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**Designing authentic online
community of learning experiences
for higher education**

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Declaration

I declare that this thesis is my own account of my research and contains as its main content work, which has not previously been submitted for a degree at any tertiary education institution.

Preface

Imagine this; you live in a regional town, kilometres away from the nearest university. You have spent the last three years studying your degree online and not once during this time have you actually spoken to any of your lecturers or fellow students. In your final unit your lecturer provides you with access to new communication technologies and actively encourages you to share your ideas with your peers. How would you feel?

This is a true story and on hearing my voice this student exclaimed, “Wow, there are people out there I’m not in a bubble”. This comment ignited a passion in me to try to improve the quality of online learning for university students.

The authentic learning approach resonated with my own philosophy of online learning and prompted me to explore this approach in more depth. Discussions with my peers revealed that many higher education practitioners wanted to make their courses more interactive and engaging but felt they lacked the knowledge, skills, time and encouragement to do so.

This thesis investigates how authentic learning pedagogical strategies, supported by new technologies and open access to the vast array of available online educational materials, can assist higher education students to engage in an online community of learning.

Abstract

A key challenge for university professionals is to identify how to construct more interactive, engaging and student-centred environments that promote key learning skills and encourage self-directed learning. The purpose of this study was to investigate the effectiveness of an online professional development course that would enable higher education practitioners to design more interactive and engaging online courses.

An extensive review of the literature identified principles of online learning that informed the development of an *authentic community of learning framework* that was used to guide the design and implementation of the professional development course. Key principles encompassed in the framework include: 21st century learning skills, authentic learning elements, Community of Inquiry components—social, cognitive and teaching presence, meaningful learning with technology and using open educational resources. The learning environment comprised a Moodle learning management system (LMS) and an open Google Sites website.

Specifically, the research sought to investigate which elements of the framework higher educational practitioners found to be most effective in helping create an interactive and engaging online learning experience, and whether the *authentic community of learning framework* influenced their existing teaching practices.

The study employed a design-based research approach in the form of an interpretive, qualitative study. Data collection methods included surveys, participant artefacts, contributions to forums, blog reflections and interviews with selected participants. Data was coded and analysed using a constant comparative method of analysis.

Findings suggest that the *authentic community of learning framework* was a successful alternative to models frequently used to develop online professional development courses and provided learners with greater flexibility and control over their learning. Participants themselves believed that the online course influenced their choice of strategy when designing their future online courses.

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CHAPTER 1

Introduction

It has long been known that people learn better when they are actively involved in the learning process (Brown, Collins & Duguid, 1989; Doering, Veletsianos & Scharber, 2009; Lave & Wenger, 1991; Schank, Berman & Macpherson, 1999; Vygotsky, 1978) and over the past few decades there has been a substantial swing among educational theorists and practitioners towards a more constructivist approach to learning (Jonassen & Reeves, 1996; Klobas & McGill, 2010; Moreillon, 2015; Von Glasersfeld, 1990). However, for those who wish to adopt a more constructivist approach, there is still a significant gap between the constructivist philosophy of online teaching and its translation into practice (Koh, Chai, Wong & Hong, 2015; Lambert & Cuper, 2008; Maor, 2003a; Oliver, 2005).

Lack of online pedagogical and technological skills and knowledge has caused many teachers to simply dump large tracts of information into online courses (Lambert & Cuper, 2008; Maor, 2003a; Rotherham & Willingham, 2010; Weigel, 2005). This has led to student boredom and isolation (McCombs, & Vakili, 2005), resulting in high dropout rates and pleas for richer and more engaging learning experiences (Kim & Bonk, 2006; Maor & Volet, 2007b).

As content is now abundant and easily accessible via the Internet, an information delivery approach is no longer appropriate for educating students in our “increasingly global and complex world” (McCombs & Vakili, 2005, p. 1). A more student-centred learning approach that includes pedagogical techniques such as online collaboration, case-based and problem based learning (Kim & Bonk, 2006) can help learners develop critical 21st century skills and better prepare them for the global workforce (Partnership for 21st Century Skills, 2010).

Due to globalisation, the changing economy and the rapid growth of online education many educators believe providing quality online programs is imperative for higher education institutions (Barczyk, Buckenmeyer & Feldman, 2010; Brown & Adler, 2008; Kim & Bonk, 2006). Bonk suggests, “after suffering through a decade of drought-like conditions in the area of online pedagogy many online instructors have a *thirst* for innovative and engaging instructional activities” (2004, p. 3). Although linking technology, learner needs, pedagogy and institutional budget restraints has created the *perfect e-storm* for creating effective online learning environments (Bonk, 2004).

Bonk describes the perfect e-storm as the convergence of four key elements: emerging technologies, learner needs, effective pedagogy and budget restraints. However, there is little empirical evidence to guide instructors on how to use emerging technologies effectively in online environments (Grant, 2011; Kim & Bonk, 2006; Selwyn, 2011). To meet current 21st century learner needs, institutions need to assist educators to learn how to implement student-centred methods to effectively engage online learners (Bonk, 2004). The recent financial crisis has seen a number of cutbacks introduced to higher education funding that will be both a threat and an opportunity for online learning. Monetary constraints may require educators to adopt innovative ways for providing low cost education, which may see online learning take centre stage (Allen & Seaman, 2011).

Educators who follow a constructivist philosophy believe online learning is more than just the delivery of information—it is about communication, collaboration, performance support and knowledge sharing. It is a complex mix of physical cognitive and social technologies, applications, activities and presentations, combined with a range of services that help to support the entire online learning experience (Knight, 2002; Lane, 2008; Maor, 2003a; Woodill, 2007).

Existing research indicates pedagogical strategies that include real-life tasks (Boyaci, 2006; Bozalek et al., 2013; Herrington, Reeves & Oliver, 2010) supported new technologies and access to the vast array of online open educational resources (Bozalek et al., 2013; Crawford-Ferre & Wiest, 2012) have the potential to improve the quality of online learning. Studies have shown that providing teachers with quality training on how to teach online increases teacher confidence and readiness that translates into a better learning experience for students and teachers (Green, 2012).

This research study was undertaken to investigate current online learning approaches and to identify possible solutions for encouraging higher education practitioners to develop more student-centred, interactive and engaging learning environments. A four-phase design-based research approach was employed for this study (Reeves, 2006a). Design-based research is a research approach that is frequently used in education—particularly to investigate innovation using technology-based initiatives in classrooms—because it, “embraces the complexity of learning and teaching and adopts interventionist and iterative posture towards it” (Kelly, 2004, p. 105). The design-based research model used for this study is described in detail in Chapter 3.

Consultation with practitioners

An important aspect of design-based research is collaborating with practitioners, “in the identification of real teaching and learning problems” (Reeves, 2006a, p. 59). Ideally, in education, it should involve both teachers and learners in the creation, testing and refinement of both prototype solutions and design principles to develop robust design models and principles. Subsequently informal face-to-face discussions were conducted with university lecturers currently involved in designing and implementing online higher education courses delivered through a learning management system (LMS).

These informal conversations gathered information about the lecturers’ experiences and provided anecdotal evidence of some of the obstacles and possible solutions involved in designing and implementing effective online higher education courses that are based on a social constructivist model of learning.

The discussions revealed practitioners wanted to create more interactive and engaging online courses. However, they faced a range of issues that hindered their adoption of constructivist learning approaches. These issues included lack of: learner autonomy, time, practitioner knowledge about online learning design strategies, pedagogical competency and technical skills, access to knowledge on the Internet, flexibility in the learning management system (LMS), practitioner experience in an online learning environment and limited professional development.

The salient issues and suggestions identified by the practitioners included:

- *Quality of online courses:* The current quality of online learning needs to be improved and, in their view, student demand would push some major changes in this area in the near future.
- *Professional development:* Most indicated professional development opportunities provided by their institutions were generally good for learning how to use the LMS and associated technologies. However, there were few opportunities to learn about online pedagogies or how new technologies could be used to achieve the desired learning outcomes or training on instructional design strategies.
- *Design and implementation issues:* Concerns with designing and implementing online learning included: LMS constrictions, interface design issues, working with unit coordinators with different ideas, students not reading instructions and difficulties with educating students to take more responsibility for their learning.

-
- *Technology*: Learning about new technologies was high on most lecturers' agenda but time to explore and attend training was an inhibiting factor.
 - *Opportunities to engage with content and peers*: All practitioners felt student interaction and participation is essential to assist learning. However, some thought contributions to the discussions must be assessable otherwise students would not participate.
 - *Access to content*: Most thought both students and lecturers needed better access to more flexible learning options and resources.
 - *Faculty support*: Some felt lack of recognition and time for designing and delivering quality online teaching was very frustrating.
 - *Peer support network*: Others indicated there were limited opportunities and encouragement for working with peers to improve the quality of their teaching.

The aim of this research was to help improve the quality of online learning by encouraging the uptake of constructivist e-learning approaches within higher education. One potential solution to address many of the above issues would be to design professional development opportunities that focus on online pedagogical and technological strategies.

The research approach and research questions

The purpose of this research was to determine the effectiveness of an online professional development course for higher education practitioners based on an authentic online learning framework. The course was delivered using a learning management system (LMS) and an open public website. Participant learning was supported using new technologies and a variety of open educational resources (OERs). The research was designed to be conducted in four interrelated phases based on Reeves (2006a) design-based research model.

Phase 1: Analysis of the problem

Phase 1 included an in-depth review of the existing literature, consultations with practitioners in the field, identification of the proposed intervention, selection of an appropriate research methodology and the development of the research questions. The study was guided by an overall research question and two secondary questions.

Research question:

Can immersing higher education practitioners in an authentic learning environment assist them to create more interactive and engaging online learning experiences within a learning management system?

Secondary research questions:

1. In what ways do the components of social, cognitive and teaching presence facilitate the design and delivery of authentic online courses within higher education?
2. How effective is an authentic online learning framework in encouraging practitioners to implement new pedagogies and technologies within their own online courses?

Phase 2: Development of solutions

During Phase 2, the proposed solution—an online professional development course for higher education practitioners—was designed and developed based on draft design principles that emerged from the literature review and the consultations with practitioners. By the end of this phase, the course was designed and created and was ready for implementation in Phase 3. The aim of the 5-week course was to immerse practitioners in an authentic learning environment so they could experience online learning from a student perspective, learn how to implement the authentic online learning framework, explore and use new technologies and network with other practitioners.

Phase 3: Iterative cycles of testing and refinement

In Phase 3, the initial course was implemented and evaluated and recommendations for improvement were identified. Based on the recommendations, the course was modified, and two further iterations were implemented and evaluated using different cohorts of participants.

Phase 4: Design principles

The final phase includes a summary of the research, presentation of recommended design principles and recommendations for further research.

The organisation of the thesis

Following this introductory chapter, a literature review is presented in Chapter 2 that provides a brief summary of current online learning trends within higher education and an analysis of constructivist learning approaches that can help to foster the development of 21st century skills. A critical review of the principle theorists (and critics) of authentic learning is presented. It discusses a range of factors that influence the design and implementation of online learning courses such as: new technologies, designing authentic e-learning environments, educator skills, faculty support, learning management systems (LMS), personal learning environments (PLEs), open network learning environments (ONLEs), open educational resources (OER) and social web technologies. Finally, it explores the components of online presence: social, cognitive and teacher presence, identified in Garrison, Anderson and Archer's (2000) Community of Inquiry (CoI) model and presents a detailed review of articles published about the CoI model and its value as a framework for developing and supporting a community of online learners.

A qualitative educational design-based research approach was selected for this study and a detailed justification for using this approach is described in Chapter 3. The research methodologies used for all phases of the study, the target group and data collection and analysis methods are described, together with the methods used to ensure trustworthiness of the data and findings, ethical considerations and confidentiality.

Chapter 4 describes the draft principles employed to guide the design of the learning environment and the process of designing and developing the online professional development course. Once the learning environment was designed and developed, the course was implemented.

The implementation of three iterations of the course is explained in Chapter 5. It discusses the themes and issues that emerged from analyses of the data and explains how the course was modified before each successive iteration to improve the design.

Chapters 6-9 present the data analysis and discuss the findings to answer the two sub-research questions. Chapter 6 describes the findings for elements related to social presence such as participant interaction, communication and group cohesion. Chapter 7 reports on findings concerned with cognitive presence including: authentic context and tasks, collaborative construction of knowledge, multiple roles and perspectives, expert performances and modelling of processes, reflection, authentic assessment and using technology as cognitive tools.

Evidence for the impact of teaching presence as supporting online learning is presented in Chapter 8. It discusses how the design of the environment, management of learning activities, selection of learning resources, provision of conative support, online facilitation and affordances of technology all play a role in providing effective online learning. The chapter concludes by summarising the findings that address the first sub-research question: *In what ways do the components of social, cognitive and teaching presence facilitate the design and delivery of authentic online courses within higher education?*

In Chapter 9, the analysis and findings related to the second sub-research question are discussed: *How effective is an authentic learning framework in encouraging practitioners to implement new pedagogies and technologies within their own online courses?*

Participant vignettes describe how participants incorporated the course pedagogies and ideas in the design and implementations of their own online courses.

The final chapter presents a summary of the research and describes how the draft framework was refined to produce the final model of the *authentic online community of learning framework*. It also discusses the implications of the research, the limitations of the study and recommendations for further research.

CHAPTER 2

Literature review

During Phase 1 of the design-based research study, a literature review was conducted along with consultations with practitioners to explore the current online learning landscape and to identify reasons for the slow uptake of constructivist approaches in higher education. Consultations with practitioners were described in the previous chapter. This chapter discusses the concepts identified from the literature review.

Research indicates there is a significant gap between preferred constructivist online teaching strategies and actual practice (Lonn & Teasley, 2009). Lack of time, online pedagogical incompetency and lack of technical skills has caused many teachers to simply provide little more than information in online courses, much of which, “has no value in the real world” (Armstrong, 2012, p. 2).

Miller (2000) describes “the four g’s” of an *information industry* model: (1) generate information, (2) gather information, (3) group information and (4) give information to others that could be applied across a broad range of contexts. When educators use an information delivery approach to teaching these four characteristics can be translated to: (1) teachers generate content and decide what is appropriate for learners to know, (2) teachers gather specific resources that are relevant to the content area, (3) teachers group the information into weekly portions or modules and (4) teachers give the information to students where delivery is often the metaphor. A detailed description of each of the characteristics is provided in Appendix 1.

This information delivery model has led to student boredom and isolation (Anderson, 2008b; McCombs & Vakili, 2005; McLoughlin, 2014), resulting in high dropout rates and pleas for richer and more engaging learning experiences (Brown & Hughes, 2014; Kim & Bonk, 2006; Herrington, Reeves, Oliver & Woo, 2004).

A current trend within higher education is to deliver online courses via learning management systems (LMS) (Pugliese, 2012). Many presumed the LMS would act as an agent of pedagogical change to transform passive teacher-centred information delivery models into “broadly accessible student-centred, interactive learning model[s] based around learning networks, interactive and collaborative technologies and communities of practice” (Wise & Quealy, 2006, p. 899). However, this potential has largely not been fulfilled and many

educators believe they are primarily used to manage learners rather than provide quality-learning experiences (Kim & Bonk, 2006; Lonn & Teasley, 2009; Pugliese, 2012).

With the rapid growth of online enrolments (Allen & Seaman, 2011; Brown & Hughes, 2014), many universities acknowledge that online learning is a critical component of their strategic plans (Hixon, Barczyk, Buenmeyer & Feldman, 2011; Kupczynski, Ice, Wiesenmayer & McCluskey, 2010; Pugliese, 2012) and are seeking ways to encourage educators to embrace research-based methods for effective online teaching (Crawford-Ferre & Wiest, 2012). It is proposed that Constructivist-learning theories, are appropriate for 21st century learning, as they are learner-centred and focus on knowledge construction based on learner's previous experience (Cameron & Tanti, 2011; Koohang, Riley & Smith, 2008; Maor, 2008; McLoughlin & Lee, 2008).

21st Century learning

Over the past few decades the computerisation of work has resulted in many jobs becoming much more knowledge intensive. Additionally, the rapid expansion of modern technologies are, "changing the ways we produce, consume, communicate and think" (Collins & Halverson, 2009, p. 5). Just as the industrial revolution radically changed the education system in the 19th century the current knowledge revolution is starting to have a profound impact on the way we learn. People are seeking more control over where they learn, what they learn and how they learn and seek more opportunities to interact with their peers and other supports (Collins & Halverson, 2009).

Dron (2007) believes, "a central goal of education is that learners should be able to learn autonomously - to be in control of their own learning" (2007, p. xiii). He argues most educational systems offer learners too much or too little control and suggests an effective educational system should put the learner in control of the *amount* of autonomy they have over their learning. Some educators have voiced concern that learner autonomy will diminish the teacher's capacity to play a directive role in online dialogue that could lead to a lack of critical engagement with the tutor (Kop, 2008). While others are concerned that students lack the required skills and confidence for independent learning (Lombardi, 2007b; Oomen-Early & Murphy, 2009).

Learner autonomy and control challenges traditional approaches that have evolved over the past 200 years and many universities continue to use traditional teacher-centred information delivery modes (McLoughlin, 2013) that focus on delivering theory via lectures and assessing students through end of semester exams. However, as content is now

abundant and easily accessible via the Internet this approach no longer seems appropriate for educating students in our, “increasingly global, changing and complex world” (McCombs & Vakili, 2005, p. 1).

Many educators believe student-centred constructivist-learning approaches that focus on helping learners to develop critical 21st century skills can better prepare our graduates for the global workforce (Garrison, 2011; Herrington, Parker & Boase-Jelinek, 2014; McLoughlin, 2014; Okada, Rabello & Ferreira, 2014; Rotherham & Willingham, 2010).

21st Century learner needs

To thrive in our emerging global society learners need expert thinking and complex communication skills (NETS for students, 2007). Work readiness is no longer just about teaching reading, writing and arithmetic (3R's). To be successful in the modern workplace, learners need critical life, learning and technology skills (Levin-Goldberg, 2012; Partnership for 21st Century Skills, 2010).

The framework for 21st century learning, illustrated in Figure 1, presents a holistic view of 21st century teaching and learning with a focus on student outcomes and learning support systems that can assist educators to prepare their students for our rapidly changing 21st century global world and beyond (Partnership for 21st Century Skills, n.d.).

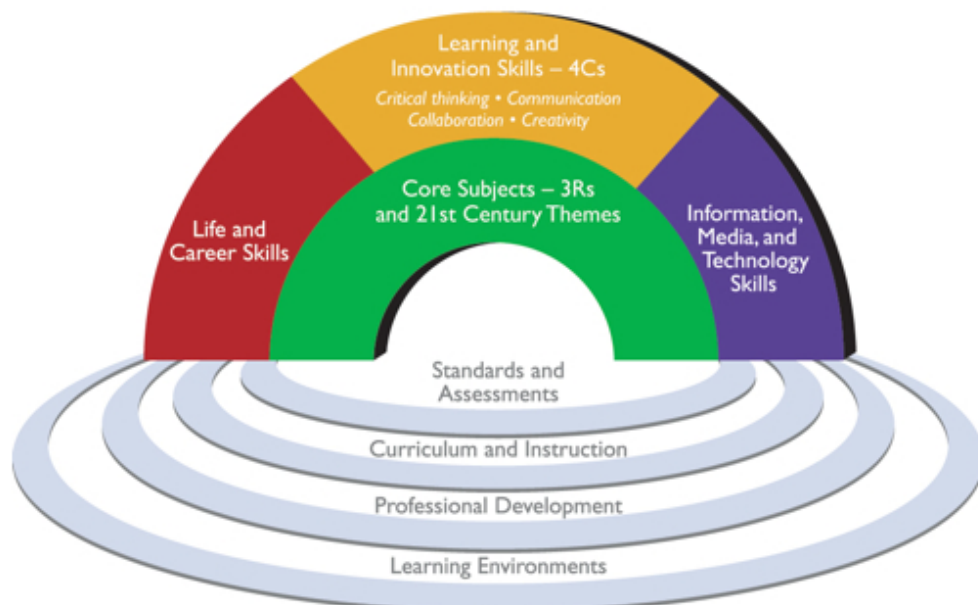


Figure 1: 21st Century student outcomes and support systems
(Partnership for 21st Century Skills, 2010, p. 36)

The framework identifies a broad range of student outcomes that learners need in order to be successful in a rapidly changing world (Appendix 2). If we want our students to gain these skills, we must design authentic tasks and assessments that will enable them to learn and demonstrate these types of outcomes (Herrington et al., 2010; Reeves, 2006b).

Blooms Taxonomy of educational objectives is a popular framework for classifying learning outcomes into three domains of learning: cognitive, affective and psychomotor (Bloom, 1956; Schrire, 2004, Schank, 2011). However, Reeves (2006b) suggests that comprehensive learning outcomes for the 21st century learner should also take into consideration a fourth domain—the conative domain. The conative domain is associated with the mental process of action—the capacity to act, decide and commit (Reeves, 2006b). Huitt and Cain (2005) agree that, “developing knowledge, attitudes and skills associated with conation, specially self-regulated learning skills, will be increasingly important to success as the 21st century continues” (p. 2).

Atman (1987) identified a five -stage taxonomy for the conative domain: perception, focus, engagement, involvement and transcendence. However, a more commonly cited taxonomy described by Snow et al. (1996), uses three levels of classification: 1) action controls, 2) other directed orientation and 3) personal style. The characteristics and sub-categories for each level are provided in Appendix 3.

To promote the development of conation, Lumsden (1994) suggests educators should encourage questioning, exploration and exposure to resources that can enlarge the student’s world to nurture the learner’s feelings of self-worth, competency, autonomy and self-efficacy. Another way that teachers can encourage students to take responsibility for learning is to allow them to engage in interesting activities without formal evaluation (Corno, 1992). Huitt and Cain (2005) believe when learners are, “given the freedom to make choices about their learning, to set individual goals based on a prescribed curriculum and held to standards, children [they] receive intrinsic rewards and become self-regulated learners” (p. 10).

Reeves (2006b) identified a number of meta-outcomes (Appendix 4) for higher order learning that cut across all four domains of learning to assist educators with developing tasks and assessments to meet 21st century learner needs.

Constructivist learning strategies

Constructivists argue that a, “learning environment should engage the learner in terms of four characteristics: context, construction, collaboration and conversation” (Vogt, Maschwitz & Zawacki-Richter, 2010). Therefore, educators who teach from a constructivist perspective

will draw on strategies that foster a learner-centred environment rich in critical thinking, student exploration, reflection and articulation, peer learning, and collaborative knowledge construction (Jonassen, 1994; Meyers, 2006; Weigel, 2005).

There are many constructivist based teaching and learning strategies that educators could use to foster the development of 21st century skills. Carmean and Haefner (2002) suggest rich learning environments that foster meaningful student learning and engagement can be created using a combination of learning management system (LMS) tools and deeper learning principles. They defined deeper learning as, “an engaged learning that results in a meaningful understanding of material and content” (pp. 28-29) and identified five principles (Appendix 5) to describe deeper learning.

Levin-Goldberg (2012) identified three strategies she feels,

best embody a holistic, organic and authentic representation for 21st century work ready preparedness: (a) becoming cognizant and literate in Web 2.0 tools; (b) assigning real world problems and issues for students to resolve using technology; and (c) creating collaborative problem-based learning experiences utilizing the resources availed via the web (p. 3).

These strategies imply that context, real-world tasks, problem-solving and social interaction play an important role in helping learners assimilate new information. Furthermore, emerging cognitive research indicates authentic learning aligns with, “the way the human mind turns information into useful, transferable knowledge” (Lombardi, 2007b, p. 7). They also emphasise students’ use of new technologies such as: information gathering, data collecting, simulations, virtual worlds, creative writing, concept mapping, designing, communicating and collaborating tools (Jonassen, Howland, Marra & Crismond, 2008). Many educators agree that new technologies can play a significant role in supporting student learning if they are used as cognitive tools to assist learning rather than information delivery vehicles (Bonk & Zhang, 2008; Jonassen & Reeves, 1996; Kim & Reeves, 2007).

Student-centred learning approaches that include pedagogical techniques—such as case-based learning and problem based learning (Kim & Bonk, 2006) that require learners to solve real-world problems using new technologies (Herrington et al., 2010) coupled with the affordances of Web 2.0 tools and open access to educational resources (Cormier & Siemens, 2010; Pugliese, 2012)—may provide the opportunity for universities to create engaging learning experiences that replicate realistic workplace environments and foster deeper thinking skills. This type of environment can better enable support for student transition to the 21st century workplace. Real-life learning approaches, also known as authentic learning,

are derived from theories of situated learning and these are described in the following section.

Authentic learning

Brown, Collins and Duguid proposed one of the first models of *situated cognition* in 1989. They defined authentic activities as, “the ordinary practices of the culture” (p. 34) and explained that learners needed to experience the activities and culture of the community in order to build an implicit understanding of how to act effectively within the community. However, this theoretical model appeared to have little impact on educational practices at first, as pointed out by Brown and Duguid (1993), as there were few instructional guidelines to assist teachers to implement the model.

In 1997, Herrington identified nine critical elements of situated learning and developed a model of authentic learning that could be applied to educational practice. The principles of authentic learning include:

- Provide authentic contexts that reflect the way the knowledge will be used in real life
 - Provide authentic activities
 - Provide access to expert performances and the modelling of processes
 - Provide multiple roles and perspectives
 - Support collaborative construction of knowledge
 - Promote reflection to enable abstractions to be formed
 - Promote articulation to enable tacit knowledge to be made explicit
 - Provide coaching and scaffolding by the teacher at critical times
 - Provide for integrated assessment of learning within the tasks
- (Herrington, 1997, pp. 36-38).

Initially, Herrington used the model to design and evaluate multimedia and web-based learning environments. Over the ensuing years, she has refined and applied the model more generically to learning environments within higher education (Herrington, 2006; Herrington, Herrington, Mantei, Olney & Ferry, 2009; Herrington et al., 2010).

Authentic learning is a process involving the dynamic interactions between the learner, the task and the environment. Some educators suggest creating an authentic learning experience requires fostering community partnerships where students can be engaged in real-world activities outside the classroom (Grift, 2009; Warner, Glissmeyer & Gu, 2012). Others

suggest it is more important to engage learners cognitively with a meaningful and realistic scenario than to create an exact replica of a real-life workplace context (Herrington, Reeves & Oliver, 2007; Lombardi, 2007b; Smith, 1987).

Splitter (2009) supports the view that learning does not need to include real work community partnerships to immerse and engage students but suggests that authenticity is only achieved when the learning experience makes sense to the student. Other educators have questioned the effectiveness of authentic learning approaches. For example, Bain (2003) argues that cognitive engagement and external connectedness does not guarantee that students will grasp the underlying principles and concepts of the task and advocates a combination of both instructivist and constructivist approaches. However, many educators believe immersing learners in a cognitive real environment where they are exposed to the complexities of ill-defined real-world problems can provide opportunities for them to learn and practice important 21st century skills (Barton, Mahang & McKellar, 2007; Bozalek et al., 2013; Carter, 2014; Herrington et al., 2010; Keppell, 2006a; Lombardi, 2007b; Morrissey, 2014) such as: judgement, patience, flexibility and the ability to synthesise information, that most learners have difficulty grasping (Lombardi, 2007b).

The most important component of the authentic learning model is the task(s) that learners are required to complete to demonstrate their skills and knowledge. Using the authentic learning model, Herrington and colleagues further explored authentic learning activities and identified ten pedagogical elements (Appendix 6) that could be used as a framework for designing and assessing authentic learning tasks (Herrington, 2006).

