ownership of learning is not an idea that began with constructivism, the idea that the learner should play a primary role in determining their own learning needs and deciding how to best pursue these needs is a constructivist one (Driscoll, 2005). Both paradigms assume that learning begins with a personal desire to learn, and it is the instructor's initial responsibility to stimulate the learner's interest (Osterman, 1998). As a facilitator, Cushla uses constructivism and reflective practice to bridge the theory and practice gap for learners who, particularly in the undergraduate qualification, are often entering tertiary study later in life with little or no academic experience.

Alexa works in leadership for change, sustainable, and professional practice programmes, and brings a constructivist axiology to her work. This extends from an understanding that learning is a social activity (Dewey, 1963) and happens effortlessly within the ZPD. It recognises that oppression is built into the design of learning systems (Freire, 1993) and the power of education in reinforcing a dominant culture (Foucault, 1982). Completing a te reo Māori (Level 5) qualification has reinforced her constructivist approach with another base of evidence for her social and holistic facilitation style.

A narrative enquiry approach to research based in constructivism is a commonality among her learners. This approach centres on weaving together prior knowledge and new knowledge in relation to place, community, past and future. This supports a learner-centric practice that welcomes different perspectives and recognises whakapapa. It also supports CoPs that invite people to bring their whole selves into their learning environment. This approach recognises Mason Durie's (1998) Te Whare Tapa Whā model of Māori health which includes the spiritual, the mental/emotional, the physical and the social aspects of every participant's life. CoPs provide a richness and exchange that raises the repertoire of the entire group as explored in a series of narratives (Henry et al., 2020).

2. What does constructivist theory and reflective practice mean to you as a teacher?

In Alexa's practice, constructivism and reflective practice mean a genuine acceptance of and respect for the learner's own contextual and cultural position, including ways of knowing and thinking that may be different from or challenge her own. She is committed to honouring Te Tiriti o Waitangi, which manifests as ongoing Māori studies and challenging existing learning design. Her open facilitation style recognises that curriculum reinforces culture (Stucki, 2012) and supports the forming and unforming of CoPs as needed. She recognises everyone as expert in their own learning, which in practice means that everyone in the learning space is a learner with something to offer and something to receive. Her practice welcomes a Māori approach, with its concepts of ako and tuakana-teina and a recognition of the importance of whanaungatanga and manaaki, as well as other integral Māori concepts.

The whakapapa of all things continues to be a big learning area for Alexa, which she explores without wishing to appropriate. She does, however, encourage learners to explore the whakapapa of their thinking as they explore literature and evidence.

Jeremy has already established the importance of scaffolding and the ZPD for his teaching practice; it was also helpful to consider the impact that these frameworks have had on his learners. In the context of Jeremy's facilitation role, it is helpful to consider the difference between scaffolding and just general help. For example, in Jeremy's domain, a common situation occurs when a learner is unable to write from a reflective standpoint. Here, Jeremy 'helps' by providing the learner with a reflective approach as offered by Ker (2017). Alternatively, he most often will 'scaffold' his approach and help the learner to think about what constitutes reflective writing; this is achieved through encouraging learners to think about what reflective writing should look like and how reflective writing could be demonstrated in a learning task, most often through some form of modelling. The key benefit to leaners from receiving scaffolding, as compared to just general help, is that this approach is aimed at helping learners to tackle future tasks in different contexts. If scaffolding is delivered effectively, learners gain autonomy and agency and feel better equipped to tackle more challenging tasks (Hammond & Gibbons, 1995).

Elise, working in IT, uses constructivism to overcome the challenge of integrating soft skills – such as teamwork, communication and time management – into a technical programme where learner buy-in was low. Several iterations of a professional practice course led to the increasing use of experiential learning models (Kolb, 1984), to imitate workflows from industry, for example, applying technical skills in a team setting – the opposite to her previous strategy of applying soft skills in a technical setting. This approach could even be thought of as a form of internal 'work-based learning.' Suddenly, learners realise the importance of soft skills to their technical productivity and are more engaged.

In this work-based-like format ("Studio"), learners make mistakes in their group work which they self-identify, using reflective practice, as coming from a lack of soft skills; thus, they have more engagement with coaching in those skills. In order to imitate 'realistic' workflows when learners may have only been learning technical skills for a matter of weeks, it is important to calibrate the technical aspect of the work so that they make mistakes that they can learn from with effective coaching – the teacher must control for learner frustration (Wood et al., 1976). The calibration of project requirements for each year level is central to this scaffolding approach. A side-effect of the teamwork approach was that learners made marked progress in their technical proficiency, because team members would solve problems using their collective knowledge, passing it around the team in the process (Vygotsky, 1978).

Shannon's aim is to create opportunities for prospective parents to explore their current knowledge and pre-conceived feelings and attitudes about specific childbirth and parenting topics. She encourages them to be actively engaged in the construction of new knowledge by applying their understanding to new situations, and/or combining their understanding with other concepts they have learned, through interacting with a group of individuals currently experiencing a similar journey. As a result, experiential learning opportunities feature strongly in her antenatal teaching repertoire. Experiential education first immerses learners in an experience and then encourages reflection about that experience in order to develop new skills, new attitudes, or new ways of thinking. John Dewey (1963), one of the most significant educational thinkers of his era and the most famous proponent of experiential education, asserted that for learners to be invested in what they are learning, the content should be relevant to their lives.

In Shannon's eyes, this is one of the main benefits of experiential learning – its ability to create 'relevance' for her learners. Shannon says:

> Unlike traditional teaching and learning methods that focus on 'information transmission to passive learners,' utilising constructivist methods, such as experiential learning, creates the opportunity for emotional connection through carefully chosen activities. This is important to me, as when my learners are genuinely interested in the content I am encouraging them to explore, and they can see the relevance of it to their own lives and how it will benefit them, then they emotionally engage and invest, and that is when true learning happens.

Cushla's professional practice is grounded in practical, experiential learning, and it is in this context that both constructivism and reflective practice resonate with her. In the professional practice qualifications that she facilitates, learners undertake problem-based learning through either addressing an issue or improving performance within the work environment. Constructivism suggests cognitive processes that involve the testing of ideas against prior knowledge and experience, and the integration of new learning with pre-existing constructs (Cripps & McGilchrist, 1999, p. 47, as cited in Schofield, 2000, p. 2). Constructivism is enacted in the professional practice programmes, where learners make the connection from current practice to the next steps; in this way, the building blocks of constructivism theory are enacted. It is the language of Rolfe et al. (2001, as cited by the University of Cumbria) that Cushla introduces to her learners and uses with them in order to support the development of their reflective practice, closing the gap between theory and practice. What? So what? Now what? These questions prompt reflective and evaluative discussions of both organisational and learner performance.

As described by Rodgers (2002), critical reflection is a meaning-making process that moves a learner from one experience into another with a deeper understanding and a connection to other experiences and ideas. Rodgers further notes that reflection requires an attitude that values personal (and professional) growth – an attitude that is transformational for learners enrolling in the Capable NZ professional practice programmes.

3. What constructivist pedagogical practices are most effective in engaging student learning over a range of teaching subjects?

Stucki's (2012) weaving of relationships between learner-facilitator, learner-peers and learner-facilitator-peers, and creating a safe social space, is vital to constructivism in the Aotearoa New Zealand context. Alexa sees her role as facilitator as developing relationships and creating a safe place for people to interact and construct their narratives from their own cultural context.

Creating this constructivist learning environment on-line has its challenges, requiring a mind shift and use of tools to build relationships while accepting the constraints of those platforms. In practice, this plays out in ako groups and CoPs through special classes, vertical integration and small groups. Communities are formed and unformed as needed and are built according to need. When in place, rich conversations are achieved by a process of first checking in with learners to ensure that they can be fully present in the time together, and then asking everyone to clarify where they are in their learning process. This in turn leads to questions, topics and the emergence of discussions that are always relevant. Breakout rooms are employed, deep levels of listening are encouraged (Presencing Institute, n.d.–a), and groups report back on what they have heard (as opposed to what they think). This process allows a "leading from the future as it emerges" (Presencing Institute, n.d.–b) and values all contributions, offered from all perspectives and any level of learning.

Bruner (1966) states that a constructivist approach to instruction addresses a predisposition to learning pathways in which a body of knowledge can be structured so it may be grasped by a learner and in the most effective sequence in which to present material. Adult learners bring individual needs, motivations and goals to their learning. Cushla develops trust with her learners, listening to understand their aspirations and learning styles, providing a collaborative and facilitated approach for each learner where they can explore and find their own unique professional identity. A facilitator has many roles – coach, cheerleader and supervisor. The challenge is to understand when to be what (Ker, 2017); using these roles, Cushla assists the learners to attach new knowledge and advances to their framework of practice and supporting constructs.

In Elise's teaching practice and course design for the Studio courses in the Bachelor of IT, scaffolding is employed in the progression from Studio 1 (first semester) through to Studio 6 in the last semester of the degree. In Studio 1, most of the 16 weeks are teacher-directed learning, with formal instruction in technical workflow and soft skills. These skills are put into practice in a team project spanning the last quarter of the semester, in which learners are coached in the application of their skills in a work-based-like environment. In Studio 2, the proportion changes, with the coached project taking up nearly half of the semester. By now, support from the teacher can start to be gradually removed as the proportion of directed learning reduces and team project work increases. In Studio 3, learners continue to work on the same project, brought forward in order to minimise the technical "cognitive overhead," while they build yet new workflows into their practice. Learners are then ready to embark on a more technical project because they have been learning skills in their programming courses. This project is continued in Studio 4, where the final skills are layered onto previous learning. With this carefully scaffolded progression, layering soft skills and workflows onto increasingly technical project work and gradually reducing the teacher-directed portion of the semester, learners should be ready for their independent capstone project in Studios 5 and 6.