Engaging students in authentic tasks can also encourage confidence and cultivate self-directed learning (Herrington, 2006). Therefore, the more students that are exposed to authentic communities of learning the better prepared they are to deal with the uncertainty and *messiness* of real-life decision-making (Lombardi, 2007b) required in our rapidly changing global economy. Koohang (2008) advocates that learners be presented with a task that reflects a real-world situation that they first explore on their own and reflect on before working in small groups. Working individually, they apply their own experience and knowledge to the task and reflect on what they have learnt. After which, working in small groups, they are encouraged to collaboratively construct knowledge, view multiple perspectives and engage in social negotiation about the concepts, ideas and content covered.

Social interaction is a vital component of real-world learning and online discussions, and collaborative technologies can facilitate interaction and the development of a community of learners (Stewart, Bachman & Babb, 2009). The increasing availability of social web

technologies provides the opportunity for educators to offer students a more interactive and engaging learning experience (Hodges & Repman, 2011; Lombardi, 2007b). But if educators ignore the potential of the Internet and affordances of new technologies (Herrington et al., 2004) they will fail to meet the needs of 21st century learners. Some of the affordances of the Internet and new technologies are discussed in the following section.

New technologies

New technologies are transforming every aspect of work. Today reading and interacting with the web using a range of technologies—such as emails, spread sheets, word processing, presentations and digital videos—are routine, everyday tasks in modern workplaces (Collins & Halverson, 2009). Using web-based applications to create life-like situations (Lombardi, 2007b), students can work together on group projects in the classroom or access relevant content online at a time and place of their choice to apply the knowledge and perform the skills they are learning at university.

Prior to the introduction of Web 2.0, Internet users could only view web pages, not contribute to them. Tim O'Reilly, the person credited for popularising the term *Web.2.0* described it as, “the idea that the internet is on the verge of replacing the personal computer as the dominant computing platform” (O'Reilly, 2006, para. 7). He explained “the real heart of Web 2.0 is harnessing collective intelligence” (para. 28) and that a true Web 2.0 application, “gets better the more people use it” (para. 27). Research indicates Web 2.0 technologies and other social online tools that enable people to communicate and collaborate have the potential to improve student engagement and knowledge construction (Anderson, 2008b; Kop, 2010; Lombardi, 2007b; McLoughlin, 2014) as they provide avenues for creativity and foster inclusion of 21st century skills (Lambert & Cuper, 2008; McLoughlin & Lee, 2008).

Tim Berners-Lee (1998) stated, “the dream behind the Web is of a common information space in which we communicate by sharing information” (para. 3). Today his dream is a reality. The second part of his dream was that the web, “became a realistic mirror of the ways in which we work and play and socialize” (para. 3). This is also becoming a reality as Web 2.0 has changed the way people use the web and new technologies have made it possible for anyone to publish whatever they like on it (Baltzersen, 2010).

Many educators believe Web 2.0 technologies have the potential to revolutionise the education sector. Some believe it will move from a hierarchical teaching approach to a more socially networked approach (Cormier & Siemens, 2010; Downes, 2006), while others

believe it will be largely machine-guided involving highly sophisticated, interactive technologies that incorporate forms of artificial intelligence (Bacow, Bowen, Guthrie, Lack & Long, 2012).

The literature suggests that environments that make effective use of communication technologies to connect learners in meaningful ways and include relevant learning activities are the most successful (Armstrong, 2012; Johnson & Aragon, 2003; Lombardi, 2007a; Thalheimer, 2010; Wiggins, 2009). As, “pedagogy and software design are closely intertwined in online learning - the ‘shape’ of the software can help or hinder the teacher in what they are trying to do” (Pedagogy, 2010, p. 1). Therefore, the design of the learning environment plays an important role in successful online learning.

Designing authentic e-learning environments

Jonassen (1994) explains, “constructivists emphasize the design of the learning environment rather than the instructional sequence” (p. 35). Authentic learning environments are not content driven. Rather, they are process driven and require students to complete complex real-world tasks over a period of time in collaboration with others as they would in a real setting or workplace (Herrington, 2006). In an authentic learning environment, the central element in the design of the learning environment is the task students are required to perform (Herrington, Reeves, et al., 2004).

The major challenge for instructional designers and practitioners for implementing authentic online learning is aligning the critical components of authentic tasks with effective learning principles (Herrington, Reeves et al., 2007). Other challenges for higher education are: the difficulty in determining how authentic learning theories and characteristics can be implemented effectively within rigid learning management systems (Agostinho, Meek & Herrington, 2005; Lane, 2009; Weaver, Robbie & Borland, 2008) and how to provide support to teachers to assist them to use and implement new technologies (Allen & Seaman, 2011; Oliver, 2005). Designing, developing and delivering activity-based courses requires more thought, effort and time than content-based courses (Lane, 2008) and is often a *labour of love* by educators keen to improve student learning based on recent research findings and the affordances of new technologies (Weaver et al., 2008).

Reeves, Herrington and Oliver (2005) call for more design-based research studies to expand our knowledge in the field of authentic learning and design principles. They believe a more rigorous, systematic and analytical approach can inform educational theory and practice and encourage more online educators to embrace this real-life learning approach. Maor (2003b)

suggests immersing practitioners in the theoretical environment they are learning about has the potential to improve educator skills (as discussed in the next section) and to change existing online teaching practices.

Educator skills

In the past, good teaching was a combination of in-depth subject knowledge (content) and a clear understanding of how it should be taught (pedagogy). Today, rapid advances in information and communication technology (ICT) is transforming teaching (Australian Government Department of Education Employment and Workplace Relations (DEEWR), 2011) and now, “good teaching requires an understanding of how technology relates to the pedagogy and content” (Mishra & Koehler, 2006, p. 1026). Mott and Wiley believe a significant aspect of being an accomplished teacher is the ability to leverage the best tools, technologies and learning environments available to support specific teaching and learning situations (2009). This presents new pedagogical and technological challenges for higher education professionals (Gregory & Salmon, 2013; Kim & Bonk, 2006).

In order to create quality online learning experiences, online educators need to have good technological, pedagogical and content knowledge—known as TPACK (Figure 2) (Mishra & Koehler, 2006) as well as good planning, management and moderating skills (Bonk, Kirkley, Hara & Dennen, 2001; Kim & Bonk, 2006; Maor, 2003b). Social interaction, communication and collaboration are critical factors for effective online learning within a social constructivist, learner-centred environment (Muirhead, 2004; Stewart et al., 2009). Therefore, online educators also require the skills and knowledge to manage the social, cognitive and teaching processes (Garrison et al., 2000; Gregory & Salmon, 2013) and to develop strategies to monitor, guide and nurture the online community (Maor, 2007).

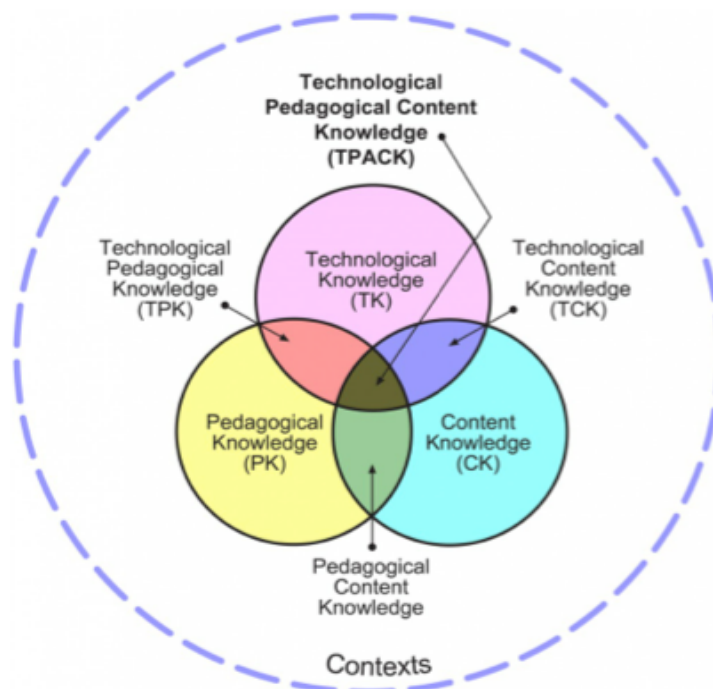


Figure 2: TPACK - technological, pedagogical and content knowledge
(Mishra & Koehler, 2006).

Online teaching is not a simple task for most educators (Bonk et al., 2001; Omar, Kalulu & Alijani, 2011) and many faculty members earned their degrees in an era that used more traditional technologies such as projectors, chalkboards and emails. Therefore, it is not surprising that educators lack the knowledge, skills and confidence to integrate technology effectively into their online courses (Koehler & Mishra, 2009).

Whetten (2007) noted, “that the most effective teachers focus their attention on course design” (p. 341). However, to design, deliver and maintain high quality online learning, higher education educators need pedagogical and technological training (Baily & Card, 2009; Oomen-Early & Murphy, 2009; Salmon, 2011). Professional development can assist educators to learn how to adapt their teaching methods to engage with their digitally connected students (Morrison, 2012) and to keep abreast of technologies, pedagogies and the latest thinking on social and psychological factors that influence online learning (Omar et al., 2011).

Online teaching is a complex and demanding job and, “the commitment of faculty to online education is valuable to educational institutions” (Bolliger & Wasilik, 2009, p. 104). In this sense, faculty support is also an essential ingredient for developing effective online learning.

Faculty support

Many universities support online educators by providing professional development (PD) opportunities for improving online teaching knowledge and skills and implementing strategies for recognition of good quality teaching (Allen & Seaman, 2011; Chalmers, 2011). Although, some argue that existing online PD courses do not typically embrace constructivist based learning pedagogies (Maor & Volet, 2007b; Morrison, 2012; Oomen-Early & Murphy, 2009) and that many educators do not perceive good teaching as adequately rewarded (Armstrong, 2012; Chalmers, 2011; Hardre & Cox, 2009).

Professional development courses for higher education practitioners often focus on the technical *nuts and bolts* aspects of how to use a specific tool or feature (Oomen-Early & Murphy, 2009), for example: how to upload a unit outline, create a discussion forum or use the grade book for a specific LMS. However, educators also need to learn how to adapt their teaching methods and pedagogies to create interactive and engaging online environments (Oomen-Early & Murphy, 2009). Research suggests teachers need to experience new learning environments and pedagogies as learners themselves in order to implement changes to their teaching approach (Gregory & Salmon, 2013; Maor, 1999; McLoughlin & Maor, 2005). Courses that offer both technical and pedagogical training can assist educators to understand how technology can be used to support interaction, communication and collaboration between students and teachers (Morrison, 2012).

Weaver et al., (2008) suggests that successful institution-wide professional development (PD) requires three critical components: (1) full and open support of the institution, (2) delivery by supportive staff with recognised expertise and credibility in online teaching, and (3) a flexible and varied PD program (p. 772).

The most common training approaches for PD courses are internal workshops (Allen & Seaman, 2011), usually face-to face workshops conducted in a computer lab supported by print and online resources, although the rise in online educational offerings has contributed to a growing interest in developing online PD courses. Despite more flexible PD options, an ongoing dilemma for effective university professional development is lack of participation and high attrition rates (Bolliger & Wasilik, 2009; Maor & Volet, 2007b; Oomen-Early & Murphy, 2009).

Participation in programs for improving online teaching practises is often voluntary resulting in poor attendance in most courses with the bulk of attendees comprising staff who are genuinely interested in online learning and are willing to sacrifice their own time and resources to achieve their learning goals (McLoughlin & Maor, 2005; Weaver et al., 2008).

According to Maor and Volet (2007a), high dropout rates in online professional development courses is common and attrition rates can vary from as low as 13.5% to as high as 75%. Factors such as motivation, readiness to study, technical skills and lack of time due to workloads or family commitments are commonly cited reasons for non-completion.

It appears PD is greatly valued by academics although attending PD is a serious challenge for some, particularly part-time and contract staff, and many consider it, “to be a hurdle that is undertaken on top of other competing demands on their time” (Chalmers, 2011, p. 30). Research indicates high workload is one of the greatest barriers for educators attending and participating in PD opportunities. Therefore, one way faculty could support educators is to provide release time for professional development (Bolliger & Wasilik, 2009; Oomen-Early & Murphy, 2009).

Another way faculties support educators is by implementing strategies for recognising the scholarship of teaching. During recent years a, “number of national initiatives, with significant funding, have been attempted to redress the imbalance between teaching and research and to focus university leaders’ attention on the quality of teaching and learning and the underlying systems and processes that support it.” (Chalmers, 2011, p. 26). Initiatives include: national student surveys implemented by the Australian Government in the mid-1990s, the Australian Awards for University Teaching in 1997, The Learning and Teaching Fund (LTPD) scheme in 2003 and the Australian Learning and Teaching Council (ALTC) in 2004. The aim of these initiatives was to promote teaching quality within Australian higher education sector. The most common strategies for recognising quality teaching are: annual awards for teaching excellence, professional development opportunities and grants, and more focus on teaching criteria for staff performance review and promotion (Chalmers, 2011).

Student evaluations of teachers are commonly used to determine teacher performance and contribute to faculty promotions and teaching awards. However, Armstrong (2012) reported many teachers found them demeaning and he questioned the value of student evaluations as he believes, “students have little knowledge of the material or of how people learn” (p. 3). Many educators do not perceive awards as highly valuable because the application process requires a great deal of effort, the criteria and decision-making process is not transparent and the one-off reward can often only be spent on ‘approved’ activities (Chalmers, 2011). Chalmers suggests a more appropriate way of recognising and rewarding teaching would be to offer academics an ongoing salary increment.

PD opportunities are also used by universities as a reward strategy to recognise teaching excellence, although a significant number of academics do not consider PD to be a reward as it is often regarded as part of the institution's commitment to supporting and assessing quality teaching (Chalmers, 2011). Despite the efforts of institutions to incorporate strategies for recognising good teaching, a study by Hardre and Cox (2009) indicates that research is still valued over teaching when it comes to promotion decisions. Bolliger and Wasilik (2009) suggest two strategies administration could use to recognise good teaching: providing adequate compensation, and implementing an equitable reward system for promotion for educators.

With the recent introduction of quality standards in higher education, universities, “are being held accountable for the quality of the services they provide” (University of Western Sydney, 2012) and instructors play a vital role in the success of online courses (Eskey & Schulte, 2012). Other elements that contribute to effective online learning are the systems universities employ to deliver their programs. Learning management systems (LMS) are widely used by many universities and some of their limitations and suggested alternative delivery approaches are discussed below.

Learning management systems (LMS)

Many universities use learning management systems (LMS) to deliver online learning (Coates, James & Baldwin, 2005; Lonn & Teasley, 2009). However, it appears they are primarily used as a storage facility (Sclater, 2008) for the dissemination of course materials (Lonn & Teasley, 2009; Weigel, 2005) and to help institutions manage and control student learning (Coates et al., 2005), rather than vehicles for fostering interactive learning environments that encourage student engagement (McLoughlin & Lee, 2010). Using the LMS as an information delivery vehicle tends to encourage dependency rather than promote autonomy and self-directed learning (Sclater, 2008; Weigel, 2005).

Contemporary society uses the Internet to perform all kinds of knowledge-based and social activities in their everyday life. However, higher education has failed to keep pace and systems that once facilitated online learning now constrain it (Allen & Long, 2009; Sclater, 2008). Research studies indicate LMS tools—such as discussion forums, chat rooms, wikis and blogs—provide the opportunity for practitioners to create more engaging online courses (Keppell, 2006b; Lonn & Teasley, 2009), but many practitioners lack the pedagogical and technological skills to effectively implement these tools (Weaver et al., 2008).

Carmean and Haefner (2002) argue that educators can create, “incredibly robust and effective learning environments” (p. 33) within an LMS using deeper learning principles. Wise and Quealy (2006) and Lane (2008) agree, but stress that creating meaningful student-centred learning experiences within a LMS is not easy. Lane (2009) believes few online educators are aware that their pedagogy is being influenced by the LMS design, nor that focusing on learning features and tools can lead to educators mastering only a few elements of the LMS, rather than experimenting more widely to achieve their pedagogical goals.

Other educators believe higher education institutions need to develop new systems that can act as portals to the Internet to provide learners’ with easy access to the wealth of knowledge and sophisticated tools already available to society (Allen & Long, 2009). Education administrators, faculty and students are calling for changes to the LMS environment as they seek more flexibility and personalisation for learning (Pugliese, 2012). The next generation LMS is expected to be more, “modular, interoperable and open” (Pugliese, 2012, p. 50) and will enable students to personalise their learning experience and encourage them to connect, communicate, create and share collective resources.

In a world of rapidly expanding new technologies it is no longer realistic to assume that learning will take place within one single system (Klein & Zimmermann, 2009). As the LMS continues to hinder creative teaching and learning (Mott & Wiley, 2009) educators who follow a, “pedagogy first philosophy” (Lane, 2008, p. 5) are starting to look beyond the administration and management functions of the LMS and question whether it readily fosters an authentic learning pedagogy. For example, Murphy (2012) presents a case for a community-learning model where, “content is free, open to all and always open” (p. 831).

There are many Web 2.0 technologies that may provide better learning options (Hodges & Repman, 2011) and increasingly educators are, “turning to the open architecture and customizability of the web” (Mott, 2010) to leverage tools and resources so students can create their own personal learning environments (PLEs) and select and organise their own resources.

Personal learning environments (PLEs)

A personal learning environment (PLE) is, “an emerging learning concept that allows learners to control and manage their own learning processes” (Tu, Sijo-Montes, Yes, Chan & Blocher, 2012, p. 14). PLEs provide learners with contextually-appropriate toolsets that can help foster meaningful, self-directed learning as learners are responsible for selecting the tools and managing the processes that help them to learn (McLoughlin & Lee, 2010).

However, some students lack the metacognitive and decision-making skills required to effectively build and manage a PLE (Educause, 2009). Some of the benefits of PLEs for learning include: learning with other people, learners controlling their learning resources, managing the activities they participate in, integrating their learning (e.g., through eportfolios), contributing to their learning by sharing their work with their peers (Milligan, 2006) and actively reflecting on how they learn (Educause, 2009).

Increased access to the Internet through mobile devices is providing greater personalisation for students to learn and many students are already learning outside of school (Project Tomorrow, 2012). Proponents of life-long learning and informal learning are pushing for PLEs to replace the LMS so that learning is not restricted to the confines of the educational institution. However, Sclater (2008) advises that managing a broad range of open technologies would be a complex task for universities as there are still many issues (such as copyright infringement, common interoperability standards and data backup) that need to be addressed.

Pugliese (2012) explains, “in this time of rapid change, how next-generation e-learning technologies will evolve remains to be seen” (p. 51). Nevertheless, he argues that emerging technologies will support deeper engagement in the open world and that open environments will play a critical role in successful online learning. He defines *open* in this context as, “open interaction, sharing and connection” (p. 51).

Open network learning environments (ONLEs)

Many educators believe learning should be open and social (Brown & Adler, 2008; Caswell, Henson, Jensen & Wiley, 2008; Cormier & Siemens, 2010; Downes, 2009; Murphy, 2012) and increasingly teachers and learners are showing a greater interest in open web technologies as they, “can support self-governed, problem-based and collaborative activities in a better way” (Baltzersen, 2010). Open network learning environments are digital environments that, “empower learners to participate in creative endeavours, conduct social networking, organize/reorganize social contents and manage social acts by connecting people, resources and tools by integrating Web 2.0 tools to design environments that are totally transparent, or open to public view (Tu et al., 2012, p. 14).

Mott and Wiley (2009) propose a conceptual framework for an *open learning network* (OLN) that combines the best of what the LMS and PLEs have to offer to create a new model for learning. The OLN has three key features: (1) it is malleable, (2) it leverages up-to-date technologies, and (3) it strikes a manageable balance between privacy and the promise of the

cloud (Mott, 2010). Mott explains, “the OLN seeks to keep data that must be private and secure as private and secure as possible. All other data — at the option and discretion of teachers and students — can exist in the cloud” (2010).

An example of what a typical OLN framework might look like is shown below in Figure 3. The left side of the picture depicts where private information and proprietary content is stored and the right represents the open web where all other resources and content is housed.

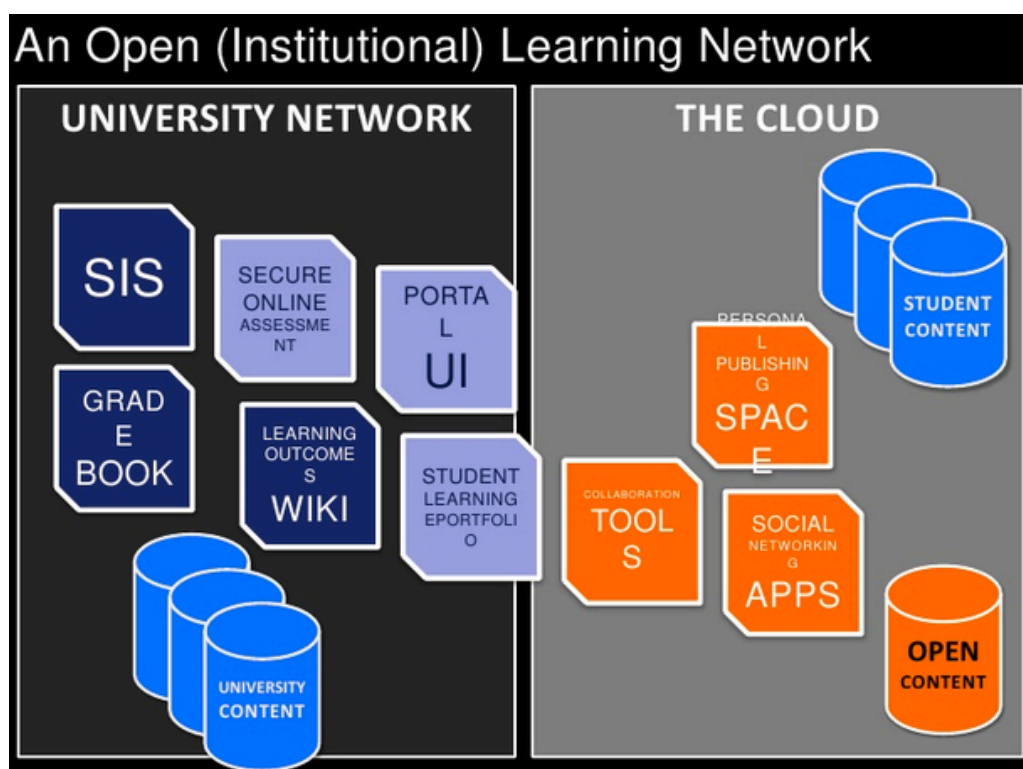


Figure 3: Open learning network (OLN) conceptual model (Mott, 2010)

In 2011, Bates reported, an increasingly large number of institutions and individuals are making their online content freely accessible (2011a) and there are now many openly licensed resources created by educators and students available on the Internet that educators are free to use for educational purposes.

Open educational resources (OER)

Open educational resources (OERs) are materials designed to support educational and informal learning programs that are licensed to allow free access and use by anyone in the world (Anderson, 2008a; Baltzersen, 2010; Curtin University of Technology, 2011). In this context “open” means that the end-user should be able to read, adapt, build upon and reuse

the resource as long as they *at least* attribute the original creator (Hysten, 2006). Example licenses that give permission for reuse and adaption include: GNU (see: <https://www.gnu.org/licenses/licenses.html>) and Creative Commons (see: <http://creativecommons.org/licenses>). OERs may include learning content, software to support the development, use and delivery of learning content, or implementation resources such as: intellectual property licenses and design principles (Hysten, 2006).

The concept of open education resources (OER) is based on the educational value of sharing knowledge. The emergence of Web 2.0 has shifted the focus of the web from information transmission and consumption to being a social platform, where people can engage in conversation by creating, sharing, remixing and repurposing open content using a wide range of social media (Downes, 2005). Although, Bates (2011b) argues, “that open content on its own will not do much for open learning, because education is more than about delivering content” (para. 10) it is a dynamic process involving questioning, discussion, interaction and feedback from peers, teachers and others.

The rapidly growing pool of high quality OERs (Okada et al., 2014; Olcott, 2012) and the ease with which digital OER materials can be shared via the Internet (Butcher, 2011) offers educators and students access to a broader range of information, rather than a single textbook, to encourage learners to think critically and make decisions about the content they select. Other reasons for using OER resources include their potential to foster a culture of sharing and open use of educational materials, they offer educators new ways of thinking about sustainable online content, and they may help to reduce textbook costs for students (Semington, 2014).

Anderson (2008a) identified a number of institutional and personal challenges educators face when using OERs, such as copyright and ownership issues, quality control, contextualisation, technical and legal issues and sustainable development and delivery business models. However, he noted that “despite these obstacles and concerns the increase in content and quality of OER resources continues to grow” (Anderson, 2008a, p. 2).

The affordances of the social web also provide the opportunity for students to contribute to the growing pool of OERs by publishing their own work on the web under open licenses (e.g., Creative Commons) and Harris (2012) predicts, “social networking will play a significant role in interacting with OA [open access] content for students” (p.8). Some of the affordances that social web technologies have for assisting educators to create authentic learning environments are discussed in the following section.

Social web technologies

It has long been argued that social interaction among students, teacher, content and the environment contributes to the development of knowledge and are essential components of learning (Brown et al., 1989; Garrison et al., 2000; Kop, 2010; Kuh, Laird, & Umbach, 2004; Wenger, 1998). Particularly, in an online learning environment, communication, collaboration and active participation are viewed as vital elements for successful authentic learning (Herrington & Oliver, 2000; Lombardi, 2007b).

Research indicates discussions do not occur naturally between online learners but rather needs to be promoted, and strategies must be employed to create, monitor and nurture online interaction and communication (Maor, 2007; Sieber, 2010). Until recently it has been difficult for educators to incorporate these elements in an online environment. However, rapidly emerging new technologies and applications such as social networking websites, wikis, blogs, chats and other online tools offer educators the opportunity to incorporate activities to encourage online students to interact, communicate and collaborate in a variety of ways (Hodges & Repman, 2011; Kim & Bonk, 2006; Kop, 2008; Lane, 2008; McLoughlin, 2014).

Although many educators have embraced the use of social web technologies, Gomes and Gomes (2013) suggest they often do so in isolation, and that in order to take advantage of the teaching and learning opportunities offered by Web 2.0 tools and services, higher education institutions need to consider incorporating these technologies within their online learning programs as, “the use of web 2.0 tools to train future teachers leads to better practices in using them” (p. 91).

Proponents of constructivist learning environments believe interaction, communication and collaboration are core elements for creating and sustaining purposeful learning communities (Garrison, Cleveland-Innes & Fung, 2010; Kop, 2010) and the affordances of social media technologies can assist educators in developing and supporting meaningful online learning (McLoughlin, 2011).

Community of Inquiry

Garrison et al. (2000) developed an educational *Community of Inquiry* (CoI) framework for studying the potential and effectiveness of computer conferencing in online environments. They describe a Community of Inquiry as a learning space, “where critical reflection and discourse are encouraged and practiced to construct personal meaning and confirm mutual understanding” (Garrison et al., 2000, p. 9).

Philosophically, the CoI framework is consistent with Dewey's view of community and inquiry as a social activity (Garrison, Anderson & Archer, 2010). The CoI model (see Figure 4) encompasses three interdependent elements of *presences*—cognitive, social and teaching—that Garrison et al. (2000; 2010) believe are essential for creating meaningful educational experiences.

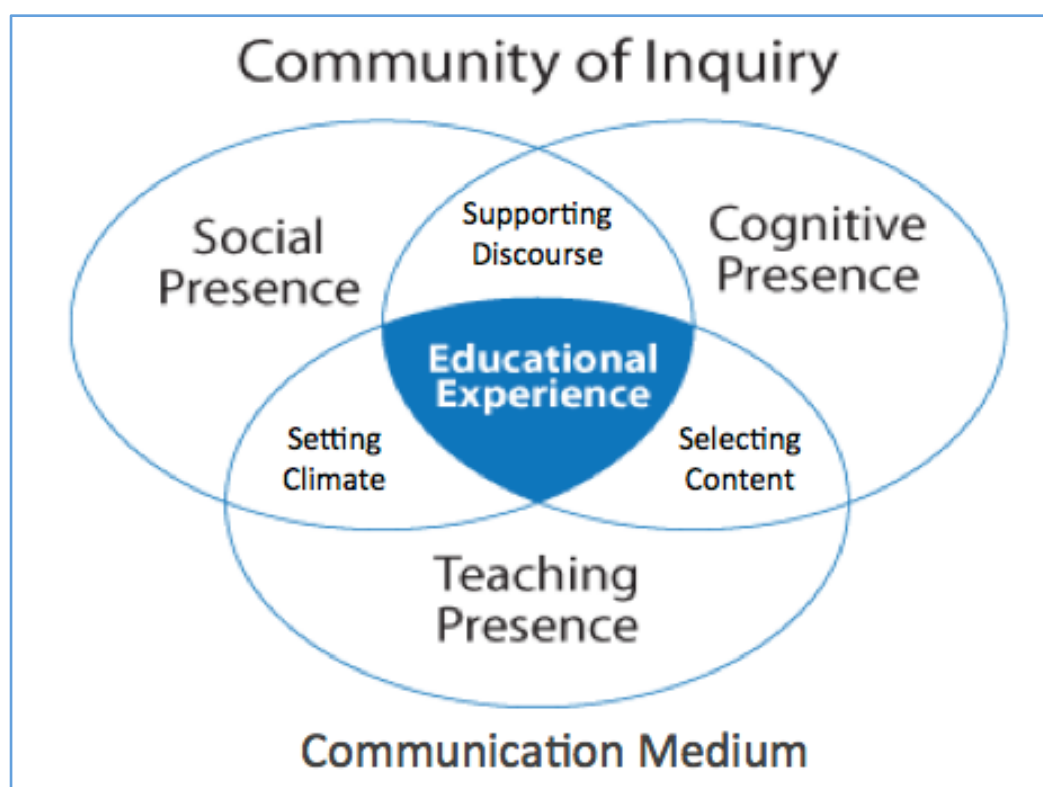


Figure 4: Garrison, Anderson and Archer's (2000) Community of Inquiry model

Social presence

Gunawardena and Zittle (1997) defined social presence as, “the degree to which a person is perceived as a ‘real person’ in mediated communication” (p. 9). Garrison and Akyol (2009) described it as, “the ability of participants to identify with the community, communicate purposefully in a trusting environment and develop inter-personal relationships” (p. 24). Social presence research indicates that online learners are able to project their identities, feel the presence of others and create communities to explore issues of common interest (Gunawardena & Zittle, 1997). This indicates social presence plays a key role in supporting collaboration and building an effective Community of Inquiry (Garrison & Akyol, 2009).

Rourke and his colleagues (1999) identified 12 indicators of social presence (Appendix 7) that they categorised into three types of communication responses: affective, interactive and

cohesive. Garrison et al. (2000) used three similar categories that they described as: affective expression, open communication and group cohesion. According to Sheridan and Kelly (2010), *affective expression* includes expression of emotions, use of humour and self-disclosure; *open communication* refers to students' willingness to converse and respond with each other in an honest and respectful manner; and *group cohesion* represents students agreeing with one another and use of inclusive terms when referring to classmates.

High levels of interpersonal contact contribute to creating a learning environment that is warm, collegial and approachable for all involved. When students perceive the learning experience as enjoyable and fulfilling, they tend to interact more and remain in the course for the entire program (De Gagne & Walters, 2009). Social expression can facilitate trust-building that, in turn, contribute to making group interactions more appealing, engaging and intrinsically rewarding (Aragon, 2003).

Using technologies to help learners connect, communicate and collaborate can support the development of social presence and contribute to building an online community of learners. However, in an online environment, technologies dedicated to social affordances are still very rudimentary (Järvelä, Kirschner, Panadero & Malmberg, 2015). A social affordance is, "the relationship between the properties of an object and the social characteristics of a group that enable particular kinds of interaction among members of that group" (Bradner, Kellogg & Erickson, 1999, p. 154).

Aragon (2003) suggests social presence is not the only variable for building a sense of community among distance learners. However, he believes, "it is one of the first components that must be established in order to initiate learning in an online environment" (p. 58) and help maintain student motivation and engagement. Social presence can also support *cognitive presence* by indirectly contributing to the process of critical thinking.

Cognitive presence

Garrison et al. (2000) describe cognitive presence as, "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication" (p. 89). They suggest it is mostly, "associated with the literature and research related to critical thinking" (Garrison, Anderson & Archer, 2001, p. 1) and claim that it is a major indicator of successful online learning in higher education.

According to Garrison et al. (2001) cognitive presence reflects a four-phase learning and inquiry process (Appendix 8) that occurs within, "an environment of reflection and discourse; analysis and synthesis" (Garrison, Cleveland-Innes et al., 2010, p. 32). The

selection of pedagogical strategies for developing cognitive presence will depend on which type of cognitive processes students may be required to use to achieve the expected learning outcomes. Nonetheless, promoting cognitive engagement with both the content and fellow learners can help develop higher-order thinking and knowledge acquisition (Garrison et al., 2001; McLoughlin & Maynard, 2009).

Teaching presence

Teaching presence encompasses the, “design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (Anderson, Liam, Garrison & Archer, 2001, p. 5). Arbaugh and Hwang (2005) believe teaching presence is, “a mechanism for bridging the transactional distance between learner and instructor commonly associated with distance education” (p. 10). Teaching presence includes: curriculum content, learning activities and timelines, managing purposeful collaboration and reflection and assisting the community to achieve the intended outcomes (Garrison et al., 2000; Garrison, Cleveland-Innes et al., 2010).

Teaching strategies, “play a significant role in establishing social presence for online environments” (Aragon, 2003, p. 63). Similarly, they also play an important role in supporting the development of cognitive presence. Some example strategies for supporting social, cognitive and teaching presence have been identified in Appendix 9.

Community of Inquiry model

Over the last decade the CoI framework has been widely adopted by educators, and Garrison et al.’s seminal work has been cited by thousands of scholars. According to Google Scholar, *Critical inquiry in a text based environment: Computer referencing in higher education* (Garrison et al., 2000) has over 2,770 citations and *Critical thinking, cognitive presence, and computer conferencing in distance education* (Garrison et al., 2001) over 1,420 citations as at May, 2015. The CoI framework has been extensively studied and tested over the years and although the focus and terminology have shifted from a specific view of computer-mediated communication to encompass a broader perspective of the dynamics of an online learning experience, the, “three constructs have been proven to be relatively stable” (Garrison, Anderson et al., 2010, p. 6).

The original model indicated that the overlapping areas of social (SP) and cognitive (CP) presence assist with *supporting discourse*, social (SP) and teaching (TP) presence assist with *setting climate*, and cognitive (CP) and teaching (TP) presence assist with *selecting content*. However, these three areas of overlap have not been explored explicitly in the context of this model (Garrison, 2013, email correspondence). Garrison advised the three intersections have

only, “been explored indirectly through various practical implications and suggestions”. He also advised that he has begun to explore the intersection of TP and CP [*selecting content*], “through the construct of metacognition and regulation” and has relabelled this intersection as *regulation of learning*. “We are in the final stages of validating this construct...and I would encourage you to explore these if that is within the scope of your research” (Garrison, 2013, email correspondence).

The CoI model appeared to be a useful framework for developing more engaging online learning environments, therefore a review of the literature specifically related to Garrison et al.,’s CoI model was conducted. Data was collected from a range of sources such as: the CoI website, Google Scholar, online library catalogues and key educational databases (e.g., Eric, ProQuest, SAGE Journals etc.). Search criteria included: CoI, CoI framework, Community of Inquiry model, social presence, cognitive presence, teaching presence, setting climate, building rapport, supporting discourse, effective teachers and effective teaching strategies. Only papers that specifically referred to Garrison et al.,’s CoI model were included in the analysis.

Papers were analysed to identify the key focus of the work and then grouped into categories based on components of the model: CoI model, social presence, cognitive presence, teaching presence, setting climate, supporting discourse and content selection. The review identified numerous papers relating to the social, cognitive and teaching presence elements of the model. There were also a few articles specifically focused on the intersection *supporting discourse*. However, very few articles were found about the intersections concerning *setting climate* and *selecting content* in the context of this model. A summary of the number of articles written about the various elements of the Community of Inquiry model is shown below in Figure 5 and a detailed list of articles is provided in Appendix 10.

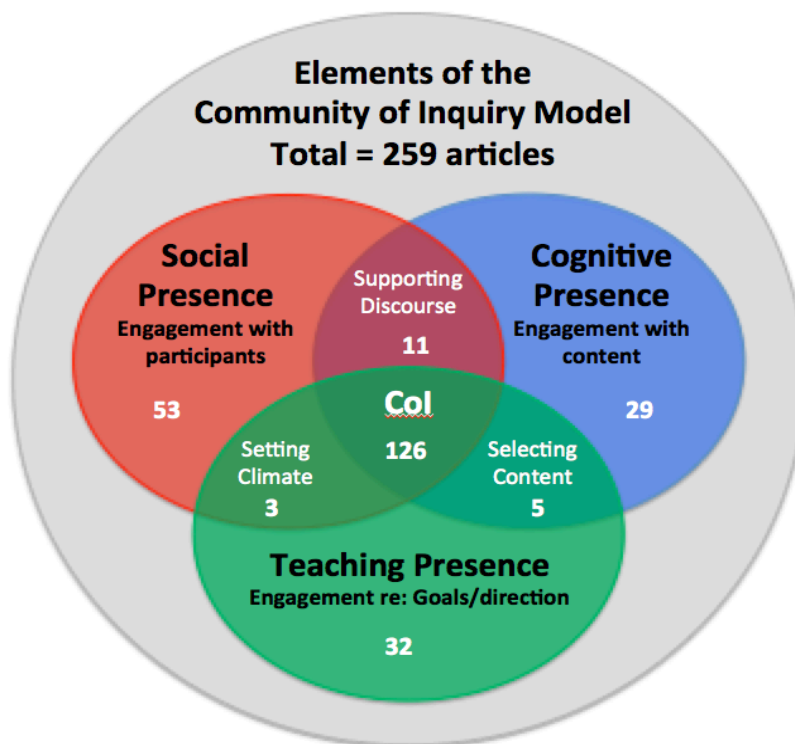


Figure 5: Summary of articles written about the elements of the Community of Inquiry model

Much of the research on CoI supports the usefulness of the model, or specific components of the model, for supporting effective online learning (Jackson, Jackson & Chambers, 2013; Pecka, Kotcherlakota & Berger, 2014) and suggest the framework can be used to develop environments that encourage students to integrate, synthesise and evaluate ideas and knowledge (Darabi, Arrastia, Nelson, Cornille & Liang, 2010). Although, there are a few studies that challenge the usefulness of social presence and question the claim that the CoI model promotes meaningful learning (Annand, 2011; Rourke & Kanuka, 2009).

Rourke and Kanuka (2009) are concerned at the lack of empirical evidence about the framework's central claim that it promotes deep learning. They conducted an investigation of the literature from 2000-2008 and identified 48 studies that collected and analysed data about the CoI model and claimed only five were concerned with measuring student learning. They suggest the focus of most studies has been on learning and teaching processes rather than outcomes and until the model can be verified to support the achievement of student learning outcomes, the studies about processes are irrelevant.

Annand (2011) suggests the CoI model overstates the effects of social presence and its contribution to meaningful learning. He indicates that mandated participation creates an

artificial experience that, “impedes the formation of true communities of inquiry in most higher education settings and therefore significantly undermines in practice the perceived effects of collaboration and the assumption that co-construction of knowledge is occurring” (2011, p. 50). Annand recommends that social presence should be split into two categories: group based activities and individual learning activities.

Whilst some researchers voice their misgivings about the value of social presence and its contribution to meaningful learning, other educators have adapted the CoI model to meet their specific needs. For example, Pecka, Kotcherlakota and Berger (2014) thought the CoI model lacked applicability to the development of higher order thinking skills. In an effort to address this shortcoming, they created a *derived CoI model* that incorporated the phases of inquiry and Bloom’s revised taxonomy (cf. Pecka et al., 2014). They suggest their revised model, “provides a means to design, evaluate and research higher order thinking in nurse anaesthesia distance education courses” (Pecka et al., 2014, p. 212).

A recent review of the literature conducted by Kozan and Richardson (2014) cited five research studies undertaken in 2009 and 2010, and surmised that all of the studies, “strongly suggest that there may be close interrelationships between and among the presences” (p. 70). They noted that two of the studies suggested social presence played a *mediating role* between teaching and cognitive presence. However, the results of their study did not align with these finding. They concluded, “the interrelationship between and among the presences may significantly depend on the particular learner group and learning context. Such an assumption is in line with the dynamic nature of the CoI Framework and its main focus on the learning process” (pp. 71-72).

As a result of their ongoing research, Garrison et al. have implemented minor refinements to the original CoI model and the most recent version of the model that is published on the CoI website is shown below in Figure 6 (Garrison, Cleveland-Innes & Vaughan, n.d.).

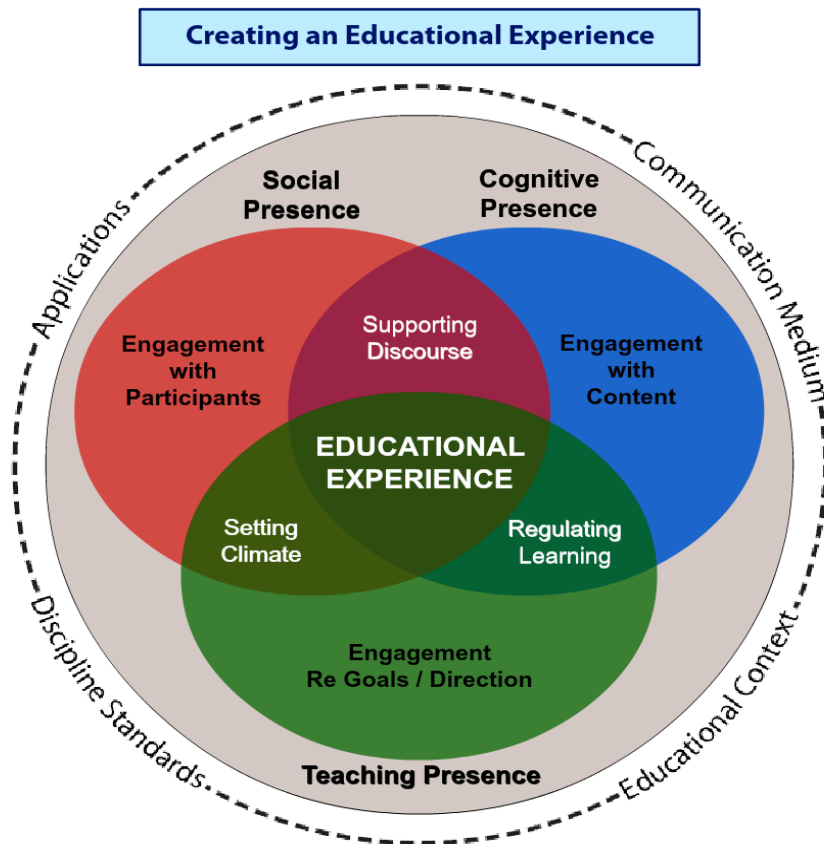


Figure 6: Community of Inquiry model 2014 version

In the latest version of the model the intersection between cognitive and teaching presence, previously referred to as *selecting content*, has been renamed *regulating learning*. However, no mention about why this component had been renamed was found in the literature. According to Garrison (2014, November, personal communication) this updated version of the CoI model and the renaming of this component to *regulating learning* was derived from recent research about shared metacognition, that is, self and co-regulation (cf. Garrison & Akyol, 2013, 2015).

Despite some concerns about the CoI model promoting higher-order thinking skills, numerous studies suggest interaction and communication among students and teachers are important elements for effective online learning (Romero & Guardia, 2014; Wong & Abbruzzese, 2011; Zydney, deNoyelles & Seo, 2012). The CoI model is also a useful framework for selecting appropriate instructional technologies and resources to support computer-mediated communication, reflection, and collaboration in online and blended learning environments (Garrison & Akyol, 2009).

Computer mediated communication (CMC)

Computer-mediated communication (CMC) technologies can support different modes of discourse: synchronous (real-time) or asynchronous (non-time dependent) (Sharp, Rogers & Preece, 2007). According to Hrastinski (2008), synchronous and asynchronous modes complement each other as they each facilitate different types of communication.

Asynchronous communications (e.g., discussion forums, newsgroups, blogs) encourage *cognitive* participation and are best suited to discussing complex content-related issues as learners have more time to process information, reflect on and refine their responses.

Synchronous communications (e.g., chat, voice over IP, videoconferencing) are more *social*, they encourage personal participation and are more suitable for developing rapport amongst students and encouraging the formation of a community of learners. Both forms of communication are useful for providing *teacher* support.

However, inappropriate integration of multiple Web 2.0 technologies and lack of understanding about how these tools work, has created frustration for both students and educators (Mott, 2010). Despite the frustrations, social web technologies are still perceived as valuable tools for fostering online interaction, communication and collaboration (Murphy, 2012; Sieber, 2010; Wong & Abbruzzese, 2011). They also align with authentic learning as they offer greater opportunities for students to interact with experts in the field, access multiple perspectives about the content, articulate understanding to a broader audience and have more control over the technologies they use to learn content and publish products.

Conclusion

Online higher education courses are pre-dominantly teacher-centred information repositories that have led to student isolation and boredom. The demand for more student-centred online courses is increasing and the affordances of new technologies have opened the door for educators to create more interactive and engaging learning experiences.

If universities wish to remain competitive it is imperative they provide quality online programs (Gomes & Gomes, 2013). The growing use of social networking sites, blogs and wikis in Web 2.0 environments has prompted institutions to investigate ways to harness the power of the tools, resources, services and content for student learning (Kim & Bonk, 2006). However, they need to look at ways of supporting and encouraging educators to improve their existing teaching practises.

The literature suggests immersing educators in the desired learning environment has the potential to change existing teaching practises (Keppell, 2006a; McLoughlin & Maor, 2005).

Providing educators with a range of flexible learning options that focus on pedagogy as well as technology use (Sclater, 2008) could help them understand how real-life learning approaches can be implemented effectively within rigid learning management systems (Oliver, 2005). Other factors that impact on the quality of online learning include: recognition for good teaching, opportunities for faculty to share their stories, open access to the vast array of web resources and social interaction and communication.

Reflecting on the existing literature has helped to clarify some of the major issues associated with online learning and assisted with the development of the primary and secondary research questions used to guide this study. The draft design principles derived from the literature, were used to design a professional development intervention to help educators design more engaging online learning experiences for higher education students.

The following chapter describes the methodology employed for the design-based research study that endeavoured to answer the research questions to inform theory and offer a new perspective to the field of education for developing sustainable online learning environments across the university sector.

Methodology

The research conducted in this thesis sought to understand the effectiveness of a purposely-designed online learning environment based on authentic learning principles. A design-based research (DBR) approach was selected to guide the study because of the alignment of this approach with the overall aim of the study to improve existing online learning practices. The key aims of design-based research comprise increasing the relevance of research for educational policy and practice, developing empirically grounded theories using naturally occurring test beds and increasing the robustness of design practice by contributing to theory building (McKenney, Nieveen & van den Akker, 2006). Design-based research is a fairly new research methodology that has the potential to, “bridge the chasm between research and practice in formal education” (Anderson & Shattuck, 2012, p. 16).

Over the past decade there has been an increasing interest in DBR and it is becoming a more prevalent research methodology, in particular for the purpose of researching the effectiveness of online and mobile technology interventions, and its focus on theory building and developing practical, effective applications (Anderson & Shattuck, 2012). Like action research, design-based research is accomplished at the *coal face*; however, it involves an ongoing iterative process to monitor the effectiveness of a specifically designed artefact (Kelly, 2004).

Design-based research is also commonly referred to as *design research*, *development research* and *design experiments* (van den Akker, Gravemeijer, McKenney & Nieveen, 2006). Despite the varied terminology most authors agree this type of research includes the following characteristics:

- *Interventionist*: the research aims at designing an intervention in a real world setting
- *Iterative*: the research incorporates a cyclic approach of design, evaluation and revision
- *Process oriented*: a black box model of input-output measurement is avoided, the focus is on understanding and improving interventions;
- *Utility oriented*: the merit of a design is measured, in part, by its practicality for users in real contexts

- *Theory oriented*: the design is (at least partly) based upon theoretical propositions, and field testing of the design contributes to theory building (van den Akker et al., 2006, p. 5).

Several models of design-based research exist, however, Reeves (2006a) DBR model was selected to guide the conduct of the study as it is the only model specifically designed to accommodate technological affordances. A revised model developed by McKenney and Reeves (2012) was considered, however, the researcher felt this later model did not clearly articulate the importance of creating and refining design principles for implementing the proposed solution.

Reeves' (2006a) model consists of four iterative phases as illustrated in Figure 7 and described below.

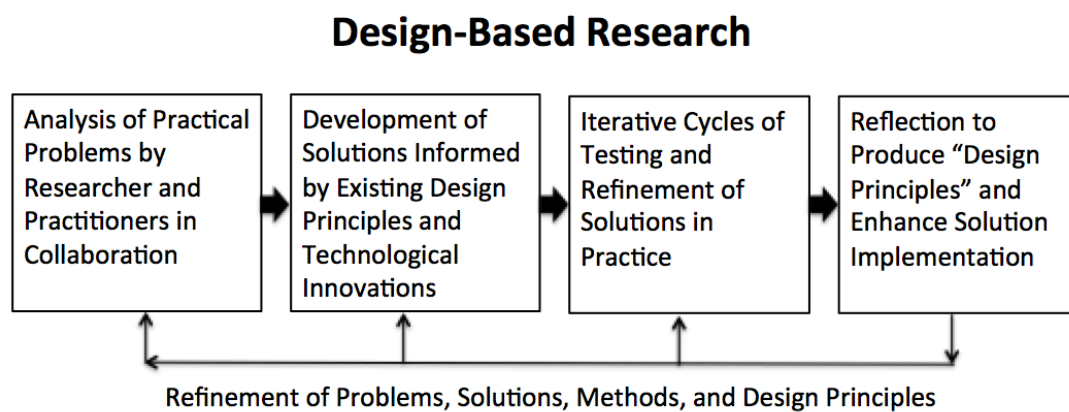


Figure 7: Four phase of design-based research (Reeves, 2006a, p. 59)

Phase 1 addresses three areas: the problem, the literature review and consultation with practitioners. During this phase the researcher clearly articulates the problem and investigates what research has already been conducted in the same or related fields. By the end of Phase 1, the researcher should be able to create preliminary research questions to guide the research (Herrington et al., 2010).

Phase 2 focuses on developing solutions to the problem and designing the learning environment. During this phase draft design guidelines are formulated and technology affordances identified. By the end of Phase 2, the researcher should be ready to implement and evaluate the planned e-learning intervention (Herrington et al., 2010).

Phase 3 involves implementing and evaluating the solutions identified in Phase 2 in iterative cycles of practice. The purpose of design-based research is twofold: (1) to determine whether

the original solution was effective; and (2) to investigate how the original solution can be modified to further improve the solution. A typical study will consist of two or more iterative cycles. By the end of Phase 3 the researcher should be ready to reflect on the entire process and report the research findings to the wider education community (Herrington et al., 2010).

Phase 4 is the final stage of the design research project where researchers reflect on the entire process to produce design principles for enhancing future implementations. Resulting guidelines and design principles are significant for teachers and instructional designers as they can be used to inform the design of educational learning environments that, in turn, can facilitate student learning.

How each of the phases guided the methodology adopted in this study is described in the following sections.

Phase 1: Analysis of the problem

The problem analysis and literature review are described in Chapters 1 and 2, together with the research questions that guided the study. Consultations with three higher education practitioners were conducted to help to clarify the problem area and to inform draft design principles for the design of the intervention. The salient findings of the consultations are discussed in Chapter 1 and draft design guidelines derived from the consultations and literature review are presented in Chapter 4.

Phase 2: Development of solutions

During *Phase 2*, draft design guidelines were formulated from the research activities conducted in *Phase 1* and technology affordances identified. An intervention was designed in the form of a 5-week professional development course (entitled *Authentic eDesign*) where higher education practitioners could learn how to implement an authentic community of learning framework within a learning management system environment. This intervention was ready for implementation and evaluation in *Phase 3* and is described in detail in Chapter 4.

Phase 3: Iterative cycles of testing and refinement

Phase 3 comprised the main implementation and data collection activities of the study. It involved implementing and evaluating the solutions designed and created in *Phase 2*, in iterative cycles of practice with the target group. The purpose of this phase was twofold: to

determine whether the original solution helped to improve learner achievement of objectives and to investigate how the original solution could be modified to further improve the outcomes.

Three iterations of the designed solution were implemented with the target group (higher education practitioners) over a period of two years. Participant feedback and facilitator reflections from each iteration of the course were analysed to identify areas for improving the subsequent iterations. Recommendations for improving the course were implemented prior to conducting each iteration. The implementation and evaluation of the designed solution is discussed in detail in Chapter 5.

Participants

An invitation email was sent to all five Western Australian Universities inviting educational professionals involved in designing and delivering online courses for higher education to take part in the research study. A snowballing method (Miles & Huberman, 1994) was also used initially where recipients were encouraged to forward the email invitation to anyone they thought might be interested in participating in the study.

A minimum of 10 participants was deemed necessary to run each course, as based on the literature (Maor & Volet, 2007a), as it was anticipated the attrition rate might be around 50% due to workload and/or other issues experienced by busy professionals. Three to five completions in each iteration was deemed to be an appropriate number for the study as the intent was to obtain in-depth and complex qualitative information about the effectiveness of the e-learning approach.

An email was sent to all prospective participants that included an information letter explaining full details about the research study and a copy of the research consent form. To enrol in the course participants were required to return the completed consent form acknowledging that they had read and understood the purpose and procedures of the study and to give permission for data obtained before, during and after the course to be used for the research study.

Evaluation methods

The data analysis was required to inform a decision on whether the authentic learning elements, pedagogical strategies and technologies employed were effective in facilitating participant learning and whether any improvements could be made for future implementations. Four questions identified by Reeves and Hedberg (2003) were used to guide the design of the evaluation process:

-
- What kinds of decisions can be anticipated from the evaluation?
 - What questions need answering in order to make the decisions?
 - What information is needed to answer the questions?
 - What data collection instruments are required to obtain the information?

Reeves and Hedberg's (2003) integrated framework for evaluating interactive learning systems provided overall guidance to identify the information that was required to answer the above questions, together with appropriate data collection methods for each phase (Appendix 11). The primary evaluation functions undertaken for this study were *formative* and *effectiveness* evaluations.

Ideally, impact evaluations should be conducted approximately two years after the invention to allow time for the changes to be implemented and have an effect in the workplace (Reeves & Hedberg, 2003). However, a limited impact evaluation (Chapter 9) was also conducted seven months after the 1st iteration of the course to determine what influence the intervention had on changing educators' existing teaching perspectives and practices.