As a kinaesthetic learner herself, and an advocate for constructivist methods in adult education, Shannon highly values the "learning by doing" approach that experiential learning activities embrace. However, she claims that in

order to unlock the true potential of these learning methods, the foundations need to be laid beforehand to create an environment where learners feel comfortable enough to share their ideas during these activities:

> I place great emphasis on helping learners feel at ease in my classrooms through getting to know my class members, both before the class has even started and during, by highlighting shared interests and experiences between fellow learners, incorporating humour, bringing a positive energy, by calming the over-sharers and encouraging the quieter class members, by reducing all forms of judgment, and creating a sense of empathy and trust among classmates. I see relationships and connections as key to the success of constructivist methods.

Within the different programmes that Jeremy facilitates on for Capable NZ, he has reflected on the following practices as being highly effective with learners, regardless of the subject:

- Identifying what the learner already knows. This means getting learners to be willing to contribute to a negotiated learning experience and to become more comfortable sharing their previous experiences.

- Breaking up large tasks into smaller steps. Learners may often have difficulties remembering all the steps that they need to follow, so breaking up a large task into smaller steps can help learners get over the fear of starting a task and in due course to become more competent in their domain of practice.

- Modelling the expected output. Learners can often struggle to visualise what a successful learning task should look like, so on receiving an initial draft, Jeremy will often share with his learners sections of an exemplar, so that learners can understand what was missing in their own work and be in a better position to complete future tasks.

One of the most obvious challenges associated with a scaffolding approach is the need for trust to be formed early on in the relationship. Without having trust in the relationship, scaffolding is less likely to be successful (Hoy, 2002). Trust does not happen overnight, but as Daloz (1986) argues, for an educator to be effective a caring stance needs to be taken to build a bridge between what is known and what is still required to be learned. An additional challenge to be considered is that every learner is different, and this means a dynamic approach towards scaffolding should be considered, which in turn means making ongoing adjustments in a facilitator's approach. Developing such an approach takes time, but it will almost certainly lead to improved outcomes.

DISCUSSION AND SUMMARY

Employing a social constructivist, autoethnographic approach to reflect on current pedagogy, our CoP investigated (i) which constructivist theories and models inform practice, (ii) what they mean to our educators and (iii) what are the most effective pedagogical practices to engage learners.

Commonalities in evidence-based (Cullen et al., 2017) pedagogy, using constructivist theories and models, included scaffolding learners for skill acquisition using a socially and culturally sensitive Te Whare Tapa Whā framework. Educators employed a learner-centred approach, working in the ZPD (Vygotsky, 1978) to extend learners into previously unexplored learning by building on previous knowledge. Experiential learning cycles were employed, in a social, contextualised, problem-solving 'studio' or CoP environment, providing a richness of exchange and raising the repertoire of the entire group through cycles of doing and reflecting, making mistakes and refinement. This enabled learners to take ownership of their learning.

Educators found constructivism meaningful, as it enabled learners to test thoughts and ideas against prior knowledge and to make connections from current practice to build new knowledge in a problem-based learning environment,

as proposed by Piaget (1971) for cognitive constructivism. Exploring current knowledge, with pre-conceived ideas and through social engagement and emotional connection, enabled learners to construct new knowledge for new situations, providing significantly greater progress in technical proficiency by using collective knowledge passed within the group. Integrating soft skills, respecting the contribution of the learner's knowledge and cultural position, integrating ako and tuakana-teina models, all while scaffolding learners through their ZPD, were other benefits of social constructivism, as proposed by Vygotsky (1978). Closing the gap between theory and practice, such as using the "What? So what? Now what?" model to develop critical reflection and transformative learning (Mezirow, 1991), was also seen as beneficial to a constructivist pedagogy.

Tools pivotal to constructivist pedagogy which were used to unlock learner potential included the development of trust, to create a safe, supportive learning environment; building a bridge and a relationship with the learner; and sharing interests and experiences to determine what is known and what is still required to be learnt. While Kok (2008) has discussed "Moodle" as a social constructivist tool, our CoP found that the use of humour, positive energy, being dynamic, breaking up tasks into small chunks, modelling exemplars, coaching, moving from a teacher-centred to a learner-centred pedagogy, using on-line breakout rooms, listening and reporting back to groups in a work-based, andragogical, learning environment all enable constructivist pedagogy and promote learner empowerment.

In conclusion, OP teachers have employed a pedagogy reflective of the constructivist continuum from cognitive to social constructivist strategies. This has involved moving from teacher-centred to student-centred learning, where students are supported and develop meaningful ako-based relationships with their teacher. In this safe, inclusive environment, students can be scaffolded along a contextualised, situated cognitive (Brown, et al., 1989), real-life, problem-solving pathway that allows them to make mental and emotional connections, to integrate theory with practice, to move out of their comfort zone, to reflect, to transform and, through social interaction, to gain collective wisdom from their peers. Constructivism provides the vehicle for learner empowerment.

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