Data collection methods

Qualitative methods were used to allow detailed information to be collected from participants about their experience with the authentic learning environment and tasks. The following data collection methods were employed for all iterations of the course:

- *Participant background questionnaire* (Appendix 12): an online questionnaire completed before each course to obtain participants' background information and to identify their existing teaching practices, knowledge and skills.
- *Prospective teaching questionnaire* (Appendix 13): an online questionnaire completed after each course to identify participants' potential future teaching strategies to determine what influence the course had on their existing teaching practices.
- *Course evaluation questionnaire* (Appendix 14): an anonymous online questionnaire that participants were asked to complete at the end of the course to identify areas for improving subsequent iterations of the course.
- *Facilitator reflections*: these were documented in an e-journal during each implementation of the course to identify both what worked well and areas for improving subsequent iterations of the course.
- *Participant artefacts and comments*: that were made during the normal progression of each course, such as: LMS Forum posts, Blog posts, Skype chat

messages, Diigo comments and Email correspondence to determine the effectiveness of the intervention in achieving the learning outcomes.

- *Participant interviews* (Appendix 15): were conducted and recorded with selected participants approximately six months after the completion of the course. The purpose of the interviews was to determine what influence the framework had on the integration of elements and technologies had on participants' teaching. Participant selection was based on responses to the prospective future teaching questionnaire where participants indicated if the course had exposed them to new ideas and/or tools they would like to include in their future courses.

For the 1st iteration of the course, data for the *background questionnaire* was collected using a Google Forms questionnaire. However, this method did not allow participants to retain a copy of their completed questionnaire, which made it difficult for them to respond appropriately to the *prospective teaching questionnaire* at the end of the course. Thus, data for the *participant background questionnaires* for the 2nd and 3rd iterations was collected using a word-processed document submitted using the assignment submission activity on the Moodle learning management system. Data from the anonymous online *course evaluation questionnaire* was gathered via Google Forms for all iterations and participant interviews were recorded and transcribed.

Data analysis methods

Data— transcripts of interviews, researcher notes and other documentary evidence—was coded and analysed using Glaser and Strauss's (1967) constant comparative method of qualitative analysis. This joint coding and analysis method enabled data to be systematically categorised and analysed so that participant responses could be grouped into relevant themes to facilitate comparison and analysis. This method involves four stages: (1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) delimiting the theory, and (4) writing the theory. Each stage provides continuous development to its successive stage until the analysis is finished (Glaser & Strauss, 1967, p. 105).

Figure 8 below illustrates the constant comparative analysis process used for this study.

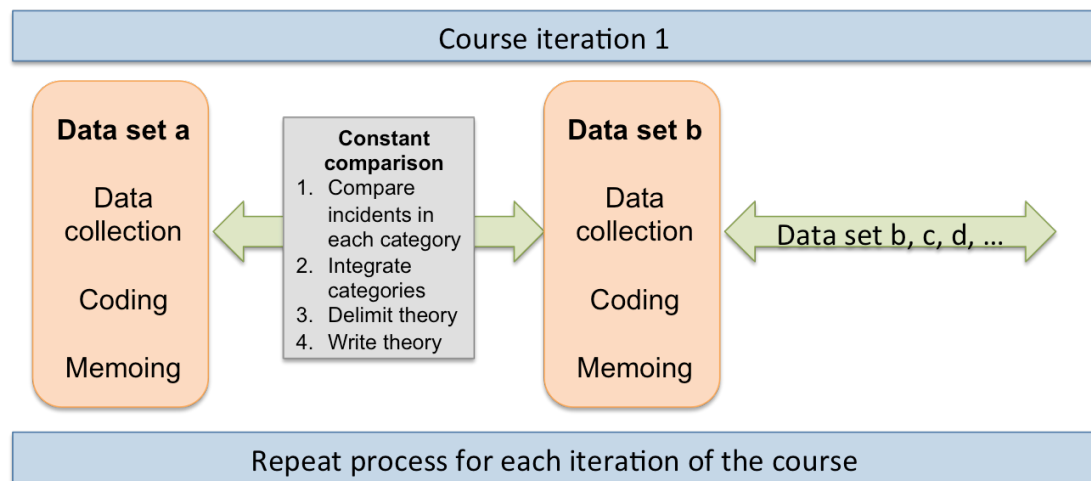


Figure 8: Data analysis using constant comparative analysis
(based on Glaser & Strauss, 1967, p. 105)

Data analysis of the participant course survey and facilitator reflections were analysed at the end of each implementation of the course to identify areas for improving future iterations. Data collected from all implementations were used to answer the following secondary research questions:

1. In what ways do the components of social, cognitive and teaching presence facilitate the design and delivery of authentic online courses within higher education?
2. How effective is an authentic online learning framework in encouraging practitioners to implement new pedagogies and technologies within their own online courses?

Answers to the secondary questions from all courses contributed to the research findings and informed the researcher's response to the overall research question:

Can immersing higher education practitioners in an authentic learning environment assist them to create more interactive and engaging online learning experiences within a learning management system?

The data analysis and findings are discussed in detail in Chapter 5 -8.

Trustworthiness and ethics

The following strategies were used to ensure trustworthiness of the data and findings (Koch, 1994; Liamputtong, 2009). Data was collected using multiple methods (i.e., anonymous

evaluation surveys, demographic and teaching surveys, Skype, Diigo, & blog post transcripts, email correspondence & interviews). Where possible, verbatim quotes have been used to ensure participants' voices were accurately represented and transcripts were sent to participants for verification.

Ethical guidelines stipulated by Murdoch University were followed to ensure the research was conducted in a fair and equitable manner. The researcher was also the course facilitator; however, as the intervention was a professional development opportunity and no examinations or results were required for the course, it was deemed appropriate for the researcher to recruit and correspond directly with participants. All participants were informed of the nature and extent of the research and asked to sign a consent form prior to commencing the course. To ensure confidentiality, access to the original data was confined to the researcher and no information that could identify the participants was included in the transcriptions or research reports. Pseudonyms were used in place of participant names and respondent numbers were used to refer to data received from the anonymous online surveys. No apparent risks to participants or other ethical issues were identified.

Phase 4: Design principles

Design principles guided the design of the intervention and the data collected from all iterations of the study provided feedback on not only the design of the environment itself, but also the principles that informed the design. Principles were reviewed between iterations and at the conclusion of the study to provide a refined framework of design principles. The refined design principles and recommendations to inform theory and offer a new perspective to the field of education for developing an authentic online community of learning experiences across the university sector are reported in Chapter 10. Resulting guidelines and design principles are significant for teachers and instructional designers as they can be used to inform the design of learning environments that, in turn, can facilitate student learning.

Summary

This chapter has described the overall research approach adopted in the study, together with the methodology employed to conduct the study. It explained the four-phase design-based research methodology, the target audience, the types of evaluation, data collection and data analysis methods. The design of the intervention is discussed in the next chapter.

Design of the learning environment

Phase 2 of the design-based research focused on developing solutions to the problem and designing the learning intervention. During this phase of the research, draft design guidelines were formulated and pedagogical strategies and technology affordances identified, based on the findings of consultations with practitioners (Chapter 1) and an extensive literature review (Chapter 2).

This chapter describes the design of the professional development program that was implemented to evaluate the effectiveness of using an authentic learning framework supported by new technologies within a learning management system.

Online learning issues

The following issues and suggestions, extracted from both the practitioner interviews (Chapter 1) and literature review (Chapter 2), were salient in guiding the design of the professional development intervention that was developed and implemented in the study. Factors include:

- selecting methods to encourage interaction and participation
- providing students with access to the entire course content from the start of the course
- including opportunities/incentives for quality online discussions
- educating students to take more responsibility for their learning
- allowing time for students to explore and learn about new technologies
- providing examples of instructional design strategies and how online pedagogies and web technologies could be used to achieve the desired learning outcomes
- including opportunities to network with peers and fostering community of learning.

One possible solution for improving the quality of online learning in higher education—that was tested in this research project—was to create an online professional development course based primarily on the components of the Community of Inquiry (CoI) model and the principles of authentic learning. This course would enable practitioners to design their own

authentic learning courses while experiencing online learning as learners themselves and networking with their peers.

Potential design principles

The literature review conducted in *Phase 1* identified a range of potential design principles that could be used to guide the design and development of the intervention. In particular, these included: principles of authentic learning and elements of authentic tasks (Herrington et al., 2010) and components of the Community of Inquiry model (Garrison et al., 2000) as *a priori* principles for implementing an effective student-centred authentic learning environment. Two other key concepts underpinning the framework are: learning with technology (Jonassen, 1994) and the use of a variety of open educational resources (Hysten, 2006). How these principles and concepts relate to one another is shown in Appendix 16.

Herrington's principles of authentic learning were derived from an extensive analysis of the literature produced by leading researchers principally between 1985 and 1995 to identify key features for effective situated learning. Over the ensuing years, educators and researchers have developed principles, guidelines and frameworks based on social constructivist theories of learning in their quest to design and implement effective e-learning in different contexts.

A more focussed analysis of the literature was conducted in *Phase 2* of the research study to determine other principles that might guide the design and development of the proposed professional development solution. In particular, the analysis focused on publications released after 2000 that discussed authentic learning (Grift, 2009; Lombardi, 2007a; Wiggins, 2009) or student-centred approaches similar to authentic learning such as: project-based learning (Grant, 2002, 2011; Helle, Tynjala & Olkinuora, 2006), problem-based learning (Hmelo-Silver, 2004; Savery, 2006) and work-based learning (Billett, 2002; Thalheimer, 2010; Warner et al., 2012). Other models, principles and strategies associated with online learning were also considered such as: adult learning (Johnson & Aragon, 2003; Kop, 2008), active learning (Berge, 2002; Pan & Hawryszkiewicz, 2004), communities of inquiry (Anderson, 2008c; Anderson et al., 2001), deeper learning (Carmean & Haefner, 2002) and other effective educational practices (Crawford-Ferre & Wiest, 2012; Green et al., 2010; Kim & Bonk, 2006; Koohang et al., 2008; Kuh et al., 2004; Levin-Goldberg, 2012; Maor & Volet, 2007a; National Survey of Student Engagement, 2010; Pelz, 2004; Stewart et al., 2009).

The resulting principles were mapped against Herrington's (1997) elements of authentic learning to determine if any elements should be added, modified or eliminated (Appendix

17). The analysis indicated most *elements* of authentic learning that Herrington (1997) identified are still considered to be critical components for effective online learning, although some previously identified principles, such as editorial policy (see authentic context) and appropriate incentive structures (see collaborative construction of knowledge), were not specifically reflected in the current literature.

Contemporary literature placed more emphasis on social, cognitive and teaching interaction, multiple communication methods and technology literacy. Given the rapid advances in technology in recent years and our connected world of work, it was not surprising that including opportunities for learners to access a range of social technologies—to encourage interaction and support the development of a community of learners—were seen as important components for creating effective online learning environments. Garrison, Anderson and Archer’s (2000) Community of Inquiry (CoI) model, described in Chapter 2, was identified as a potential framework for integrating social, cognitive and teaching interaction and for guiding the selection of appropriate technological supports and resources for the online course.

The following draft framework for designing and implementing authentic online learning was derived from the literature analysis described above and in Chapter 2.

Draft principles: Authentic online learning framework

The draft framework, shown in Figure 9, is based on a holistic view of learning and teaching and incorporates a number of existing frameworks: learner needs (Partnership for 21st Century Skills, n.d.), elements of authentic learning and tasks (Herrington et al., 2010) and components of the Community of Inquiry (CoI) model (Garrison et al., 2000). Two key concepts that underpin the draft framework are: meaningful learning with technology (Jonassen et al., 2008) and using open educational resources (Hylén, 2006).

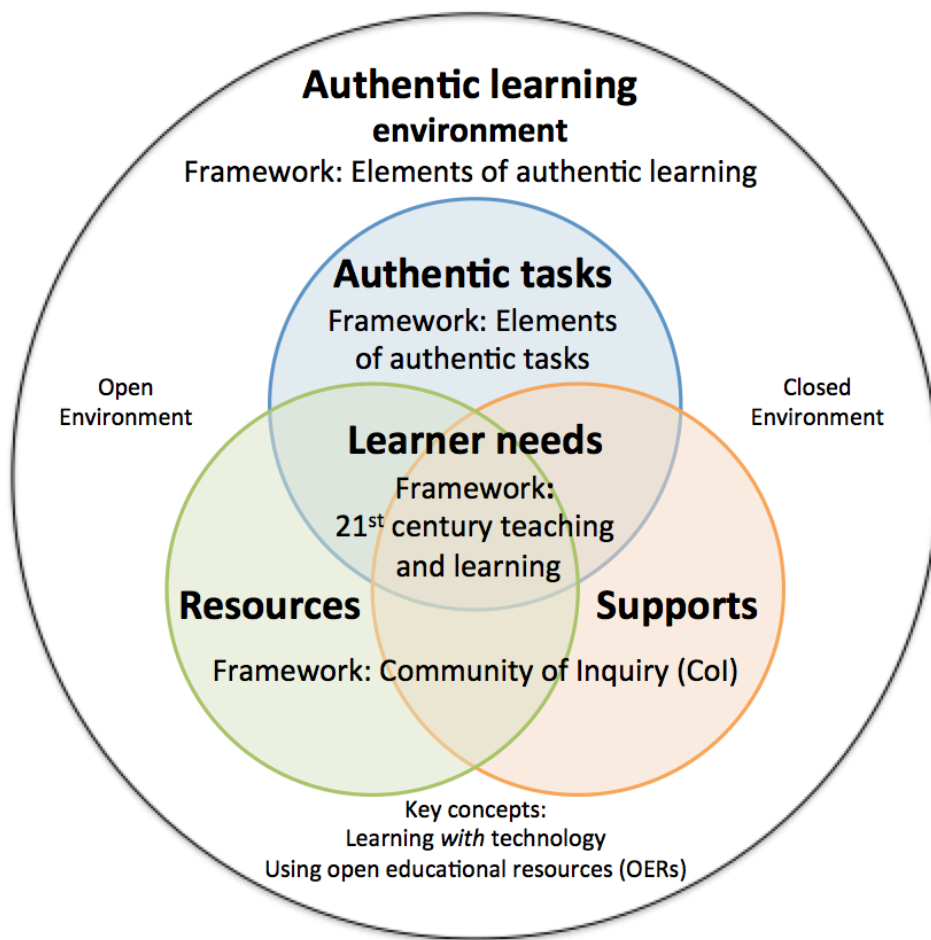


Figure 9: Draft framework - Authentic online learning (AOL)

The intention of the draft framework is to support the acquisition of higher-level knowledge and skills across three domains of learning: affective, cognitive and conative. The draft framework is comprised of five principles to assist educators to develop authentic, interactive and engaging online learning experiences:

1. *Learner needs*: Clearly articulate the course goals, target audience, and learning objectives to help learners identify if the course is appropriate for them
2. *Authentic learning environment*: Identify an authentic context and develop an environment that accommodates learners' privacy and encourages transparency and sharing
3. *Authentic tasks*: Create authentic tasks that enable learners to actively apply the attitudes, skills and knowledge to produce meaningful polished products as they would in real-work/life situations

-
4. *Learning resources*: Provide access to a range of social, cognitive and teaching resources and take advantage of the affordances of new web technologies and open educational resources
 5. *Learning supports*: Select pedagogical and technological supports to promote social, cognitive and teaching presence.

Appendix 18 lists each of the resulting draft principles, identifies guiding questions and provides generic suggestions for how each of the draft principles could be instantiated in the course design to develop an authentic online learning experience for students. The draft framework was used to guide the design of the *Authentic eDesign course*, an innovative authentic online professional development course for higher educational practitioners.

Course design

The design of the learning environment plays an important role as, “pedagogy and software design are closely intertwined in online learning – the ‘shape’ of the software can help or hinder the teacher in what they are trying to do” (Pedagogy, 2010, para. 14). A detailed explanation of each of the principles of the framework, and how they were instantiated as components in the course, are described in this section.

Component 1: Learner needs

The central component of the draft framework in Figure 9 is concerned with identifying and articulating learner needs for a specific course or unit (see Figure 10 below).



Figure 10: Draft framework - Learner needs

To design an environment to meet learner needs, educators first need to identify the aims and goals of the course, the intended target audience and the relevant student outcomes. These outcomes include:

- *Core subjects (3Rs) and 21st century themes:* Global awareness, financial, economic, business and entrepreneurial literacy, civic literacy, health literacy, environmental literacy
- *Learning and innovation skills (4Cs):* Creativity and innovation, critical thinking and problem solving, communication and collaboration
- *Information, media and technology skills:* Information literacy, media literacy and ICT literacy
- *Life and career skills:* Flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, leadership and responsibility.

How learner needs were instantiated in the course design

An extensive analysis was conducted to inform the development of the course goals, target audience and appropriate learning objectives for the course. These are discussed below, using the guiding questions listed in Appendix 18.

What is the aim/goal of the course?

The aim of the course was to assist higher education practitioners to plan and design interactive and engaging online learning experiences for their relevant field of study. The goal of the course was to provide higher education academics with the opportunity to: experience online learning from a student's perspective, learn how to use an authentic learning framework to design and implement their own courses, explore new technologies and network with their peers.

Who is the target audience?

Target participants were educators already involved in designing and delivering online courses within higher education or educators that would like to learn how to redesign an existing face-to-face course for an online environment. It was expected that most participants would have some prior teaching experience in the classroom or online and that they might have been familiar with authentic online pedagogies and technologies. However, for others this may have been the first time they were exposed to an online learning environment. The course needed to provide a range of supports and to cater for both novice and experienced online teachers.

What attitudes, skills and knowledge will students ideally have by the end of the course?

The course was designed to meet five intended learning outcomes that would help participants develop the authentic skills and knowledge involved with designing an interactive and engaging online course. Specifically, by the end of the course participants should be able to:

- Analyse learning objectives for their own online course to identify appropriate real-life learning contexts and tasks for a specific online course
- Select appropriate technologies for students to use as cognitive tools to achieve specified learning objectives
- Plan and design an effective online course using an authentic learning framework
- Create a detailed course outline for an authentic online course
- Evaluate an authentic online course outline and provide feedback for improving the proposed course.

Once the learner needs were identified and articulated, an authentic context and task needed to be identified to reflect the way the knowledge and skills would be used in real life.

Component 2: Authentic learning environment

Authentic learning is a process involving the dynamic interactions between the learner, the task and the environment (Herrington, 2006). This section describes the key features of the draft framework (Figure 9) for designing an authentic learning environment as illustrated in Figure 11 below.

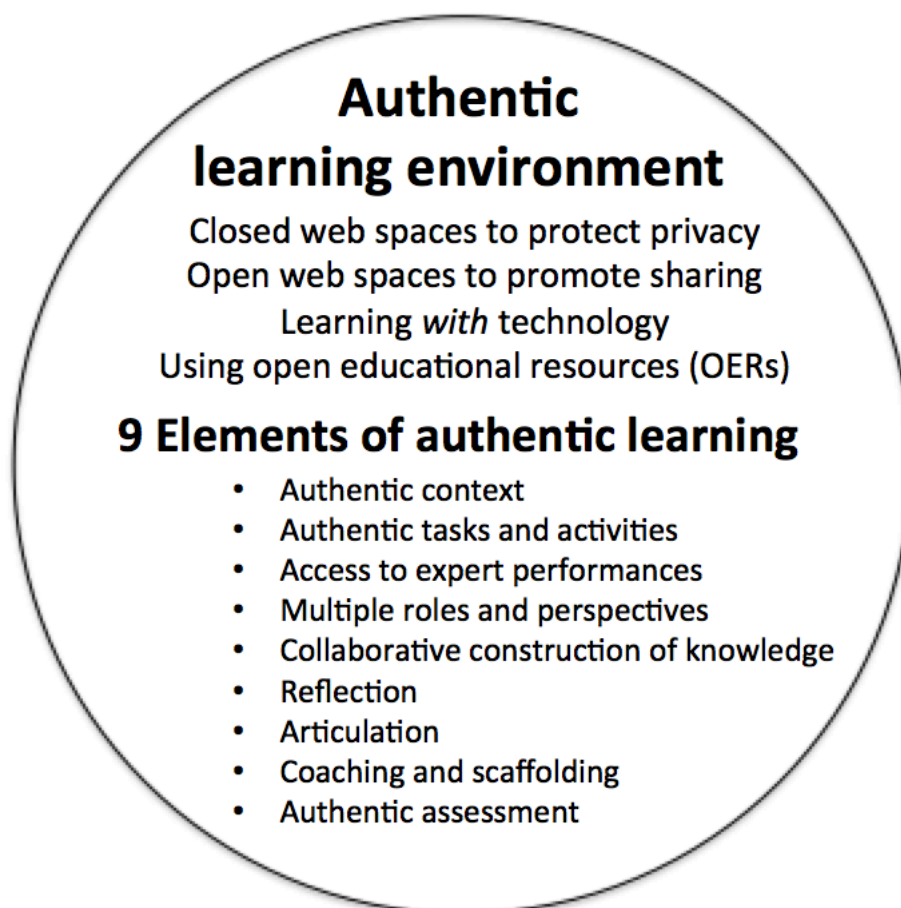


Figure 11: Draft framework - Authentic learning environment

Key features for designing authentic online learning environments

Herrington, Reeves and Oliver's (2010) nine elements of authentic learning, shown in Figure 11, were used to guide the overall design of the learning environment. Many of these principles are also incorporated in the two key concepts that support the framework: meaningful learning with technology and using open educational resources.

Key components of meaningful learning with technology identified by Jonassen, Howland, Marra and Crismond (2008) include:

- Cooperative (Collaborative / Conversational): social mediums to support learning by conversing
- Constructive (Articulative / Reflective): tools to support knowledge construction
- Authentic (Complex / Contextualized): authentic context to support learning by doing
- Active (Manipulative / Observant): tools to support learning by doing
- Intentional (Goal directed / Regulatory): Information vehicles for exploring knowledge to support learning by reflecting.

An overview of the roles of technology in education and how they can be used as cognitive tools to support meaningful learning is provided in Appendix 19.

Hylen (2006) suggests open educational resources can be used for the following areas:

- Learning content: full courses, content modules, learning objects, collections and journals
- Tools: development software, content development tools, content and learning management systems and online learning communities
- Implementation resources: publishing licences, design principles and localization of content.

How elements of authentic learning were instantiated in the course design

A description of the authentic learning context and the authentic online learning environment developed for the course is provided below, using the design questions listed above in Table 1. Evidence of how the elements of *authentic learning* were analysed and applied to the course design is shown in detail below in Table 1.

Table 1: Elements of authentic learning and how they were applied to the course

Authentic learning elements	Evidence of how they are implemented in the course
Provide authentic contexts that reflect the way knowledge will be used in real life	Learning context: A realistic scenario was provided to engage students in the creation of an authentic learning environment (Course information & learning guide, Context, p. 5).

Authentic learning elements	Evidence of how they are implemented in the course
Provide authentic tasks	Overall task: An authentic task that would be performed in the workplace was selected so that the final products participants produced could be used after the course in their own teaching programs (Course information & learning guide, Task, p. 5).
Provide access to expert performances and the modelling of processes	Guiding questions (analysis template) and examples of completed products (course outline and video) were provided to model the processes involved in analysing and designing an authentic course outline and demonstrate the expected level of performance. (Course information & learning guide, Support resources, p. 6).
Provide multiple roles and perspectives	Recommended readings provided different perspectives about the concepts. Participants were encouraged to source their own information, reflect on it and share their perspective with their peers via their blogs, discussion forums, Diigo comments and Skype chat. They also had access to a range of different completed examples that provided different perspectives about the end product they were expected to produce.
Support collaborative learning	Participants were required to review each other's work and provide feedback for improvements. They were also encouraged to read and comment on each other's blogs.
Promote reflection to enable abstractions to be formed	Participants were asked to also create a personal blog to record their reflections about their learning during the online PD course (Course information & learning guide, Specific requirements, p. 5).
Promote articulation to enable tacit knowledge to be made explicit	Analysis document, written course outline, 5-minute video presentation describing the course outline (Course information & learning guide, Specific requirements, p. 5).
Provide coaching and scaffolding by the teacher at critical times	The facilitator scaffolded the tasks as follows: 1/ Analyse your course requirements, 2/ Develop a written learning & assessment course outline & 3/ review a colleague's authentic course outline and provide them with feedback (Course information & learning guide, p. 5). Coaching included: Access to templates and examples of completed documents (analysis & course outline), links to tutorials (Course information & learning guide, Support resources, p. 6).
Provide for authentic assessment of learning within the tasks	Participants received feedback from the facilitator and their peers on the products they produced: analysis summary and course outline (Course information & learning guide, pp. 5-6).

What context might be possible and appropriate in an e-learning course to enable students to learn the knowledge, skills and attitudes of the course?

The context for this learning opportunity was in fact a real life situation where higher education educators were attending a professional development course to enhance their knowledge and skills for designing an online course. A detailed scenario for the learning context was included in the course information and learning guide (Appendix 20, CILG, p.

5). It was thought that the target audience would readily be able to identify with the proposed scenario and recognise it as an authentic context within which to learn new approaches to online learning.

What type of learning spaces would be most suitable for the authentic environment?

An independent Moodle LMS was selected as the hub of the learning environment as most universities use an LMS to deliver their online courses. An independent installation, rather than an institutionally based LMS, also enabled participants from different institutions to work together and access supports and resources from a central location. Two key concepts underpinning the draft framework are learning with technology and using open educational resources (OERs). Therefore, it was also important to include open web spaces to demonstrate how new web technologies and open educational resources could facilitate student learning.

In the initial iteration of the course a public website, called the *companion website*, was created using Google Sites to provide an open environment to house content, supports and resources that did not need to be protected. Using an open website also enabled participants to have access to content, resources and supports after the course was completed.

During the 2nd and 3rd iterations of the course the companion website was redeveloped into a *Technology Toolbox for Educators* and licensed under a Creative Commons license to avoid having to re-create a new website for each iteration of the course. It also provided the broader educational community with open access to a vast array of information, technologies and resources that could assist them to learn about: authentic learning, using technologies as cognitive tools and open educational resources.

Figure 12 illustrates the key features of the LMS and the open companion website for the 1st iteration of the course. Participants, shown in the centre of the diagram, first logged into the Moodle course, known as the *Authentic eDesign course*, using a participant ID and password provided by the facilitator. On first access they were prompted to change their password and were then taken to the online course. From the LMS they were able to access the *Authentic eDesign companion website* and a range of online social spaces on the World Wide Web, as indicated by the large block arrows.

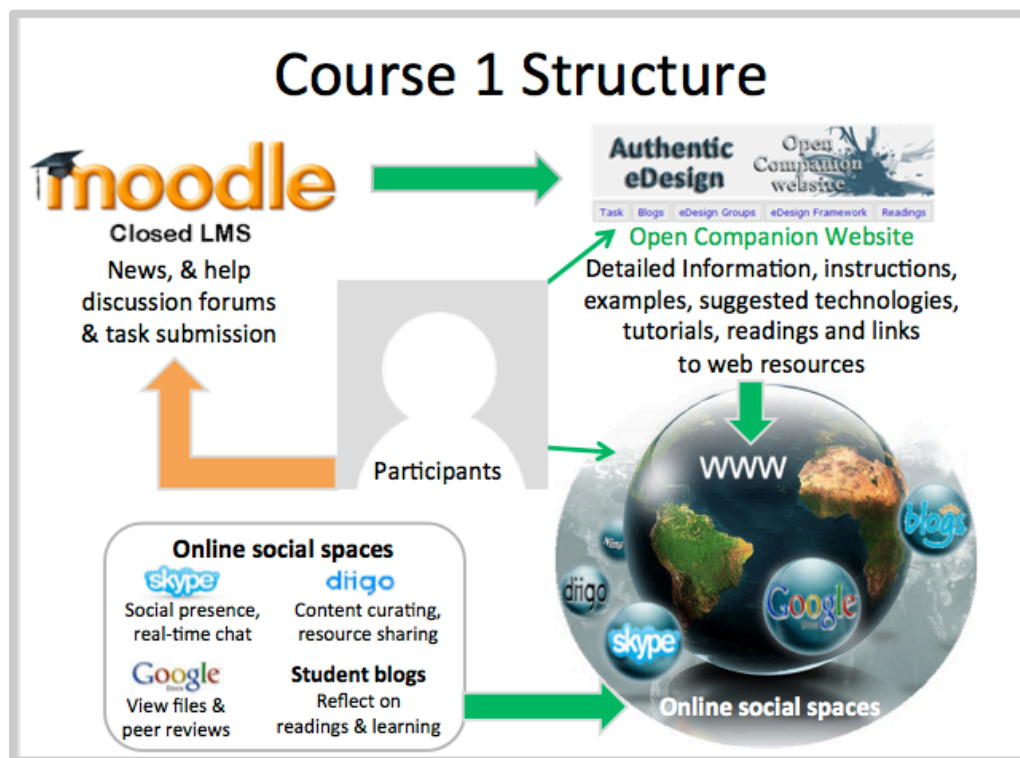


Figure 12: Iteration 1 - Course structure

Online social spaces included a Skype chat group, a Diigo social bookmarking group, student created blogs and a Google Drive folder. These were created to encourage participants to: connect, communicate and collaborate; explore new technologies; and discover how open educational resources could be used to support student learning. How these open spaces were used to support participant learning is described in Components 4 and 5 later in the chapter. The thin arrows in Figure 12 indicate participants could access these resources directly, if they wished to, after they had accessed the Moodle LMS.

What content, supports and resources need to be accommodated in a secure protected environment?

The LMS provided a secure space to store content of a private and confidential nature for the *Authentic eDesign* course. It acted as the central hub for course announcements, discussions and confidential feedback from the facilitator. It also acted as a launching pad for participants to access the open companion website.

What public websites could be used to store content and provide open access to learning supports and resources?

The *Authentic eDesign companion website* housed most of the course content and provided links to supports and resources. It included task instructions, timelines, sample completed tasks and links to suggested articles, resources, technologies and tutorials. Figure 13 shows the home page and navigation structure for the open companion website for the 1st iteration of the course.

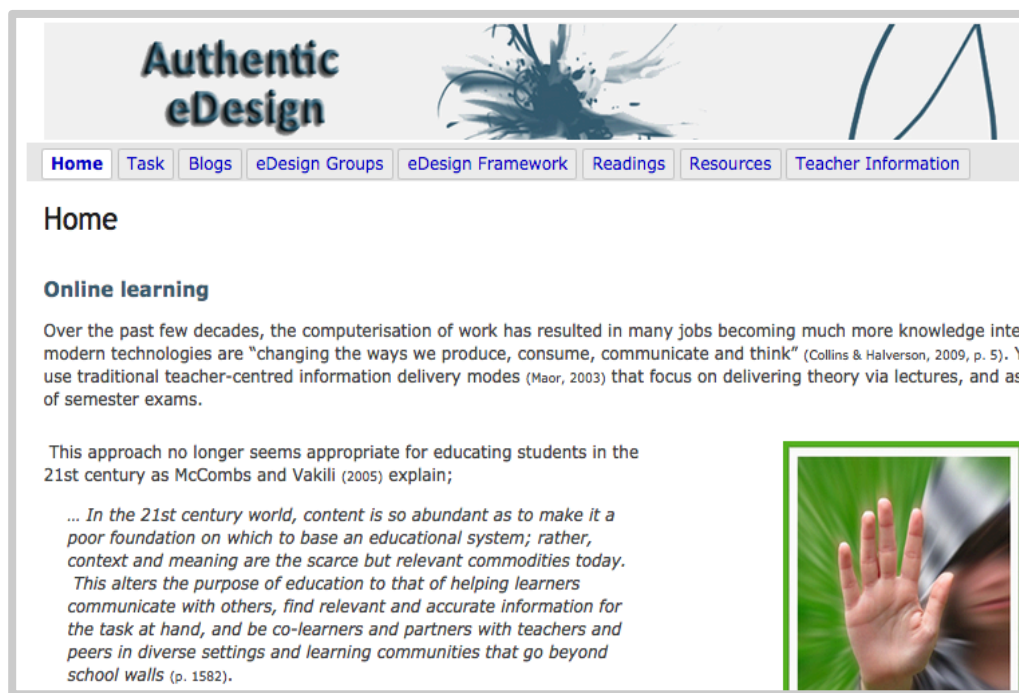


Figure 13: Iteration 1 - Authentic eDesign companion website

After the learning context and learning spaces had been selected, the next step was to identify an overall complex task that would enable participants to demonstrate the use of higher-level cognitive skills to achieve the intended learning outcomes.

Component 3: Authentic tasks

Authentic learning environments require students to complete complex real-world tasks over a period of time in collaboration with others as they would in a real workplace. Brown, Collins and Duguid describe authentic tasks as, “the ordinary practices of the culture” (1989, p. 34). It was important to create tasks that reflect how the activities would be performed in a real-world situation. Key features of authentic tasks that were incorporated in the draft framework are shown below in Figure 14.

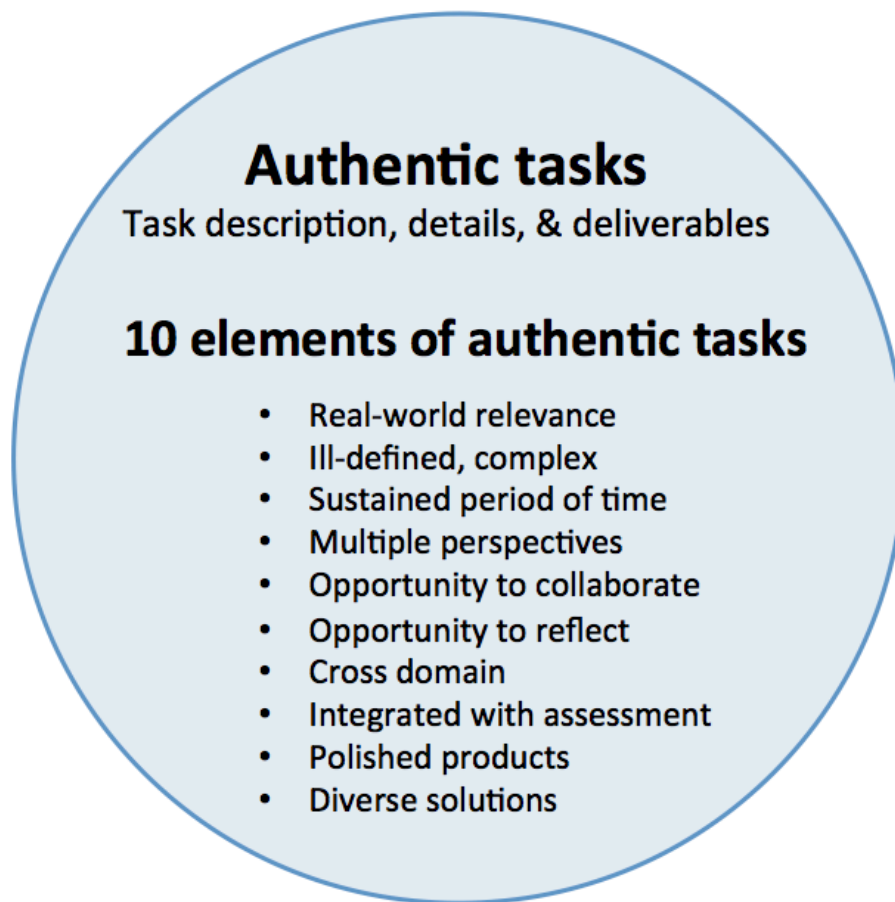


Figure 14: Draft framework - Elements of authentic tasks

How elements of authentic tasks were instantiated in the course design

Herrington et al.'s elements of authentic tasks were used to guide the development of the authentic course tasks. They were also used as a checklist to gauge the authenticity of the tasks (Table 2).

Table 2: Elements of authentic tasks and how they were applied to the course

Task elements	Explanation of element	Evidence of how the course tasks addressed each element
Real world relevance	Activities match as near as possible the real-world tasks of professionals in practice rather than decontextualized or classroom based tasks.	Participants were asked to create a course outline for an authentic online course in their own area of teaching. They were then required to present an overview of their course to their colleagues and provide feedback to a peer on their course outline.

Task elements	Explanation of element	Evidence of how the course tasks addressed each element
Ill-defined	Problems inherent in the activities are ill-defined and open to multiple interpretations rather than easily solved by the application of existing algorithms.	Participants were required to use their own area of teaching and analyse their course requirements. They then explore a range of pedagogies and technologies and determined the most appropriate for their course. There was no “correct solution” and participants needed to make many complex decisions to complete the task.
Complex tasks investigated over a sustained period	Activities were completed in days, weeks and months rather than minutes or hours, requiring significant investment of time and intellectual resources.	Tasks were completed over four consecutive weeks. A schedule was provided to help them plan their time. However, they were encouraged to read and explore the resources at their own pace as they progressed through the task.
Multiple perspectives / variety of resources	The task affords learners the opportunity to examine the problem from a variety of theoretical and practical perspectives, rather than a single perspective that learners must imitate to be successful.	Recommended readings were provided and participants were encouraged to reflect on the readings and share their understanding of the task concepts with their peers. The task also required participants to gain practical hands-on experience using a range of technologies and links to web sites, articles, videos and blogs created by a variety of educational professionals were available on the companion website.
Opportunity to collaborate	Collaboration is integral to the task, both within the course and the real world, rather than achievable by an individual learner.	Minimal collaboration was required as participants created their own unique course. However, they were asked to cooperate with and provide feedback to their peers. Participants were encouraged to join the course groups on Skype, Diigo, and Google docs that provided them with social spaces where they could work together and share their ideas and knowledge.
Opportunity to reflect	Tasks need to enable learners to make choices and reflect on their learning both individually and socially.	Participants were encouraged to reflect on the readings, their own work and their peer’s work throughout the course. They were also asked to reflect on their own skills and knowledge prior to and after the course.
Applied across different subject areas	Tasks encourage interdisciplinary perspectives and enable diverse roles and expertise rather than a single well-defined field or domain.	Participants needed to approach the task from a variety of perspectives such as: instructional designers, technology experts and educational professionals in order to create their authentic online course outline.

Task elements	Explanation of element	Evidence of how the course tasks addressed each element
Integrated with assessment	Assessment of tasks is seamlessly integrated with the major task in a manner that reflects real-world assessment, rather than separate artificial assessment removed from the nature of the task.	The course was task-based, so by completing the tasks, participants completed the course. There was no formal assessment, however, participants submitted their finished course outline document and video on Google Drive to obtain informal feedback from their peers and the facilitator.
Create polished products valuable in own right	Activities culminate in the creation of a whole product rather than an exercise or sub-step in preparation for something else.	The analysis activity contributed to the final course outline document, which was a polished end product that could be used in the participant's workplace.
Allow competing solutions & diversity of outcome	Tasks allow a range and diversity of outcomes open to multiple solutions of an original nature, rather than a single correct response obtained by the application of rules and procedures.	Each participant produced a course outline tailored to their individual area of teaching to suit their specific learning objectives.

Task description

The overall task required participants to produce a draft course (or unit) outline based on the authentic online learning framework for an existing or potential future course that they may revise or create to deliver online. To scaffold the learning, the overall task was divided into three sub-tasks: (1) analysing their course requirements and reviewing a peer's completed analysis, (2) writing their course outline and creating a video presentation to explain their course to their peers, and (3) reviewing one of their peers' completed course outlines and providing constructive written feedback.

Task details

To complete the task, participants were required to use a combination of analytical, conceptual, and social cognitive processes, and higher order thinking skills such as analysing, evaluating and creating. For Task 1, participants needed to analyse learner needs for their specific online course. They needed to clearly introduce their area of teaching, identify their target audience and articulate the intended learning outcomes for their course. They then uploaded their course analysis worksheet to Google Drive, reviewed one of their peers' completed analysis documents and provided constructive feedback.

For Task 2, participants were required to produce a word-processed course outline with headings to clearly identify the relevant sections, save it as a PDF file and upload it to Google

Drive. They were also asked to create an online video to provide an overview of their course for their peers. In the final task, Task 3, participants were asked to review one of their peers' course outlines and video and provide them with constructive written feedback. Detailed instructions for completing the tasks were provided in the course information and learning guide (Appendix 20).

A blog activity was also included in the course to assist participants to reflect on and articulate their thoughts about the learning concepts, the recommended readings and their personal learning journey throughout the course. Participants were encouraged to read and comment on their peers' blogs to help them make meaning of, and develop a shared understanding of the concepts covered in the course.

Task deliverables

The *Authentic eDesign course* was a non-accredited professional development opportunity and no formal assessments were included. However, for each task, participants produced realistic products to demonstrate their learning, such as: Task 1 – a written analysis; Task 2 – a course outline and an online video; and Task 3 – an evaluation report. At the completion of each task, participants received formative feedback from both their peers and the facilitator. Figure 15 illustrates the relationship between the learning objectives (deliverables) and the tasks for the 1st iteration of the course.

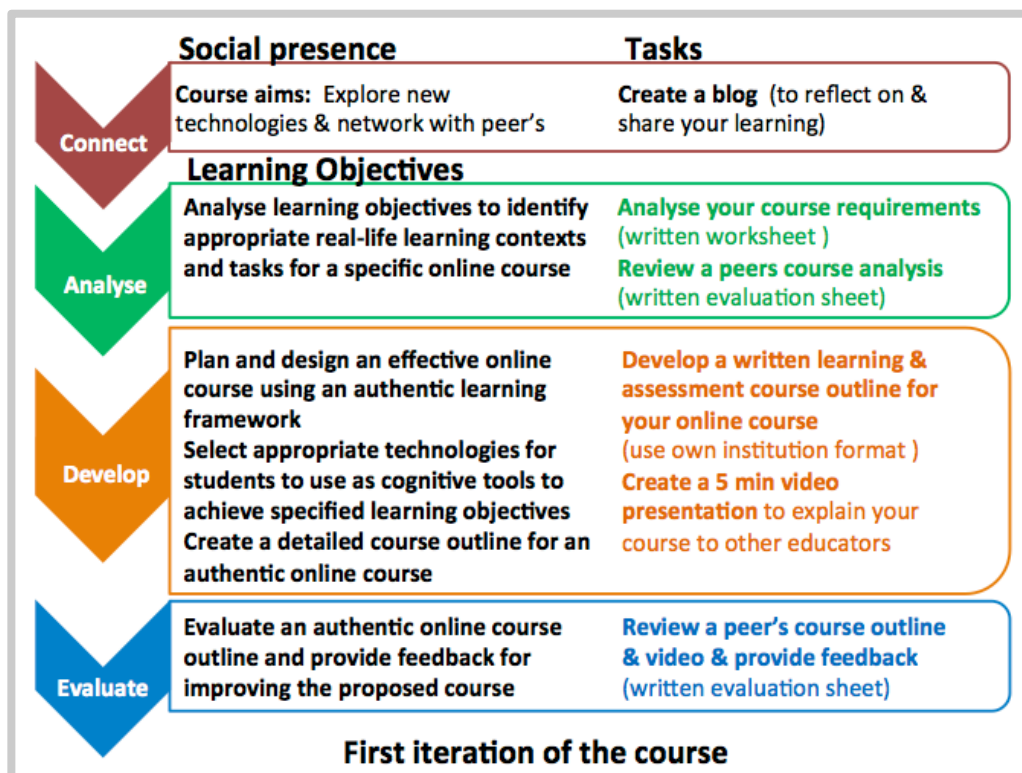


Figure 15: Iteration 1 - Mapping of learning objectives with tasks

Once the authentic task was identified, appropriate pedagogical strategies, resources and supports that could assist learners to successfully complete the tasks needed to be selected. Strategies and resources used to support participant learning are discussed in the following section.

Components 4 & 5: Learning strategies, resources and supports

In the draft framework (Figure 9) all components are interconnected. Thus, the frameworks and key concepts that underpin the *draft authentic learning framework* (identified in the centre of Figure 16 below), needed to be taken into consideration when selecting learning strategies, resources and supports.

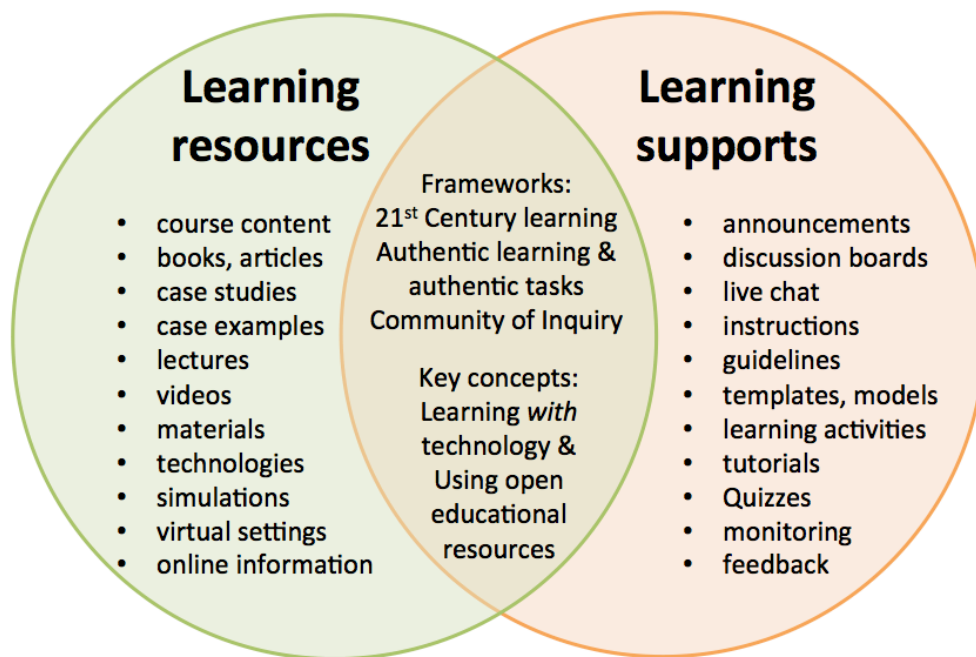


Figure 16: Draft framework - Learning strategies, resources and supports

To create an authentic learning environment it was important to include resources and supports that people use in their everyday lives to promote the development of social, cognitive and teaching presence (McLoughlin, 2014), and encourage learners to use technologies to connect, communicate and collaborate with their peers and the broader community to help prepare them for the 21st century workplace.

Social, cognitive and teaching presence

Garrison, Anderson and Archer's *Community of Inquiry* (CoI) model (2000) provides a holistic view of teaching and learning that can assist educators with the selection of pedagogical strategies, technologies and other online learning resources and supports. The model, "assumes that learning occurs within the community through the interaction of three core elements" (Garrison et al., 2000, p. 88): social, cognitive, and teaching presence, and that higher-order learning is best supported in a community of earners engaged in critical reflection and discourse.

Learning resources

In authentic learning environments, learners are not explicitly "told" which resources they must use; rather they are encouraged to explore independently a variety of different resources and to choose the resources that best fit their needs (Pan & Hawryszkiewicz, 2004). It was important to provide learners with access to a range of different types of

resources to assist their learning and enable them to successfully complete the required tasks. Learning resources may include: course content, textbooks, articles, case studies, case examples, lectures, videos, learning materials, technologies, simulations, virtual settings and other online information (Herrington et al., 2010).

The course resources were primarily a combination of links to existing relevant open educational resources created by experienced educators and contextualised materials created by the facilitator and licensed for reuse. Most resources were stored on, or linked to, the *Technology Toolbox for Educators* website that is publically available on the Internet for any educator or student to consult. Participants were encouraged to explore the resources on the website and use the learning supports provided to assist them to make sense of the concepts covered in the course and to reflect on how technologies could be used as cognitive tools to support student learning in their own courses.

A key reason for using open educational resources was to provide participants with ongoing access to valuable resources that they could use in their own teaching beyond the course itself.

Learning supports

Learning support is defined as, “any activity beyond a college program’s prescribed content that contributes to individual student’s attendance, retention, learning and achievement” (Learning Support Centers in Higher Education, 1998-2015). Learning supports may include: announcements, discussion boards, live chat, instructions, guidelines, templates, models, learning activities, tutorials, quizzes, monitoring of student progress and/or discussions, feedback on participation, progress and assessments (Herrington et al., 2010).

Authentic learning environments encourage learners to take control of their learning and to explore the problem or task at hand from multiple perspectives. However, as many learners do not have the skills to learn independently, it is important to include learning supports to guide their learning and support the construction of new knowledge and skills (Pan & Hawryszkiewicz, 2004).

The three core elements of the CoI model: social, cognitive, and teaching presence, were used to group the resources and supports selected for the course. Appendix 21 provides an overview of the learning resources and supports categorised by the CoI elements. How the strategies and resources were instantiated in the course design to support social, cognitive and teaching presence are discussed in the following sections.

Strategies instantiated in the course design for supporting social presence

In the *Getting started* section, at the beginning of the Moodle LMS, participants were asked to update their Moodle profile with a brief personal biography and attach a photograph (optional). An introduction forum was also included in the *Getting started* section and participants were encouraged to use this forum to introduce themselves to their peers and the facilitator. To encourage emotional expression, they were asked to share something, “unusual about themselves or an object they owned” with their peers. However, they were also advised to share as much or as little about themselves as they felt comfortable with. The facilitator posted the first discussion post and revealed some personal information about herself to provide an example of the type of information they might like to share and to set the scene (tone) for the discussion.

Interaction was enabled through the development of a combination of synchronous and asynchronous communication spaces. Synchronous and asynchronous technologies complement each other as they facilitate different forms of communication. Synchronous technologies are better suited for developing rapport and community building (social presence) as they are similar to face-to-face conversation. Asynchronous technologies are better for supporting the development of cognitive presence as they allow learners time to explore complex content-related issues and reflect more deeply on the content and concepts before articulating their thoughts and knowledge (Hrastinski, 2008).

Synchronous real-time communication spaces included: a Skype chat group and Google Drive (file comment tool). Asynchronous spaces included: discussion forums, blogs, Diigo (a social bookmarking site for resource sharing) and email addresses. Using different forms of communication also allowed participants to choose their preferred method for sharing their thoughts and ideas with their peers and/or the broader community. Links to information about these collaborative spaces, how to download the relevant software and how to join the group spaces were also included in the getting started section on the Moodle hub.

The initial course design also included a blog activity to support both social and cognitive group interactions. From a social perspective, participants were encouraged to use their blog to reflect on their online learning experience and to share their thoughts and feelings with their peers. They were also encouraged to comment on other participants’ posts.

The cognitive aspect of the blog activity and other strategies for promoting and supporting cognitive presence are discussed in the following section.

Strategies instantiated in the course design for supporting cognitive presence

Cognitive presence focuses strongly on the construction of meaning that requires learners to use higher order thinking skills. Learning supports and pedagogical strategies instantiated in the course were largely concerned with assisting participants to analyse and synthesise information from a variety of resources, and encouraging them to reflect on and discuss their understanding of the concepts, knowledge and skills required to complete the course tasks.

Analysis and synthesis – A Google Drive folder was created to enable two-way uploading and sharing of participant work. This technology allows multiple users to access and edit a single document at the same time, which can support social collaboration and collaborative construction of knowledge. A range of files were uploaded to the Google Drive folder that participants could use to assist them with the course tasks. The files included:

- A course analysis template to assist learners to analyse their own course objectives, context and tasks, and a peer evaluation (Appendix 22);
- A peer evaluation template for Task 1 to enable learners to analyse, reflect on and provide feedback to each about their course analysis (Appendix 23);
- A peer evaluation template for Task 2 to assist learners to provide feedback to their peers about their draft course outline (Appendix 24).
- Examples of completed documents for each of the course tasks.

Reflection and discourse – Students used a range of applications such as: blogs, discussion forums, real-time chats and social bookmarking to reflect on and discuss the course learning concepts and tasks to enable collaborative construction of knowledge. A Diigo social bookmarking site was included to provide links to relevant readings and to demonstrate how it could be used to help organise and manage online resources.

Learners selected their own blog platform to create their reflective journals and added the URL to a Google spread sheet stored in the course folder. Both the facilitator and peers could then access all blogs through this file. The facilitator also used this file to allocate partners and manage the peer review process.

Strategies instantiated in the course design for supporting teaching presence

The course plan included an introduction to the course by email and a video introduction and welcome on the Moodle LMS. Due to the nature of the task, participants worked largely on their own and to their own schedule. However, a study schedule was included in the course information and learning guide (Appendix 20, CILG p.3) as an indication of the time they

might devote to the course activities in order to complete the assessment tasks by the due dates. A downloadable progress checklist (Appendix 25) was also available on Google Docs to help learners track their progress.

Jing, a free screen capture and screen casting application was used by the facilitator to create short personalised just-in-time screencasts (licensed under Creative Commons licenses) in response to learner questions and to fulfil specific learning needs as they arose. The facilitator also provided confidential personalised feedback directly to participants on their finished products using the track changes feature in Word.

Prior to implementing the course the designer completed a self-evaluation checklist to gauge the authenticity of the *Authentic eDesign course* (Appendix 26).

Conclusion

This chapter described the draft framework that was developed to help guide the design of the course, the five components of the framework and how they contributed to designing interactive and engaging learning environments and how components of the framework were instantiated in the proposed learning solution. By the end of Phase 2 of the design-based research study, a learning environment had been designed and created—based on consultation with practitioners and an analysis of literature and theory—ready to be implemented and evaluated in Phase 3.

The next chapter describes how the learning solution was implemented and tested, and explains how subsequent iterations of the course were modified in an endeavour to improve the student learning experience.

Iterative cycles of implementation and testing of the learning solution

In Phase 3 of the study, the learning solution was implemented in three iterations and data were collected (with ethical approval) and analysed to identify areas that could be improved in subsequent iterations as part of the design-based research.

Chapter 4 described the research methodology, ethics and target participants. This chapter describes how the intervention, an online professional development course for higher education practitioners, named the *Authentic eDesign course*, was implemented in three iterative cycles.

Three iterative cycles

The aim of the *Authentic eDesign* course was to provide higher education practitioners with the opportunity to: experience online learning from a student's perspective, learn how to use an authentic learning framework to design their own authentic online courses, explore new technologies and network with their peers.

Each course was advertised via university networks and educators self-selected to participate. The online course ran for five consecutive weeks, including one week prior to the commencement of each iteration, to enable learners to familiarise themselves with the learning environment and to download the social media software they would be using throughout the course.

One of the major features of a design-based research approach is implementing iterative cycles and gathering data to improve the intervention. The course was implemented three times over a two-year period. Data collected from each iteration was analysed and modifications were made to the course before subsequent iterations were implemented.

Data collection methods

The following data collection methods were used for all iterations of the course: a background survey (conducted before each course), a prospective teaching survey (conducted at the end of each course), an anonymous course evaluation survey (completed at the end of

each course), facilitator reflections (documented during each course) and participant artefacts and comments made during the normal progression of each iteration of the course.

Data coding and analysis

At the end of each iteration of the course, participant feedback and tutor reflections were analysed to identify areas for improvement for subsequent iterations. Data were coded and analysed using Glaser and Strauss's (1967) constant comparative method of quantitative analysis. This joint coding and analysis method enabled the data to be systematically categorised and analysed using consistent methods.

The data was first coded under a priori themes derived from the elements of authentic learning. Then Garrison et al.'s (Garrison, Cleveland-Innes et al., 2010) Community of Inquiry coding template (Table 3) was used to categorise the themes and perceptions of the social, cognitive and teaching features incorporated in the course to support student learning.

Table 3: Garrison, Anderson & Archer's Community of Inquiry coding template

Elements	Categories	Indicators (examples only)
Cognitive presence	Triggering event Exploration Interaction Resolution	Sense of puzzlement Information exchange Connecting ideas Applying new ideas
Social presence	Emotional expression Open communication Group cohesion	Emotions Risk-free expression Encouraging collaboration
Teaching presence	Instructional management Building understanding Direct instruction	Defining and initiating discussion topics Sharing personal meaning Focusing discussion

Use of pseudonyms

Most data sources (e.g., background survey, prospective teaching survey, blog posts, Skype posts, email correspondence etc.) identified the research participants, therefore pseudonyms were used to protect their identity. Example coding: (AW-1), where AW is the pseudonym and 1 is the course iteration number. For the anonymous online course survey, pseudonyms were not required. The coding applied to survey responses reflects the respondent ID number and the course iteration number. Example coding: (Respondent 3-2), where 3 is the respondent ID and 2 is the course iteration number. The themes and recommendations for improving each iteration of the course are discussed in detail below.

Participant profile

Participants were asked to complete a background survey before the course that included questions designed to elicit demographic information and their prior online teaching experience. This demographic information was used to build a profile of the participants enrolled in each course. Table 4 provides an overview of participants enrolled in each iteration and a summary of all participants.

Table 4: Participant profiles by course iteration and a total summary

Profile questions	Criteria	Course iteration			Total
		#1	#2	#3	
Number of responses		11	10	41	62
Q1 Gender?	Female	73%	80%	71%	73%
	Male	27%	20%	29%	27%
Q2 Age range?	23 – 26	0%	0%	2%	2%
	27 – 32	18%	0%	15%	13%
	32 +	82%	100%	83%	85%
Q3 Student cohort?	Uni Preparation	18%	20%	10%	13%
	Undergraduates	45%	40%	54%	50%
	Post Graduates	55%	10%	41%	39%
	Staff Development	55%	60%	29%	39%
	Other	0%	0%	2%	2%
Q4 Years in teaching?	Less than 1 year	9%	0%	7%	6%
	1-3yrs	0%	0%	10%	6%
	3 to 5 years	27%	20%	10%	15%
	5 to 10 years	27%	30%	34%	32%
	More than 10 years	36%	50%	34%	37%
Q6 Have you designed and/or delivered an online course?	Yes	82%	80%	46%	58%
	No	18%	20%	54%	42%

Eleven people in the 1st iteration, 10 people in the 2nd iteration and 41 people in the 3rd iteration of the course completed the participant background survey conducted at the beginning of each course. The majority of participants were female (73%), which was not unexpected as there is commonly a higher proportion of female academics within schools of education in Australia. Most participants (85%) were over 32 years of age.

A significant percentage of participants had more than 5 years' teaching experience (69%) and over a third had 10 or more years' experience (37%) working within a teaching-related

position. Over half of the participants (58%) had designed and delivered online courses prior to undertaking the course. The majority of participants (89%) were lecturers or tutors for undergraduate (50%) or postgraduate courses (39%). Others worked in learning development centres where their primary role was staff development (39%) or as lecturers in university preparation courses (13%).

Reasons for participating in the course

The aim of the course was to provide participants with the opportunity to: use an authentic learning framework to create interactive and engaging online learning experiences, experience online learning from a student's perspective, explore new technologies and network with their peers. Responses about why participants undertook the course closely aligned with the course aims. Therefore, the course aims were used as *a priori* themes to classify responses as shown in Table 5.

Table 5: Reasons for participating in the course

Q5 Why do you want to do this course? Note: some participants provided more than one reason	Course iteration			Total
	#1	#2	#3	
Number of responses	11	10	41	62
Improve online learning knowledge and skills	55%	30%	66%	58%
Create more effective online learning experiences	27%	30%	37%	34%
Explore new technologies	9%	40%	12%	16%
Create more authentic online learning experiences	9%	20%	10%	11%
Experience online learning from a student perspective	9%	10%	7%	8%
Network with peers	18%	10%	0%	5%
Non-specific (e.g., course is going online)	0%	0%	7%	5%

Participant responses indicated that the primary reasons for undertaking the professional development course were: to develop their online learning knowledge and skills (58%) and to explore ideas about how to create more effective online courses (34%).

Improve online learning knowledge and skills

It is common for higher education practitioners to design and implement online courses without any prior experience or training in online pedagogies or technologies. Some participants saw this course as a timely professional development opportunity to develop their skills and re-design their existing courses. One participant stated:

To date I have been mostly self-taught so the opportunity to engage in this course is too good to be true (SB-3).

Another said:

I've taught an online unit twice over the past 2 years and had no experience or training about how to do it so thought this course would give me the opportunity to learn more and revamp the unit for next year (HD-2).

Some people did not reveal whether they had received prior training or not, but it was evident they were keen to improve their existing knowledge and skills. One person stated she was “looking for new research and ideas that may help improve my education design skills” (FB-3). Another person, who had already designed and delivered online, was interested in learning about alternative pedagogical approaches:

I've already developed an online unit. It was a little rushed and followed a standard approach. I'm interested in further developing my skills in the area of online learning and trying different approaches (KM-1).

Create more *effective* online learning experiences

Another reason participants cited for enrolling in the course was to gain ideas about how to design or redesign their online courses to create more *effective* learning experiences for their students. One participant wanted to learn strategies and technologies for engaging students:

To learn effective and engaging ways to design and implement online courses with learning strategies and technologies that engage students more productively (EC-2).

Another indicated if she could improve one course, she could put a case to management for resources to improve her other courses:

I want to redesign my existing courses to be more interesting and engaging but I'm not sure where to start or how to go about it. If I can get this unit improved, I will be able to make a case to be allowed time/resources to completely revamp another unit (HS-1).

Explore new technologies

A number of people indicated that exploring how new technologies could be used to support online learning drew them to the course. In particular, participants with little or no knowledge of online technologies wanted to learn about simple tools that could be used to support student learning:

I really do not understand how technology can help with teaching and learning without it taking up inordinate amounts of time to set up and use. I would like to have some easy tools that help, not hinder, learning (GS-1).

Others were keen to explore technologies for specific purposes, such as to gain, “new ideas on collaborative activities and new technologies in online learning” (RS-2), or how to engage with their online students, “using new tools and techniques” (MA-3).

Create more *authentic* online learning experiences

Some people were specifically attracted to the authentic learning framework to learn how to create meaningful, real-world learning experiences. For example, one person advised that she wanted, “to create authentic eLearning courses and convert existing course activities into authentic activities” (IK-2). Another indicated she wanted to learn how to design an online course to make it more relevant for students because, “there is a real need in a business course to focus on authentic tasks and collaborative learning” (JF-2).

The following statement indicated educators are keen to create more useful and meaningful (RC-3) courses that can better prepare students for the workplace after they graduate:

I teach within the energy studies program and over 70% of our students are external. I want to ensure that they have the best experience in learning and in particular learning by solving problems that they are likely to encounter in the workplace after they graduate. i.e. authentic learning (JW-3).

Experience online learning from a student perspective

Experiencing online learning from a student perspective was also of interest to a few participants. One person stated:

I am interested to try the course from a student perspective to see how well I can participate in an online course (RS-2)

Another thought the course would assist her, “with understanding student issues” (AF-3). Despite intrinsic motivations for undertaking professional development, educators face many barriers in developing online learning knowledge and skills, such as high-workloads, technology infrastructure, technology skills, online teaching confidence and family issues (Tomte & Sutherland Olsen, 2014).

Attrition from the course

High drop out rates have plagued online learning since the beginning of distance education (Adamopoulos, 2013). According to Maor and Volet (2007a), it is not uncommon for attrition rates to range from 13.5% to 75%. With the rapid growth in online learning there has also been a corresponding decline in retention rates (Brown & Hughes, 2014) and recent studies indicate the larger the cohort the higher the drop out rate, with some online courses

experiencing over 90% attrition (Clow, 2013; Daniel, 2012; Kizilcec, Piech & Schneider, 2013; Laaser, 2014).

Several people withdrew from each iteration of the course and a summary of the reasons given for withdrawing from the course is identified in Table 6.

Table 6: Reasons for withdrawing from the course

Reason for withdrawing (Data source: Email correspondence)	Course iteration			Total
	#1	#2	#3	
Lack of time due to high workload	67%	29%	83%	81%
Technology issues	0%	0%	11%	8%
Change of employment	0%	14%	0%	4%
Another training course	0%	0%	6%	4%
No reason provided	33%	57%	6%	4%

Most cited lack of time due to high workloads (81%) as the primary reason for withdrawing, which is consistent with the literature (Maor & Volet, 2007a; Zheng, Rosson, Shih & Carroll, 2014). One participant wrote:

We are a little bit under the pump at the moment, I am writing a whole new unit (AW-1).

Another advised:

Very sorry I haven't done much with the online course ... I thought this would be a chilling period for me before semester but admin and setting up two new master programs turn out to be eating up my time (CK-3, Email).

Lack of institutional support made it difficult for some participants to find time to complete the course. One person commented:

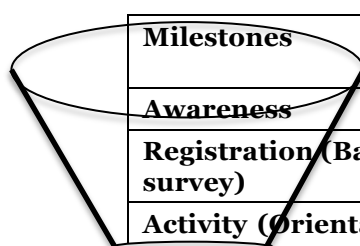
Yes, I have fallen behind. [My colleague] managed to have 4 paid hours in his workload to partake in your PD. But to do it in unpaid overtime is the challenge (RM-2).

Despite their lack of time due to a variety of reasons such as, taking a new role (MA-1), running an intensive week teaching an MBA unit (GS-1) and teaching an Open University Australia unit that runs back to back with no breaks (EC-1), it was evident that practitioners who withdrew early from the 1st iteration of the course were keen to learn about authentic pedagogies and new technologies as four of the five people that withdrew asked to be enrolled in the next course.

Key milestones and participation

The course consisted of several key milestones that can be used to gauge learner participation throughout the course. Clow's (2013) funnel of participation model was used to illustrate the key milestones and learner participation in each iteration of the course. Clow's model identifies four stages of participation: awareness, registration, activity and progress and he suggests that the funnel can be extended in granularity to suit specific learning contexts. Table 7 below illustrates the key milestones for the course and learner participation based on Clow's model.

Table 7: Key milestones and participation based on Clow's funnel of participation



Milestones	% Completed by course iteration		
	#1 %	#2 %	#3 %
Awareness			
Registration (Background survey)	100%	100%	100%
Activity (Orientation activities)	55%	80%	68%
Progress			
Task 1 – Course analysis	55%	40%	32%
Task 2 – Course outline	55%	40%	12%
Prospective teaching survey	55%	40%	22%
Course evaluation survey	45%	30%	17%

For the purpose of this study, the registration category (i.e., the number of people who commenced the course) was the completion of the participant background survey. The activity category (i.e., the number of people who actively participated in the course) was the completion of the online orientation activities. The progress category (i.e., the number of people who progressed through the course tasks) was the completion of four milestones: Task 1, Task 2, prospective teaching survey and the course evaluation survey.

According to Clow (2013), there is typically a significant attrition in numbers between each stage of the model. In this study, a significant attrition was evident between the registration and activity stages in all iterations of the course. In the 1st iteration, eleven people completed the background survey and six people completed the orientation activities (45% attrition). In the 2nd iteration, 10 people completed the background survey and eight people completed the orientation activities (20% attrition). In the 3rd iteration, 41 people completed the background survey and 28 completed the orientation activities (32% attrition).

There was also a significant attrition between the activity and progress stages in both the 2nd (50%) and 3rd (47%) iterations of the course. It was interesting to note that there was no attrition between these stages for the 1st iteration. There is no conclusive evidence to explain this difference in the 1st iteration. However, the data analysis related to social presence—discussed in the following chapter indicates participants in the 1st iteration developed a good level of rapport and group cohesion that may have contributed to their motivation to complete the course.

Clow (2013) does not discuss whether it is common to see a significant attrition between components within a particular stage of the model as he does not delve into this level of granularity. A study conducted by Zenos et al. (2002) indicated that students who submitted the first two assignments generally completed the course. Although Koller (2012) reported that in large open online courses only about 30% of people who submit the first assignment also submit the final assignment. In this study, in both the 1st and 2nd iterations of the course, all participants that submitted Task 1 also submitted Task 2 and completed the prospective teaching survey (55% and 40%). It also appears that most of these participants also completed the anonymous course evaluation survey (45% and 30%).

In the 3rd iteration, the data indicates there was a substantial attrition rate within the progress stage between Task 1 and Task 2 (20%). However, despite not submitting Task 2, it is evident that a few of the learners that submitted Task 1 were active until the end of the course, as more people completed the prospective teaching survey (22%) and the course evaluation survey (17%) then submitted Task 2 (12%).

According to Zheng (2014) perceptions about what counts as “finishing” a course may vary between participants and the facilitator. For the purpose of this study, “finishing” was deemed to be the submission of the Task 2 course outline. Six participants (55% - 1 male & 5 female) finished the 1st iteration, four participants (40% - all female) finished the 2nd iteration and five participants (12% - all female) finished the 3rd iteration of the course. Zheng et al. (2014) suggests that course incompleteness is not necessarily problematic, as some students that leave before the course ends do so because they have already learned what they wanted. In this case, it appears that course incompleteness was not an issue for some participants, as the following quotes indicate that they took away ideas and skills that they could apply to their own online courses:

I really found the resources and looking at others application of the principles helpful in developing materials for the year (JD-3, Email).

I have never been involved with online courses before, so I was able to learn and experience tools and strategies (GM-3, Prospective teaching survey).

Apologies for not completing the course: as to be expected I became top-heavy with my teaching load. I very much enjoyed the readings and I can say the whole experience changed my perception of online teaching and learning (JM-3, Email).

Although many participants did not complete all course tasks, the above quotes indicate that having the opportunity to experience online strategies and technologies in action had a positive effect on changing the way they think about online learning.

The following section discusses the structure of the course, of the 1st iteration, participant feedback and facilitator reflections about what worked well and what might be improved and a summary of modifications made to the course before the second implementation.

Iteration 1 of the course

The 1st iteration of the course was implemented during the January summer break and ran for five consecutive weeks. A welcome email was sent to all participants one week prior to the course. The email included a copy of the course information learning guide and instructions about how to access and login to the LMS. Participants were also advised they would need to dedicate approximately three hours a week to complete the course. The course structure for the 1st iteration is shown below in Figure 17.

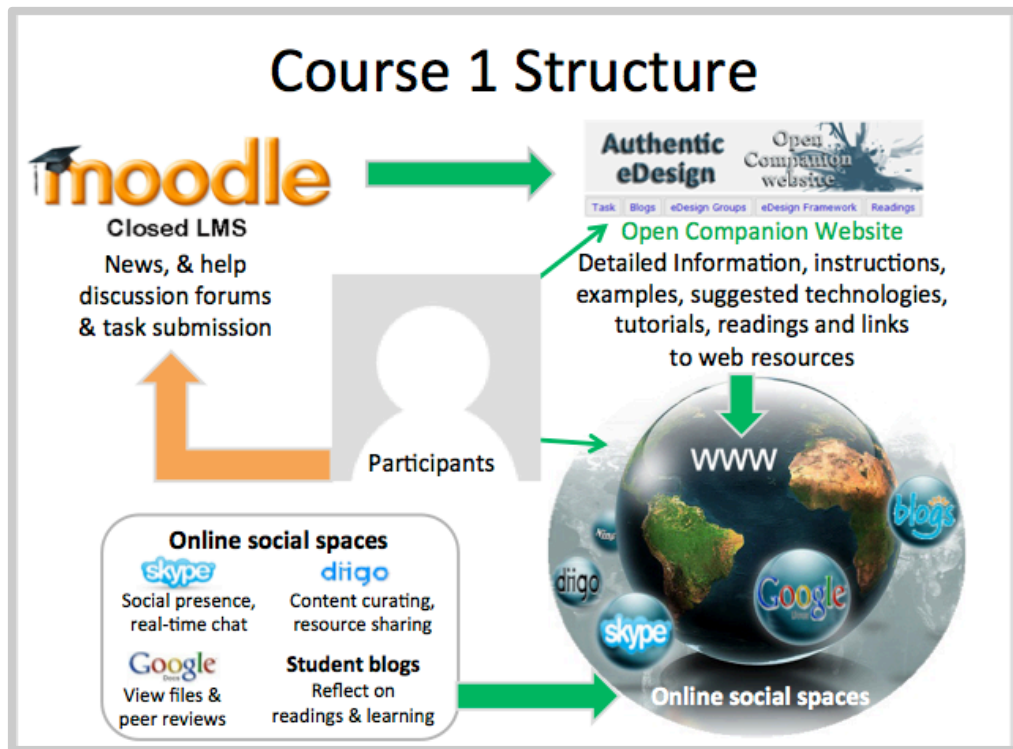


Figure 17: Iteration 1 - Course structure

Participants (middle image) first logged in on the Moodle LMS using the login and password details provided by the facilitator. The LMS (closed environment) contained a news forum, a number of discussion forums, basic information for getting started in the course, task submission tools and links to the open companion website.

They could then access the open companion website that included detailed information and instructions to help learners complete the course tasks, examples of completed tasks, links to readings, web resources and the courses online social spaces (Skype, Diigo and Google Docs). After participants had logged in on the Moodle LMS they could bookmark the URLs for the open companion website and social spaces to access them directly if they wished. The green arrows show the flexibility of movement through the various elements of the course environment.

Eleven people commenced the course (9 female & 2 male) and six participants comprising three lecturers (2 female & 1 male) and three teaching and learning staff members (all female) from two universities in Western Australia completed the course. These six participants completed the prospective teaching survey and five participants completed the anonymous online course evaluation survey. The following section discusses participant

feedback received in regards to the design and implementation of the 1st iteration of the course.

The following data collection methods were used for all iterations of the course: a background survey (conducted before each course), a prospective teaching survey (conducted at the end of each course), an anonymous course evaluation survey (completed at the end of each course), facilitator reflections (documented during each course) and participant artefacts and comments made during the normal progression of each iteration of the course.

Participant feedback

Participant feedback about the design and implementation of the course was sourced from the anonymous online course evaluation survey that participants were requested to complete at the conclusion of the course. The *course evaluation questionnaire* (Appendix 14) included two open questions to gain feedback about what they thought were the best aspects of the course (Q38) and what areas they thought could be improved (Q39).

In response to question 38 (Table 8) participants identified a number of elements relating to teaching presence. This suggests that teaching presence (75%), in particular played an important role in supporting their learning.

Table 8: Iteration 1 - Q.38 What did you think were the strongest aspects of the course?

Categories	Themes	%
Teaching presence (Total 75%)	Course design	13%
	Course management	12%
	Facilitator support	38%
	Technologies/support	12%
Cognitive presence (Total 25%)	Authentic tasks	25%

The facilitator's support (38%) was highly valued as can be seen from the following comments: "excellent support provided by the course facilitator" (Respondent 1-1), the, "facilitator was very supportive and available which was brilliant" (Respondent 3-1) and

The consistent and always convenient access to the Instructor. I suspect we were very lucky to have such ready, frequent and enthusiastic support (Respondent 4-1).

The authentic task (25%) and the timing of the course (12%) were other aspects of the course some participants found beneficial as these aspects enabled them to create meaningful

workplace products that they could implement in their workplace. For example one participant commented:

I was able to redevelop my unit plan and activities in my online unit as part of the course...ready for semester one. Timing of course in January meant this was able to be completed ready for semester one (Respondent 3-1).

Areas they thought could be improved (Q39) are identified in Table 9. In particular, some participants experienced issues using new technologies (50%) and completing the course tasks within the recommended schedule (25%).

Table 9: Iteration 1 - Q.39 What areas do you think could be improved?

Categories	Themes	%
Teaching presence (Total 87%)	Course design	12%
	Course management	25%
	Technologies/support	50%
Cognitive presence (Total 13%)	Authentic tasks	13%

Several participants had trouble using new technologies and understanding the affordances they offered for online learning. For example, one participant did not feel entirely comfortable using Skype, “the Skype chat was good but sometimes I felt like I was coming in on the end of a conversation” (Respondent 1-1) and some had trouble comprehending the purpose of some of the course technologies. One person said, “I found blogging difficult as I struggled a bit with the purpose” (Respondent 1-1) and another offered the following constructive suggestion:

Despite my complaint about using a blog, Diigo, Google Docs and Skype above, I do see how important it is to be exposed to such technologies. I wonder if these could have been introduced with a brief, specific activity that both familiarize us with the technology and demonstrated its usefulness to our learning (Respondent 4-1).

A couple of participants also commented that completing the tasks within the recommended time allocation was an issue (25%), “3 hours a week was nowhere near enough time to allocate” (Respondent 2-1). This suggested the recommended time may need to be increased or the amount of content reduced.

The facilitator, who is also the researcher, also identified the issues raised by participants as areas that required improvement. The facilitator’s reflections are discussed in the following section.

Facilitator's reflections

Facilitator's reflections were documented using a reflective e-journal. The facilitator reflections concurred with many of the observations and issues noted by participants, most specifically, the recommended time allocation, accessing the group social media sites and the blogging task.

It was noted in the facilitator e-journal that most learners appeared to struggle to complete the activities within the allocated time frame. Further, four weeks seemed insufficient to experience the benefits of blogging as the time required to setup and learn about blogging left little time for participants to actually reflect on the readings and their learning.

Access to some of the social media sites also appeared to be problematic. A few participants experienced problems joining the Skype and Diigo groups as these sites required users to download and install software on their computers, which for institution-owned computers often required permission from IT services.

On the prospective teaching survey some participants who responded *yes* to the question: "Did you resolve any issues you identified in the background survey for designing and delivering online learning?" were unable to explain *how* they resolved their issue(s) because they could not remember what they wrote on the initial survey and the technology used (Google Forms) did not allow them to keep a copy of their completed survey responses.

The facilitator also noted that time could be saved in creating the open companion website by linking to an existing open website *The Technology Toolbox for Educators* that already contained information about various technologies and examples of how they could be used to support student learning. As with other data sources, reflection on aspects of the course design, that were noted in the facilitator's journal, led to a number of changes to the learning environment as described in more detail in the following section.

Recommended improvements

Feedbacks from participants, together with the facilitator's reflections, were mapped against the components of the authentic online learning framework to identify improvements for future iterations of the course. Issues and recommendations for improving the 2nd iteration of the course are described below in Table 10.

Table 10: Iteration 1 - Issues and recommendations for improvements

Elements	Issues	Recommendations
Teaching presence	Participants struggled to complete tasks by due dates	<p>Increase the time commitment to 4 hours per week</p> <p>Simplify tasks (i.e., replace the blog with a discussion forum).</p> <p>Reduce content (i.e., remove video component from the final course task).</p> <p>Position task progress checklist more prominently on the LMS and advise participants at the beginning of the course to download a copy to track their progress through the course.</p> <p>Suggest participants create their own calendar schedule to plan their time for the course to help them complete the tasks within the 4 weeks.</p>
	Technology: Creating blogs took too long and the purpose of using a blog was not clear	<p>Replace the blog with a discussion forum</p> <p>Provide clear instructions advising participants to post weekly reflections about their learning journey. (i.e., What they liked and what they are struggling with).</p>
	Technology: Problem downloading & installing software	<p>Skype & Diigo – Send an email to advise participants to install software prior to course commencement and to contact their IT service if they are using an institution-owned computer.</p> <p>Send an invitation to all participants to join the Diigo group the week the course opens (1 week before the course commences).</p>
	Technology: Google Form: Some participants could not remember what they wrote on the background survey	<p>Use the assignment submission feature on the LMS, instead of a Google Form so that participants can refer back to their responses when they complete the question about issues on prospective teaching survey at the end of the course.</p>
Social presence	Technology: Some participants failed to grasp why Skype was used to encourage communication	<p>Skype – include reading: Perceptions & reflections using Skype (cf. Parker, et al).</p> <p>Add a forum discussion in orientation week about social presence and how different technologies encourage different types of communication.</p>
	Limited interaction required	<p>Include written peer review for Task 1 course analysis to encourage interaction between participants.</p>
Cognitive presence	Technology: Some participants failed to grasp how Diigo could be used as a cognitive tool to support learning	<p>Diigo – Add readings to Diigo group library and encourage participants to share their understanding of the readings by adding comments.</p> <p>Ask participants to add at least one item to the Diigo group library that offers a different perspective about the concepts covered.</p>

The recommendations for improvements identified above were made to the course design and implementation procedures prior to the commencement of the 2nd iteration of the course. These changes are described in the next section.

Iteration 2 of the course

The 2nd iteration of the course was implemented in the June mid-semester university break and, like the 1st iteration, ran for five consecutive weeks. A confirmation of registration email was sent to all participants that included a copy of the course information learning guide, instructions about how to access and login to the Moodle LMS, instructions for downloading and installing Skype and Diigo software and advice to contact their IT department (if necessary to help them install the software *before* the course commenced). The email also advised they would need to dedicate approximately four hours a week (16 hours in total) to complete the course.

A welcome email was sent to all participants one week prior to the course advising that the LMS was now open and encouraged them to view the navigation video and complete the orientation activities before the course commenced.

Figure 18 below illustrates the revised course structure for the 2nd iteration of the course.

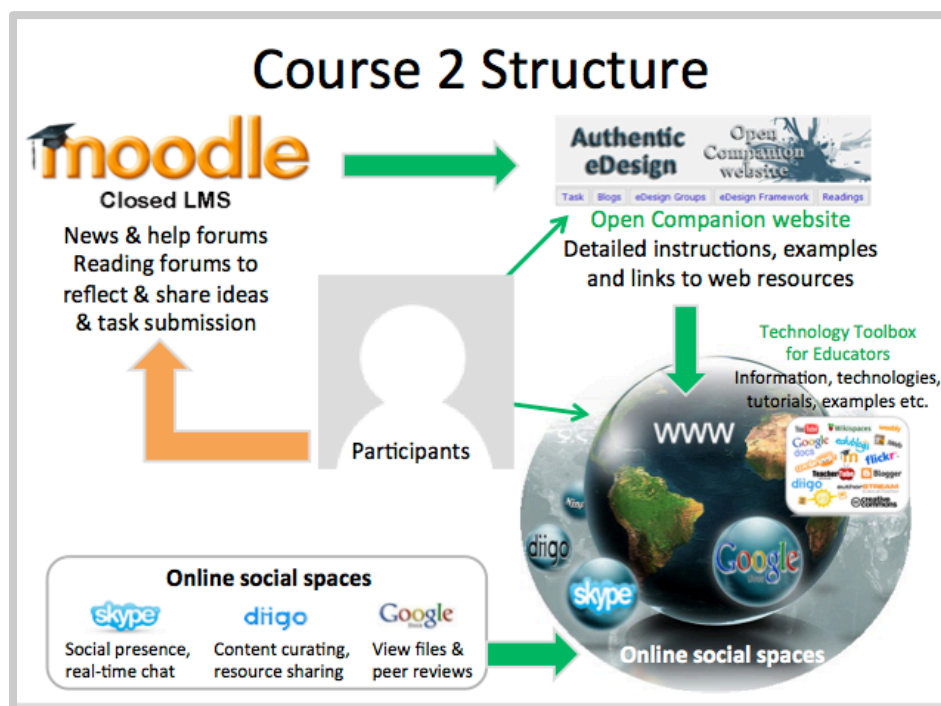


Figure 18: Iteration 2 - Course structure

Like the 1st iteration, participants first logged into the Moodle LMS. They could then access the open companion website that included detailed instructions about how to complete the course tasks, examples of completed tasks and links to web resources. However, to avoid having to recreate information and links about suggested technologies, pedagogies and tutorials each time the course was implemented, participants were re-directed to an existing website: *Technology Toolbox for Educators* that already contained these resources and supports.

Weekly reflection forums were added to the Moodle LMS to replace the blog activity and specific activities were included on the open companion website or on the LMS to help participants learn how Diigo and Skype could be used to support student learning.

- *Diigo activity* – All readings were added to the Diigo library and links were provided on the Lectures & Reading page on the companion website to redirect participants to the Diigo library. Participants were asked to share their understanding of the theoretical concepts covered in the readings by adding comments to the relevant resource in the Diigo group library. Short 10 minute weekly lectures about the concepts covered in the readings were also added to the Lectures & Readings page on the companion website.
- *Skype activity* – Social presence information was added to the Groups page on the companion website, and a reading about using Skype to build social presence was added to the reading list. A question was also added to the Week 1 reflection forum on the Moodle LMS forum asking students to share their experience of how they had used Skype in their courses or to reflect on how Skype could be used in their future courses.

These and other recommendations identified in Table 16 were implemented prior to the 2nd iteration of the course. As for Iteration 1, participant feedback, facilitator reflections and data gathered from the discussion forums, Skype and Diigo were analysed to identify areas for improving the course design for future iterations.

Ten people commenced the course (8 female & 2 male) and four participants (all female) finished the course. Two of these participants were lecturers from New South Wales and the other two were teaching and learning advisors (one from Western Australia and one from overseas). Four participants completed the prospective teaching survey and three participants completed the anonymous online course evaluation survey. The following section discusses feedback received from participants about the course design and implementation.

Participant feedback

In response to Q.38, where participants were asked to indicate what they liked about the course (Table 11), participants indicated some of the strongest aspects of the course were: the support provided by the facilitator (50%), the range of open access resources (25%) and the exposure to new technologies (25%).

Table 11: Iteration 2 - Q.38 What did you think were the strongest aspects of the course?

Categories	Themes	%
Teaching presence (Total 100%)	Facilitator support	50%
	Resources/support	25%
	Technologies/support	25%

Like the 1st iteration, participants highly valued the elements of teaching presence (100%) incorporated in the course. In particular, they appreciated the support provided by the facilitator. One commented, “the generosity and knowledge of the lecturer in responding to all questions very quickly” (Respondent 2-2) and another said, “the facilitators skills, knowledge and timely response to all questions” (Respondent 3-2). These comments highlight how important it is for the teacher to be actively involved in the online environment.

They also commented that the, “access to new technologies and detailed assistance in understanding on how to use them” (Respondent 2-2) assisted their learning and that the course resources were very useful:

The video content and readings were good and relevant and they provided a good start for each week to outline what was required (Respondent 1-2).

Areas they thought could be improved in response to Q.39 (Table 12) were: navigation between the closed LMS site and the open web (40%), the course technologies (20%) and the low level of collaboration amongst participants (40%).

Table 12: Iteration 2 - Q.39 What areas do you think could be improved?

Categories	Themes	%
Teaching presence (Total 60%)	Course design	40%
	Technologies/support	20%
Social presence (Total 40%)	Collaboration	40%

It was anticipated that participants unaccustomed to working between open and closed Internet platforms might initially feel confused. Therefore, a *How to navigate around the*

course video was provided in the *Getting started* section on the LMS. However, it appeared a couple of the participants struggled with the flexible pathways incorporated in the course design. One participant admitted to confusion about when they were in the LMS and when they were on the open web:

I felt lost sometimes as to whether I was in the course site, or taken out to other sites. I'm not sure how you could improve - perhaps more of an indication of which bits would open outside the course and some navigation to help get back to the course might be good (Respondent 1-2).

The above comment indicates this participant did not view the navigation video, or they may have lacked the necessary skills to navigate the abundance of resources available on the open web (McLoughlin & Lee, 2008, p. 5). In the not too distant future, it is expected that LMS platforms will be able to seamlessly integrate with open web technologies (Pugliese, 2012), thus alleviating the need for multiple sign-ins which should make moving between closed and open spaces much easier for learners. The same respondent also advised they experienced technology issues and didn't know why:

I had a lot of trouble with Google Drive, even though I'm familiar with it and use it regularly – not sure why I had so many issues (Respondent 1-2).

It is possible that they were familiar with the Google Drive features that they personally used but not with the sharing and collaboration affordances that support student learning.

A couple of participants suggested that the low number of active participants hindered collaboration among participants. One stated:

The activities were well designed to encourage sharing, collaboration, discussion but the numbers in the course didn't result in it happening very well (Respondent 2-2).

Another wrote:

There were too few participants and so the collaborative aspects were not what I believe they could have been (Respondent 3-2).

The facilitator also felt that participant interaction was very low in this iteration and her reflections about this issue and recommendations for improvement are discussed in the following sections.

Facilitator's reflections

Again, a reflective e-journal was used to record the facilitator's reflections during the course about design and implementation aspects that worked well, and areas that could be improved in future iterations. Areas that the facilitator identified that could be improved were: participant interaction, the installation of the Skype and Diigo software and time allocation.

The facilitator was not sure if the limited participant interaction was because of the low number of active participants, as suggested above by a couple of participants. Or because the pedagogical tools employed in the 2nd iteration for students to reflect on and share their ideas about the readings were teacher-created spaces (e.g., LMS forums, Diigo group) rather than student-created spaces (blogs) as with the 1st iteration. The facilitator also noted that some participants still struggled with the installation of the course applications (e.g., Skype and Diigo), which primarily appeared to be due to institutional restrictions.

No-one in the 2nd iteration flagged the recommended time allocation as an issue, although the facilitator identified that participants still found it difficult to complete the tasks by the suggested due dates.

Recommended improvements

As with the 1st iteration, feedback gathered from participants together with facilitator reflections were aligned with the components of the authentic online community of learning framework to identify recommendations for improving the next iteration of the course. These are described in Table 13.

Table 13: Iteration 2 - Issues and recommendations for improvements

Elements	Issues	Recommendations
Learning environment	Some learners had difficulty navigating between the open and closed spaces	Delete the companion website. Most content, supports and resources are included in the Technology Toolbox for Educators and task instructions do not need to be revisited after the course, so they can be moved to the LMS. Reinforce the importance of viewing the navigation video to assist students to identify when they are in an open website or within the closed LMS environment.

Elements	Issues	Recommendations
Social and cognitive presence	Low interaction amongst learners despite opportunities to collaborate and share ideas	Promote the next course more widely to try and increase participant numbers. Contact the University Teaching and Learning unit to see if they would include the course on the staff training calendar. Contact Postgraduate office and request them to circulate the course details to all local universities through their official channels. Include more targeted discussion of relevant concepts in the readings.
Teaching presence	Participants struggled to complete tasks by due dates	Keep time-commitment the same 4 hours per week. Include an optional F2F orientation session to assist participants with downloading software and encourage them to complete the orientation activities before the course commences. Stress the need to complete the orientation activities before the course commences.
Technologies	Encourage more learner-learner interaction?	Re-introduce the blog for reflection and articulation to see if this student-created technology encourages greater interaction and collaboration among participants.
	Installation of technologies (Skype, Diigo)	Advise participants to install required software before commencing the course so they can seek assistance from their IT staff if they encounter problems. Offer the opportunity for participants to attend a Face-to-face orientation session (the same as the online orientation) to help them feel more comfortable working between applications.

As with Iteration 2, improvements were made to the course design and implementation procedures ready for the 3rd iteration of the course.

Iteration 3 of the course

The 3rd iteration of the course, like the 1st iteration, was implemented in the university summer break in January. Participants were sent a registration confirmation email that included a copy of the course information learning guide, instructions on how to access and login to the Moodle LMS and an invitation to attend the face-to-face orientation session. They were also advised that they would need to dedicate approximately four hours a week (16 hours in total) to complete the course.

Unlike the first two iterations, the University Teaching and Learning unit supported this iteration by adding the course to the Staff Training Calendar and circulating details about the course to all Western Australian Universities via official inter-university networks. They also

provided facilities and computer equipment for the face-to-face orientation session and IT services provided technical support for participants who experienced technical issues such as logging onto the Eduroam university network.

Recommendations for improving the course, identified in the previous section, were implemented prior to the commencement of the 3rd iteration. Figure 19 below illustrates the revised course structure for the 3rd iteration of the course.

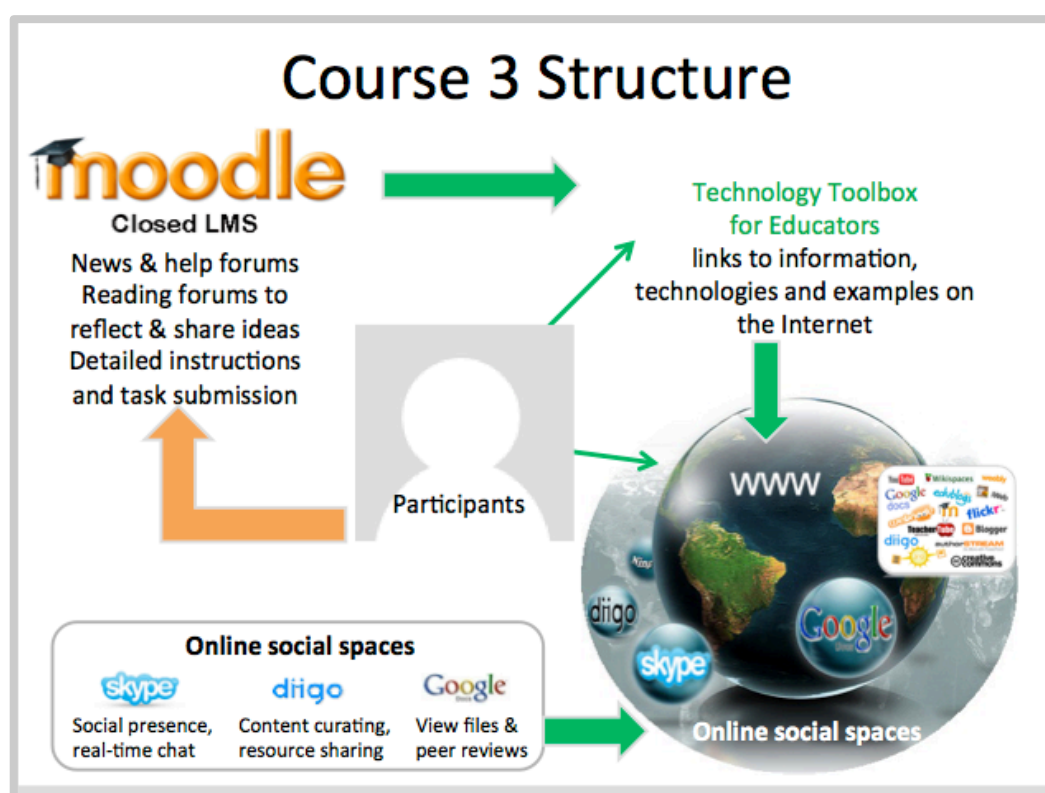


Figure 19: Iteration 3 - Course structure

In this iteration, the companion website was deleted and the detailed task instructions were added to the Moodle LMS to streamline the course navigation. All support materials and resources were accessed via the *Technology Toolbox for Educator* wiki. The blog was re-introduced as the medium for participants to reflect on their learning and the readings, and participants were asked to create their blog as part of the orientation activities prior to the commencement of the course.

Two targeted activities were included to encourage interaction and collaborative construction of knowledge amongst participants. The activities provided participants with a protocol (Zydney et al., 2012) for sharing their thoughts about the readings on their blog and

commenting on others' posts. An optional three-hour face-to-face orientation workshop was incorporated and conducted the week before the course commenced to encourage participants to complete the orientation activities before the course commencement date, thus giving them more time to complete the essential tasks during the four-week course period. Participants who were unable to attend the face-to-face orientation were able to complete all orientation activities online, as in previous iterations.

With university endorsement and marketing assistance, 56 people registered in the course and 41 people (29 female & 12 male) actually commenced. Five participants (all female) from three universities within Western Australia finished the course. Nine participants (7 female & 2 male) completed the prospective teaching survey and seven participants responded to the anonymous online course evaluation survey. The following section discusses participant feedback about the course design and implementation.

Participant feedback

In the 3rd iteration of the course, in response to course evaluation question 38 (Table 14), teaching presence was again identified as the strongest aspect of the course. In particular, participants commented on the course design (28%), the facilitator support (22%), and the range of quality resources (17%).

Table 14: Iteration 3 - Q.38 What did you think were the strongest aspects of the course?

Categories	Themes	3 rd
Teaching presence (Total 78%)	Course design	28%
	Facilitator support	22%
	Resources/support	17%
	Technologies/support	11%
Cognitive presence (Total 11%)	Authentic tasks	5.5%
	Authentic Assessment	5.5%
Social presence (Total 11%)	Collaboration	11%

A number of participants commented on the flexible and open nature of the course design (28%). For example one person responded, "For me, the course was authentic learning in-action" (Respondent 1-3). Another said, "It catered for all levels of expertise with online learning platforms" (Respondent 6-3).

Others indicated that they valued the facilitator's presence (22%). One person wrote, "The facilitator was very supportive and available which was brilliant" (Respondent.1-3) and another stated:

The facilitator was quick to respond, and appeared to be regularly monitoring all activity. This gave the feeling that she was ‘close by’ and ‘to hand for questions’ which was very reassuring (Respondent 3-3).

Participants also advised that the selection of resources were useful (17%). One person responded, “The readings provided a sound introduction for authentic learning and the use of technology” (Respondents 1-3) and another commented, “The strategic choice of literature and other course materials e.g., videos” (Respondent 2-3).

Areas participants’ thought could be improved, shown in Table 15, were: course design (25%), course management (37%), technology resources (25%), and participant collaboration (13%).

Table 15: Iteration 3 - Q.39 What areas do you think could be improved?

Categories	Themes	%
Teaching presence (Total 87%)	Course design	25%
	Course management	37%
	Technologies/support	25%
Social presence (Total 13%)	Collaboration	13%

Whilst most participants seemed to have no problem navigating between the open and closed components of the learning environment (75% did not cite the course design as an issue), it appeared a few participants found the course environment difficult to navigate (25%). One participant commented:

I did not really like the Moodle platform, I actually found it difficult to navigate through the course, you can get lost in all the links (Respondent 2-3).

Despite encouraging participants to download and install the required software before the course commenced and offering them the opportunity to compete these tasks in a face-to-face workshop the recommended time allocation still appeared to be an issue. For example the following response indicated the recommended time allocation was misleading:

On the first day alone I spent six hours setting up, writing and reading. If the course was run again, I would suggest saying that it would take a minimum of at least 6 hours a week, more depending on the level of engagement and technical knowledge (Respondent 1-3).

Due to the wide variety of participants’ existing knowledge, skills and experience it was difficult to estimate the time required for each individual participant to schedule their time. Perhaps the facilitator needed to make it more explicit that the recommended four hours was

an “average” indication and that some people might complete the activities more quickly, while some might need to allocate more time depending on their existing technology abilities or their desire to engage with some of the concepts in more depth.

Learning how to use new technologies was also an issue for some participants (25%). One participant indicated a step-by-step user guide would be useful:

A step-by-step user manual for Google Docs would be good. This course was at a busy time for me and I didn’t want to waste my allocated time having to find out how to do things (Respondent 5-3).

This comment appears to stem from the participant’s existing concept of a traditional online delivery approach, which is no longer appropriate in the current information age, as finding and curating relevant information and resources are critical skills for 21st century learners (Partnership for 21st Century Skills, n.d.).

Another commented that access to “how to section” would have been of assistance:

During the course, I often asked the question “how do you do what you do? For example, how do you make a YouTube video? How do you make a video where you can move your mouse around the screen to show things? I found the beginning of answers to some of my questions on Diigo and through my own Internet searches, but I was wondering whether under your Quick links, you could have a practical “how to do” section (Respondent 1-3).

The above comments are interesting because the LMS did include a quick links area with links to both a *Getting started with Google Docs* resource, and “how to tutorials” on the *Technology Toolbox for Educators* website for all of the tools mentioned above. It appears some participants lacked the time or self-directed learning skills to explore the resources and supports provided in the course (McLoughlin & Lee, 2008).

Another person indicated they would have liked a, “stronger group atmosphere or collaborative edge” (Respondent 7-3). Again, it would have been interesting to obtain more detail from this respondent to illuminate what they meant by the term “collaborative edge”.

Facilitator’s reflections

Areas the facilitator thought could be improved were: time-allocation and social interaction. Like iteration 1 and 2, it appeared completing tasks within the recommended timeframe was still an issue for many participants. However, it was more evident in this iteration of the course. This may have been because many participants were still away on annual leave when the course opened. Therefore, quite a few people started the course late or, despite their best

intentions, did not start at all. Starting late and having to catch up on work made it difficult for some participants to progress through the course according to the suggested schedule. The facilitator felt this had a negative impact on the collaborative reading and discussion activities as some participants did not receive comments on their blog until well after the activity was scheduled to be completed or not at all. Following up with learners to see if they were continuing in the course and needed assistance also took up quite a lot of the facilitator's time.

The reading activities generated considerable cognitive interaction as was evident from the participant posts and comments on each other's blogs (see Chapter 7). However, aside from the introduction forum, there was very little social interaction between participants. Research indicates social interaction should be encouraged in an online learning environment as it can be a motivating factor that may contribute to learner retention (Nelson, 2014). It was not possible to identify why participants did not interact socially; however, comments made by participants in the surveys and emails to the facilitator suggest heavier than expected workloads may have contributed to the lack of social interaction. Social presence is discussed in greater detail in Chapter 5.

Reflecting on the participant feedback, the facilitator noted a few people who indicated that insufficient time to complete the tasks was still an issue. Perhaps it would be better to *overestimate* the suggested time required (i.e., estimate on the lowest technical ability, rather than the average), so that participants allow more time than might actually be required

Subsequently, participant and facilitator feedback was used to identify how the course design and implementation could be further refined to improve future iterations of the course.

Recommended improvements

As with the 1st and 2nd iterations of the course feedback was mapped against the components of the authentic online community of learning framework to identify areas for improving subsequent iterations of the course. Recommendations for improving future iterations of the course are described in Table 16.

Table 16: Iteration 3 - Issues and recommendations for improvements

Elements	Issues	Recommendations
Teaching presence	Four hours a week time allocation was not sufficient for some participants	Suggest 6 hours for the orientation and then 4 hours per week. Advise time will depend on participants existing knowledge and the “depth” of learning and exploration they want to undertake.
	Technologies: Step by step user guides for course technologies	Include links to “how to” tutorials for the course technologies in the “quick links” block so learners can access them easily at any stage during the course.
Social presence	Timely interaction & collaboration	Investigate ways to motivate participants to complete the collaborative activities on time to ensure all participants receive feedback from their peers.

These recommendations for improvements could be useful for future implementations of the course. Participant perceptions about the course design for all three iterations are summarised in the following section.

Summary of all three iterations

Table 17 shows the percentage of responses to the themes identified for Q.38 for each iteration and the total of all three iterations.

Table 17: Summary - Q.38 What did you think were the strongest aspects of the course?

Categories	Themes	1 st	2 nd	3 rd	Total
Teaching presence (Total 79.5%)	Course design	13%	0%	28%	21%
	Course management	12%	0%	0%	3.5%
	Facilitator support	38%	50%	22%	27%
	Resources/support	0%	25%	17%	14%
	Technologies/support	12%	25%	11%	14%
Cognitive presence (Total 13.5%)	Authentic tasks	25%	0%	5.5%	10%
	Authentic Assessment	0%	0%	5.5%	3.5%
Social presence (Total 7%)	Collaboration	0%	0%	11%	7%

The most consistent response for all three iterations of the course to the question “*What did you think were the strongest aspects of the course?*” (Q.38) was facilitator support (27%). Many examples about the, “excellent support provided by the course facilitator” (Respondent 1-1) were included in the previous sections. The second highest scoring element was the course design (21%). Participants across all iterations indicated the flexibility of the course design and the authentic student-centered approach contributed to their learning.

The findings suggest that effective teaching presence plays a key role in supporting learners in an authentic online learning environment (Aragon, 2003; Arbaugh & Hwang, 2005; Garrison, Cleveland-Innes, et al., 2010).

As shown in Table 18, two areas in particular that participants thought needed improvement (Q.39) were the course design (25%), course management (20%) and technologies (30%).

Table 18: Summary - Q.39 What areas do you think could be improved?

Categories	Themes	1 st	2 nd	3 rd	Total
Teaching presence (Total 81%)	Course design	12%	40%	50%	33.5%
	Course management	25%	0%	12.5%	14%
	Technologies/support	50%	20%	25%	33.5%
Cognitive presence (Total 5%)	Authentic tasks	13%	0%	0%	5%
Social presence (Total 14%)	Collaboration	0%	40%	12.5%	14%

Navigating between the LMS and multiple open social media sites appeared to be an obstacle for participants across all iterations of the course (33.5%). This was not surprising as it is common for students to feel lost and confused in a learning environment with multiple pathways for accessing content, and many learners are unfamiliar with this authentic approach (Anderson & Dron, 2011).

Many participants appreciated the opportunity to experience new technologies (Q38 – 47%); however, some learners identified technologies as an area that could be improved (33.5%). Suggestions for improvement indicated these participants would like more detailed instructions about how to use the technologies and clearer signposts about where to find this type of information (as there are many good tutorials readily accessible on the Internet).

The above responses suggest further refinements could be implemented to improve the course. However, in response to the survey statement #35, *Overall I thought the course was a useful professional development opportunity*, all participants across all iterations agreed with this statement (60% strongly agreed & 40% agreed).

This chapter described the participants' and facilitator's perceptions about the effectiveness of the course design and how modifications were implemented for improving subsequent iterations of the course. Chapters 6 - 9 describe how data was collected and analysed, and reports the findings of the research in response to the secondary research questions:

-
- In what ways do the components of social, cognitive and teaching presence facilitate the design and implementation of authentic online courses within higher education?
 - How effective is an authentic online learning framework in encouraging practitioners to implement new pedagogies and technologies within their own online courses?

The following chapter discusses the data findings concerned with social presence and how the components of social presence facilitated participant learning.

Social presence analysis and findings

In Phase 3 of the study, data was collected and analysed to answer the secondary research question: *In what ways do the components of social, cognitive and teaching presence facilitate the design and implementation of authentic online courses within higher education?*

A detailed analysis of the data related to *social presence* is presented and discussed in this chapter. An analysis of *cognitive presence* is discussed in Chapter 7 and *teaching presence* in Chapter 8.

Method of analysis

Coding and analysis of data— specifically the course evaluation survey, the background survey, the prospective teaching survey, data collected from blogs, forum discussions, Diigo comments, Skype chats and other documentary evidence collected as part of the normal running of the course —was completed using Glaser and Strauss’ (1967) constant comparative method of qualitative analysis. This joint coding and analysis method enabled the data to be systematically categorised and analysed using consistent measures so that participants’ responses could be grouped into relevant themes to facilitate comparison and analysis.

Coding of data

Iterative rounds of data reduction began with analysing and coding the data based on a priori themes from the draft framework, in particular the elements of authentic learning and tasks, using technology as cognitive tools and open educational resources. Finally, patterns in the codes were combined into relevant categories, based on social, cognitive and teaching presence components of the Community of Inquiry model (Grant, 2011).

Use of pseudonyms and presentation of quotations

Data for each participant was coded separately using a pseudonym. For example, as in (AB-2, Skype), where *AB* is the pseudonym, 2 is the 2nd iteration of the course and *Skype* is the data source. Where participant responses were collected in written form (such as in discussion forums, blogs, Skype chat, email etc.), quotations have been presented as written, including

words in the participants' own idiom and sometimes grammatically incorrect prose. In these quotations the intrusive use of the [sic] notation has been avoided.

Data related to social presence were categorised using the three components of social presence: affective, interactive and cohesive responses described in the draft authentic online learning framework. These are discussed in the following section.

Social presence in authentic online communities

In the context of the *authentic online learning framework* used to design the course, social presence is defined as, “the ability of participants in a Community of Inquiry to project themselves socially and emotionally, as ‘real’ people (i.e., their full personality), through the medium of communication used” (Garrison et al., 2000, p. 94).

Three social presence themes were anticipated based on *a priori* components derived from the draft *authentic online learning framework*: emotional communication, open communication and group cohesion. Data was analysed using Rourke et al.'s (1999) coding template for assessment of social presence. Indicators, definitions and examples for each of the three themes are provided in Appendix 27. The analysis revealed how the components of social presence facilitated the design and implementation of the authentic online professional development course and the themes and issues related to social presence that emerged from the analysis are discussed below.

Affective responses

Affective responses include: expression of emotions, use of humour and self-disclosure. Creating a safe and trusting environment where participants feel comfortable expressing themselves can help to build an online community of learning (Reeves, 2006b). Sharing personal characteristics assists the development of inter-personal relationships that can support cognitive presence by indirectly contributing to the process of critical thinking, or support affective goals to maintain student motivation and engagement.

Analysis of participant communications revealed quite a few examples of affective expression occurring across all iterations of the course. The introduction forum, personal blogs and Skype chat appeared to be the primary social spaces where participants interacted, reflected and articulated their feelings, thoughts and ideas.

Introduction forum

The *introduction forum* at the beginning of the course was intended to set the climate for the learning environment. Participants were encouraged to add a photograph to their Moodle profile and then introduce themselves to their peers and the facilitator on the Introduction forum. The facilitator introduced herself and encouraged all participants to not only share information about their work experience, but also to express why they wanted to do the course and disclose some personal interests about themselves (if desired) to start to build their online social presence and group cohesion.

The *getting started* section of the course included information about social presence and netiquette guidelines before the introduction activity to help participants understand the importance of online communication for supporting effective online learning. Most participants, across all iterations of the course, added their photo to their profile and introduced themselves on the forum. Many participants disclosed personal information, such as interests and hobbies, and used humour in their posts as can be seen in the extract below:

With my partner I have just moved into our new house (our first) in Hammy Hill, joining the league of mortgage and ratepayers was a big step :-) (JM-3, Forum).

Quite a few people also responded to others' posts and started forging social connections with their peers. One person wrote about where she lived, her teaching background and her favourite pastimes:

Hi, I'm [JF-2], and like [HD-2], I'm from Sydney. I teach English for Business in a language college, and have been trying to think of ways to engage the students more deeply...I love the water - swimming, bodysurfing and kayaking, and on dry land find time for Scottish Country dancing whenever I can (JF-2, Forum).

Her disclosure prompted another to respond:

Hi [JF-2], Where do you swim, bodysurf and kayak in Sydney? I used to live in Balmain - so only really glimpsed the water from the Ferry to UTS :-/. Cheers for now (MO-2, Forum).

The conversation continued with the following reply:

Hi [MO-2], I live in the south of Sydney, so I kayak on the Woronora River near Sutherland and surf at Elouera near Cronulla. The ferry trip to and from Balmain is a nice way to start and finish the day (JF-2, Forum).

It was not unusual to see so many people posting to the forum and connecting with others. Introductions are a common ‘ice-breaker’ strategy used in both face-to-face classrooms and online environments for helping build rapport among learners.

Blog communications

A blogging activity was included in the 1st and 3rd iterations of the course to support both cognitive and social presence. Participants were asked to create a personal blog to reflect on and share their thoughts and ideas about the course content (collaborative construction of knowledge) along with their feelings about their online learning experience (affective expression). Collaborative construction of knowledge contributes to the development of cognitive skills, an idea that is discussed further in Chapter 7. The following comment illustrates how one participant in the 1st iteration shared their feelings about being exposed to blogging in public for the first time:

This is my first blog. Feeling a little nervous, I am nevertheless beginning and hoping all will be good and if not, hoping I can fix it! (CM-1, Blog).

According to Lowe and Williams (2004) it is not unusual for learners to feel anxious when they are exposed to blogging in public for the first time. However, they also indicated that once students started blogging they overcame their initial anxieties and enjoyed writing for an authentic audience. It was evident that peer support played an important role in reassuring and encouraging some participants in this course to continue blogging. After the above participant wrote about feeling nervous, a number of her peers replied with encouraging comments and support. One person shared her own feelings and commented that the course provided a safe and supportive environment for new bloggers:

Are you feeling nervous about blog posting? If so, I was as well!! I felt so overwhelmed when I was trying to think of what sort of useful and insightful information that I could contribute to the world. After writing my first (ever) blog post, I felt so much better... [MP-1, Blog].

Another commented that she too, at first, didn’t want to reveal too much in her blog but once she got started, she found the process less daunting:

I started out feeling really paranoid about everything I said, and how I said it, in case I should invite opposition or reveal too much of myself, or something. And yet curiously, I find the process leads me to often share more than I ever thought I would! That in itself is quite liberating [LD-1, Blog].

Most participants were first-time bloggers and were eager to share their own feelings and experiences to support and encourage their peers. One person commented on how exciting it was doing things outside of her comfort zone:

I am also a novice blogger and was paranoid that whatever I wrote would be 'out there' making me look like an idiot! However, now that I've broken the ice I feel less nervous. I feel like the course is already getting me doing things outside my comfort zone which is really exciting! (HS-1, Blog).

The participant who created the original post, indicated in her final post that the emotional support expressed by her peers encouraged her to keep blogging:

Thanks so much for sharing your first experiences and offering such helpful support and encouragement! This is much appreciated! I will blog again soon! (CM-1, Blog).

The blog examples above also demonstrate interactive expression (see next section) as the respondents continued to contribute to this thread using the blog comment feature and referred explicitly to comments within the posts.

Weekly reflection forum communication

In the 2nd iteration, the blogging activity was replaced with a Diigo (social bookmarking activity) to support cognitive presence (discussed in Chapter 7) and a weekly reflection forum where participants could share their thoughts and ideas about the course content (cognitive expression) and their feelings about their online learning experience (affective expression).

Most participants posted their reflections in the Week 1 reflection forum and included affective expression. Self-disclosure comments about their online teaching experience were common:

I have very little experience with online learning, other than designing and running my one course for the past two years. I fairly much thought about what I felt were important in face-to-face courses and tried to work out how to incorporate them in an online environment. With my limited technology skills this was quite basic (HD-2, Forum).

Another expressed their feelings about meeting others and how getting to know others assisted them to feel a greater commitment to learning:

I've enjoyed meeting new, positive people, and being inspired by them, and by new possibilities - with technology and trying new things with my learners. Introducing ourselves and getting to know each other a bit has helped to feel a greater commitment to learning. I'm somewhat daunted by what is ahead, as I definitely have a lot to learn (JF-2, Forum).

A third person specifically addressed the group and expressed how she was looking forward to the social interaction afforded by the course:

Hi [facilitator name] and other colleagues. Thanks for providing this area for us to share our thoughts and reflections this week. ...I'm looking forward to sharing further here and in other discussions on this and to hearing your thoughts about learning for Week 1 – thanks 😊 (MO-2, Forum).

One person reflected on the icebreaker activity and the importance of including images to help students build rapport. She also suggested that audio might assist with the development of group cohesion:

I think photos can help with the story - so I think I would like to try getting students in my course to post a photo in their initial icebreaker exercise and include a description of the photo, explaining why its special to them. To take it further a short podcast explaining the photo might also help put a "voice to a name", and help the class feel more connected (RS-2, Forum).

Very few participants posted their reflections on the Week 2 forum and no posts were entered on the forums for the following weeks. However, the data does not illuminate why participants did not continue to post their reflections on the forums.

Skype chat communications

The primary purpose of the Skype chat was to simulate real-time face-to-face conversation to encourage social communication between course members. In the 1st iteration of the course participants primarily used their blog to express their emotions as seen in the quotes above. However, affective communication was also evident in the Skype group chat. One person commented, “I must say, this is amazing to all be on the chat together” (CM-1, Skype).

Another said she felt guilty about not having finished her task by the due date and felt awful asking the facilitator to provide her with feedback after the course had finished. Despite the fact that the facilitator responded that she understood and was happy to look at her final course outline and provide feedback, it was obvious the participant felt uncomfortable, as she responded:

I know, but remember I am the girl that gets hung up on the “rules” and fulfilling expectations ☺ (LD-1, Skype)

To which the facilitator responded, “Yes, I remember ☺. All I can do to help is to reassure you that it is OK ☺”. Interactions at a personal level such as these are supported by the use of emoticons to assist the expression of feelings and facilitate online communication.

In the 2nd iteration, the Skype group chat was the primary social communication space and again affective communication was evident. One person said:

Yes, I went swimming with sealions up at Jurian Bay earlier this year. It was SO much fun, they were so playful and cheeky (RS-2, Skype).

Another shared information about her research:

I am working on a paper with [name removed] for the [name removed] conference. I also need to think about submitting my PhD proposal sometime this year – eek! I'm meeting with a potential supervisor on Wednesday, so fingers crossed! (NG-2, Skype).

Findings for the 3rd iteration also indicated that participants primarily used the Skype text chat to convey their feelings and seek help from the facilitator as seen in the following quote:

Sorry [facilitator name] I am confused. I have completed my task 1 but I cannot work out how to add my task analysis to the peer reviews spreadsheet? Please help!! (SA-3, Skype).

Perhaps the closed environment of the Skype group made participants feel more comfortable with expressing their emotions and the immediacy of real-time synchronous chat was more beneficial for obtaining timely feedback from the facilitator.

Interactive responses

Interactive responses include continuing a thread or contributing to others' discussions, quoting from others messages, referring explicitly to other's messages, asking questions, complimenting, expressing appreciation or expressing agreement. A range of technologies was included to facilitate different forms of interactive communication. Asynchronous tools included blogs (group - public Internet), discussion forums (group - participants only) and email (individual). Synchronous communication was facilitated using Skype chats (group - participants only).

A statement relating to interaction between learners and the broader community was included in the survey (Table 19). The purpose of the statement was to explore the role that sharing of thoughts and ideas with peers and the broader educational community play in the development of social presence.

Table 19: Student perceptions - Interactive responses

Statement Number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
21	I was able to compare my thoughts and ideas to experts, teachers, guides and/or peers	100%		100%		100%		100%	

It is not surprising that all participants agreed (100%) with statement #21 as they were encouraged to share their thoughts and ideas using a range of social spaces. Data from other sources indicates that they did use a variety of different technologies, as well as face-to-face discussions, to compare their thoughts with others. One participant blogged about a discussion she had with a work colleague:

I found that discussing ideas with my [colleague] we both got quite excited about what we could do - nice to have someone else with an interest in the unit to bounce ideas with (HS-1, Blog).

This participant also sought assistance from their learning development experts at their own university to help them to develop and implement their course design:

Hi BBD people, I'm the unit coordinator for [unit code] and my [colleague] and I are planning some new assessments for the unit. We want to try to use the technology as well as we can and we would like your advice on the best way to set up as we are unsure how to do so (HS-1, Email).

The above conversation is particularly interesting as the request was forwarded onto a staff member in the staff development area, who coincidentally was also a participant in the course, who indicated she would be happy to assist.

Providing a variety of different types of technologies for participants to interact was beneficial, as some participants experienced problems installing specific technologies on their work computers:

I have tried to set up Skype and Diigo on my work computer but I had to apply for admin rights to do so! This wasn't a problem but it hasn't come through yet so it might be a couple more days before I can upload these programs (HS-1, Email).

However, most participants were able to install and use a variety of tools to interact socially with their peers. Following is a comment from one participant about the benefits of using the Skype group chat:

Skype kept me in touch with other participants and the conversations that were happening between other participants. By observing these conversations I was able to answer some of my own questions (Respondent 5-1, #37).

Due to the low number of active participants in the 2nd iteration there was minimal peer-to-peer interaction on the Skype chat. However, some participants did chat one-to-one to seek assistance and bounce ideas off each other and the facilitator:

Using Skype, I found that just by telling [HD-2] what my problem with Diigo was, it gave me time to think it through and solve it myself. It was great to chat to the facilitator on Skype, too, and to get feedback on contributions I had made. (JF-2, Skype).

In both the 2nd and 3rd iterations social interaction was primarily between a specific participant and the facilitator. Some people used it to resolve technical issues:

Hi [facilitator name] I've just posted my week 1 reflection, but still can't read others – is there a time delay? (HD-2, Skype).

Others used it to ask the facilitator about the technologies she used:

Hello [facilitator name], did you use Cam Studio to make the video about Moodle? I would like to do a getting started for my students as well and have a video showing them around the unit (NA-3, Skype).

Cohesive responses

Cohesive responses include the use of vocatives, that is, addressing or referring to participants by name, addressing or referring to the group using inclusive pronouns (such as: we, us, our), or communication that serves purely a social function (such as greetings, closures).

The creation of personal blogs, a Skype chat group and the Diigo group library included in the authentic course were designed to assist participants to interact and collaborate socially in an endeavour to develop group cohesion. Analysis of participant discussions revealed that participants across all iterations frequently used vocatives, emoticons and inclusive pronouns in their responses to others. As expected, the use of inclusive language contributed to a consistent sense of camaraderie and 'realness' between group members that was evident in the 1st iteration of the course (Scialdone, Li, Heckman & Crowston, 2009).

Below is an example of the use of vocatives and emoticons in participant blog posts that illustrate the formation of group cohesion within the 1st iteration of the course:

Hi [HS-1], You could create little videos that answer questions or explain difficult concepts that you could use time and time again... Good luck with your experiment [LD-1, Blog].

And their peer responded:

Thanks [LD-1] ...I am meeting my sessional lecturer this afternoon so will discuss your suggestions with her. We can both come up with some ideas ☺
Thanks for your feedback [HS-1, Blog].

A Skype group chat was included in the course as research indicates synchronous communication is more suited for developing social presence, as it is more closely resembles face-to-face communication (Hrastinski, 2008). The following Skype conversation between a number of participants and the facilitator demonstrates participants in the 1st iteration developed such a good cohesive bond that they were keen to meet face-to-face at an upcoming conference:

I am at the [conference] all day on Thurs and Fri (Facilitator).
So am I!! I'll see you there! ☺ (MP-1)
Oh great maybe we can meet for coffee during the breaks (Facilitator).
That sounds good. It would be nice to meet face 2 face (MP-1).
Yes, it would. Hey BG, LD, CM are you going to the [conference]? (Facilitator).
Yes, I am going (LD-1).
Hi everyone, Yes, I would love to catch up with you all for coffee (CM-1).
OK Thursday is a date, 10.30am morning tea, 1pm lunch or 3.30pm afternoon what suits everyone best? (Facilitator)
Lunch would suit me best (CM-1).
Lunch might be better so that we can all chat for longer (MP-1).
OK let's make it lunch (LD-1).

When participants demonstrate a desire to extend their interactions beyond textual exchanges with members of their online community, a meaningful connection has occurred within the community (Bubb, Crawford & McDonald, 2013).

The blog activity was not included in the 2nd iteration due to time constraints. Instead, the participants were encouraged to socialise collaboratively with each other using the Skype group chat. Although there were very few active participants in the Skype group, the following quote illustrates that participants did feel a sense of belonging with the group, "Hi [facilitator] and everyone. Great to be here as part of this group ☺ "(MO-2, Skype). The facilitator responded that she was currently in Queensland visiting family before a conference.

And the participant replied:

Hi [facilitator name] - oh great – I hope you enjoy your family time. Also, you’ve escaped this coolish Perth weather (cold, cloudy and grey) – so hope there’s some sunshine over there in Queensland for you ☺ (MO-2, Skype).

Another participant also responded to the facilitator’s post:

Great that you have had great weather and been able to spend some time with your brother helping him out. I hope the conference goes well. (HD-2, Skype).

In the 3rd iteration the blog was re-introduced and participants were encouraged to use it for both social and cognitive expression. However, the analysis revealed that most participants used the Skype group chat for social expression and the blog for cognitive expression (discussed in Chapter 7). The development of group cohesion can be seen by the use of phatics (social small talk) in the following example:

Hi everyone – a little hard juggling margaritas in Bali and homework! I will try to keep up (CC-3, Skype).

To which a fellow participant responded using a salutation, irony and an emoticon to indicate humour:

Hi [CC-3], sounds like life is really rough for you at the moment...hope you don’t spill it ☺ (AL-3, Skype).

The survey also included two statements to elicit feedback about the effectiveness of social collaboration as shown in Table 20. The analysis revealed the majority of participants felt they were provided with sufficient opportunities to reflect on and discuss their ideas with others in collaborative social groups.

Table 20: Student perceptions - Social collaboration

Statement Number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
22	I was able to work in collaborative groups that enabled discussion and social reflection	80%	20%	34%	66%	86%	14%	66%	34%
24	The environment provided collaborative group spaces and forums that enabled articulation of ideas	100%		66%	34%	86%	14%	84%	16%

Many participants (66%) indicated that they were able to reflect and express themselves emotionally and socially with others in the course (#22). Although, a few people across all iterations (34%) disagreed, in particular those in the 2nd iteration. A comment from a participant in the 2nd iteration suggests this perceived lack of collaboration may have been due to the small number of active participants rather than the course design:

There were too few participants and so the collaborative aspects were not what I believe they could have been (Respondent 3-2, #39).

All participants in the 1st iteration, and most in the 2nd and 3rd iterations, agreed the environment included collaborative spaces where they could articulate their ideas (#24 – 84%). This suggests that the inclusion of social technologies did support participant collaboration and sharing of ideas. The analysis of the open questions, at the end of the survey, supports this finding. One participant commented on how the technologies facilitated their learning:

The technologies helped to organise my work, collaborate with peers and share ideas and work....plus they also helped with general communication! (Respondent 2-3 #37).

Another participant stated that one of the primary benefits of the learning environment was being able to collaborate, “with other academics from lots of different places!” (Respondent 2-3, #38).

Some people disagreed (16%) with statement #24 and there is some evidence that suggests the limited collaboration may have been due to lack of time to articulate their thoughts, rather than the lack of collaborative spaces within the environment:

Outside of completing my own project-tasks there were many peripheral tasks around engaging with others and the content. These tasks fell by the wayside when I couldn't stick to the schedule (Respondent 4-1, #36).

Another comment from a participant in the 3rd iteration thought the lack of interaction may have been due to the absence of 'structured exercises':

I think the course could have had a stronger group atmosphere or collaborative edge. I know this is tricky, especially with busy working participants, but I have completed distance learning programs in the past that felt more like a real class. Maybe starting the session with a low-value group exercise might have forged more connections, at least with a small group if not the full cohort (Respondent 7-3 #39).

Nevertheless, the consistently high uptake of the collaborative connections and the frequent use of vocatives throughout all three courses indicate that collaboration was a key factor in group cohesion and enhancing online social presence.

Conclusion

The aim of the data analysis discussed in this chapter was to identify the ways in which the components of social presence facilitated the design and delivery of the authentic online professional development course for higher education professionals. All participants agreed that the design of the course enabled them to share their thoughts and ideas, and articulate their growing understanding with their peers about their learning.

Overall, participants seemed more comfortable expressing their feelings and emotions in the Skype chat group, which was only viewable by other participants. However, it was interesting to note that participants in the 1st iteration, in particular, appeared to be just as comfortable sharing their feelings in their personal blogs. This was interesting because the blogs were public and viewable by anyone with an Internet connection.

Being able to interact with their peers in the group social spaces also appears to have aided participants' learning. Even though some people did not contribute to the conversation, being able to view what others had discussed enabled them to learn from others. The social web components also provided the opportunity for people to stay in touch with their peers and to access the learning materials after the course had finished.

Although the tasks were designed to be completed individually, the findings indicate that the inclusion of social applications such as Skype and blogs assisted participants to interact collaboratively. They also assisted them to feel as if they were, “a part of the group” which contributed to the formation of a community of learners in all iterations of the course.

Social presence is one of three aspects of learning investigated during the implementation of an authentic online course described in this study. In the next chapter, the element of *cognitive presence* is analysed and discussed.

Cognitive presence analysis and findings

An analysis of *social presence* and its facilitation in an online learning environment was presented in Chapter 6. A detailed analysis of the data related to *cognitive presence* is presented and discussed in this chapter.

Method of analysis

The same data collection methods, analysis and coding processes described in Chapter 6 were also applied to the analysis of cognitive presence described in this chapter. In particular, course evaluation survey questions were mapped against the elements of authentic learning (see Appendix 28) to identify questions that related to cognitive presence. The survey findings were then corroborated with data from other sources. This determined how the components of cognitive presence facilitated the design and implementation of the authentic online professional development course for higher education professionals. Findings relating to cognitive presence are discussed under *a priori* themes derived from the elements of authentic learning: authentic context, authentic tasks, multiple perspectives and roles, expert performances, reflection, and authentic assessment in the following section.

Cognitive presence in authentic online communities

Garrison et al (2001, p. 7) described cognitive presence as, “the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse”. The CoI model relates cognitive presence to *critical thinking* and focuses on collaborative processes to promote *higher-order* knowledge and skills. Research indicates *cognitive presence* is a major indicator of success in online learning (Garrison et al., 2000).

Authentic context

When creating an authentic context it is important to select a context that reflects a real-world situation that relates to the learning area. The aim of the course was to provide an introduction to the use of real-life tasks where students use technologies as powerful cognitive tools for learning. Participants were asked to immerse themselves in the context of having to develop an interactive and engaging online learning experience (Appendix 20, CILG, p. 5). This was, in fact, the context that many of the lecturers who enrolled in the

course were faced with at their own universities so, as expected, participants responded well to the context and found it useful for helping them to understand the theoretical and practical aspects of an authentic online environment.

A statement relating to the context of the course was included in the survey to elicit responses about the authentic nature of the learning context (see Table 21).

Table 21: Student perceptions - Authentic context

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
1	The course context represented the kind of setting where the skill or knowledge would be applied	100%		100%		100%		100%	

As the course context reflected a real-world context for many of the participants, it was not surprising that all participants agreed (100%) with statement #1. Many participants indicated they used the ideas and products they developed in subsequent work related projects. One participant commented:

I've taken on board some of the ideas mentioned so far. Having previously provided lots of boring information and written assessments I have decided to try to utilise a few interactive ideas for the unit (HS-1, Email).

Another participant mentioned that the course was also relevant to her classroom role and that she had implemented a number of strategies with her current students. In addition, she felt her participation in the course contributed to obtaining a new online teaching position (JF-2, Skype).

Overall, the authentic context of the online course was a critical element of participants' cognitive presence within it. It enabled them to genuinely complete the major task of designing an authentic online unit in the full expectation that the product of the course would be useable, often in the immediate future. Chapter 9 explains in detail how many of the participants implemented ideas, technologies and strategies gleaned from the course into their own teacher practices.

Authentic tasks

Arguably, the central element in the design of the learning environment is the task students are required to perform (Herrington et al., 2010). The overall task participants were required to complete was to plan and document a course outline for an existing or future course they intend to implement. Creating a course or unit outline is a fundamental task that educators involved in designing and implementing online courses would perform in the workplace.

Herrington et al. (2004) identified 10 characteristics to describe the critical components of an authentic task. Eight statements based on the elements of authentic tasks were included in the course survey to elicit responses from participants about the various design elements of the task (see Table 22).

Table 22: Student perceptions - Authentic tasks

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
3	The tasks mirrored the kind of activities performed in real-world applications	100%		100%		100%		100%	
4	The task was presented as an overarching complex problem	100%		100%		100%		100%	
5	The activities required significant investment of my time and intellectual resources	100%		100%		100%		100%	
7	The tasks were ill-defined and open to multiple interpretations	60%	40%	66%	34%	72%	28%	66%	34%
8	The tasks afforded the opportunity to examine the problem from a variety of theoretical and practical	100%		100%		100%		100%	

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
11	The tasks allowed a range and diversity of outcomes open to multiple solutions of an original nature	100%		100%		100%		100%	
19	I was required to make decisions about how to complete the tasks	100%		100%		100%		100%	
28	The activities culminated in the creation of a polished product that would be acceptable in the workplace	100%		100%		100%		100%	
29	The task enabled me to present my finished product (concepts & ideas) to a public audience	100%		66%	34%	86%	14%	84%	16%

A few participants across all iterations disagreed (34%) with statement #7 - *The tasks were ill-defined and open to multiple interpretations*. This was an interesting result because each participant produced a course outline tailored to their specific area of teaching and selected appropriate learning and assessment strategies to suit their context. Appropriately, the end products produced in the course covered a wide range of topics, learning activities and technologies so the task was clearly open to multiple interpretations. Perhaps these few participants were suggesting that the task was not *badly*-defined, which is a common misinterpretation of this element. The following comment indicates this might have been the case:

The words 'ill-defined' jumped off the page. Ill-defined? Was this a typo? Ill-defined jarred because I was expecting the words "well-defined" ...So what exactly is ill-defined? How would such a semester long assignment be structured so that it was "ill-defined"? What would "ill-defined" look like for first year students in comparison with final year or post graduate students? I am uncomfortable with the concept of "ill-defined" activities (NA-3, Blog post).

Most participants agreed (84%) with statement #29 - *The task enabled me to present my finished product (concepts & ideas) to a public audience*. Although a few people in the 2nd and 3rd iterations did not think this was the case (16%). This was an unexpected finding as all participants were asked to publish their tasks on Google Docs with the access set to either “anyone on the web” or “anyone with the link” so that their peers (at least) could provide them with feedback. In this way, their final products were viewable not only by the facilitator, but also by their peers and optionally their friends, family or work colleagues.

All participants agreed the tasks reflected activities that would be performed in a real workplace setting:

I thought the tasks were well designed as they offered real life value - I will certainly be using my task 1 in my delivery of my S2 unit (Respondent 7-3, #38).

They also agreed that the task required them to present a solution to an overarching complex problem that required significant time and cognitive ability to complete:

I was able to redevelop my unit plan and activities in my online unit as part of the course (Respondent 1-3, #38).

They were able to examine the problem from both a theoretical and practical viewpoint. One person commented they were able to apply, “their newly gained knowledge to authentic tasks” (Respondent 4-3, #36) and another said:

I learned a great deal about authentic tasks and authentic assessment, about which I knew little before commencing [the course] (Respondent 7-3, #36).

The finished products created allowed a range of diverse products to be created to meet the learner’s specific workplace requirements:

I engaged in an authentic project task creating a course outline that I could use in real life (Respondent 2-3, #36).

The findings appear to support the argument that meaningful real-life tasks that require learners to use higher-level cognitive skills such as analysing, synthesizing, and creating can contribute to better learning outcomes. For example, one person explained how the course tasks helped her to understand how to create more engaging tasks in her own teaching:

I have found your course really helpful and am trying to put much of it into practice! :-) We decided to break them into groups and break the assignments up so half do the video presentation in first half of semester and the others do their news item discussion and then they alternate for second half. The advice to

use a task list and to get them to post on wikis was good too. I've set a wiki up for each group (HS-1, Email).

Using the elements of authentic tasks to guide the design of the tasks ensured that the course tasks were both challenging and engaging.

Collaborative construction of knowledge

Providing opportunities for learners to collaboratively construct knowledge is an important element of authentic learning (Hooper, 1992). In an environment where learners are expected to produce individual products, providing social spaces where learners can discuss concepts and issues and observe others skills at various levels can also contribute to collaborative construction of knowledge (Jonassen, 1995).

The course evaluation survey included two questions, shown in Table 23, to determine the value of providing learners with collaborative spaces where they could discuss and articulate their understanding and collaborate on the tasks.

Table 23: Student perceptions - Collaboration

Statement Number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
17	I was provided with sufficient opportunities to collaborate (rather than simply cooperate) on tasks	80%	20%	66%	34%	100%		82%	18%
23	The tasks required me to discuss and articulate my beliefs and growing understanding	100%		100%		100%		100%	

Although the overall course task did not require participants to work together to create a collaborative end product, collaborative construction of knowledge was encouraged through activities on the discussion forums, participant-created blogs and peer reviews conducted using Google Drive. The following quote illustrates one participant's growing understanding of the importance of selecting appropriate online communication technologies:

I thought the research paper on the use of Skype was interesting and I think it is important to consider how many different means of communication are provided for students. If both Skype and LMS are being used... keeping track of what has been shared in which forum may become difficult. As I work through this course I'll consider which of the two I think will work best for my course, and whether to use one or both (HD-2, Forum).

Participants uploaded their finished task products to Google drive for peer review. One participant commented that being able to view others work, "helped guide my thinking of the task" (Respondent. 5-1, #36). Others advised that they collaborated with their peers by, "sharing readings and reflections on Diigo" (Respondent 2-2, #36) and engaging in, "peer review and reflection" (Respondent 2-3, #36).

In the 1st iteration of the course in particular, it was evident blogging was a good pedagogical strategy for assisting reflection, articulation and collaborative construction of knowledge. Many participants were challenged by the course readings and articulated their developing understanding of the concepts in their blog posts. For example, one participant described her discovery of the conative domain after relating Bloom's taxonomy to her own knowledge of teaching:

For all the fantastic ideas I collect, the elusive prize remains the secret to willing student participation. That sent me scurrying off, bushy tail twitching with mild irritation, to Google "conative domain" to be sure I knew what I was talking (thinking) about, and found Tom Reeves' paper on Technology and the Conative Learning Domain in Undergraduate Education. After a quick scan of Reeves' paper I felt somewhat vindicated in my criticism of Churches since Reeves laments that teaching in higher education institutions is primarily focused solely on the cognitive domain, and even then mostly on the lower half (LD-1, Blog).

They also actively reflected on and engaged in meaningful dialogues about some of the learning concepts, such as the participant who responded to the post above with her own developing ideas about motivation:

the main task within this course, to plan and create a detailed online course to present to colleagues, has and will continue to require a high level of intrinsic motivation. Light bulb moment - I am now starting to think that harnessing student's intrinsic motivation is the key to student participation (MP-1, Blog).

During the 2nd iteration of the course, participants were asked to reflect on their learning and share their thoughts in the weekly discussion forums. Many people wrote brief reflections about their learning or the readings in Week 1. In these reflections they primarily discussed the learning strategies and tools they discovered:

I have already gained a lot and learned new strategies from Week 1. ... I've also found a few new tools that I'm keen to try out (RS-2, Forum).

However, only two people posted comments for Week 2 and no-one posted in Weeks 3 or 4. Unlike the blog activity in the 1st iteration, participants did not comment on other's forum posts or offer helpful suggestions and support. It appears the method of articulation (blog vs. discussion forum) may have had an impact on the depth of thought and level of interaction. Although the blog was more time consuming, the public expression of ideas and knowledge seems to have encouraged participants to think more deeply before articulating their thoughts. This ignited a greater level of learner interaction, as opposed to simply recording their thoughts and responses in a closed discussion forum.

In the 3rd iteration, participant blogs were again used as the primary space for collaborative construction of knowledge. Specific reading activities involving the use of protocols were introduced to encourage students to think more deeply about the concepts and to articulate their understanding of the readings and their own teaching and learning strategies. Participants were asked to select a quote from a reading of their choice and post it on their blog. Then two other participants were asked to provide their thoughts about the selected quote by adding comments to the original blog post.

The reading activities were optional, however, many participants completed either one or both of these activities. Most blog posts and the associated comments clearly indicated that participants reflected deeply on the content of the readings and engaged in collaborative construction of knowledge with their peers. One example demonstrating the quality of reflection and engagement is provided in Appendix 29. It appears the use of a protocol was effective in promoting meaningful interaction because it encouraged participants to reflect on the concepts covered in the readings, articulate their understanding and share their own experiences and thoughts about online teaching practices with their peers.

The primary purpose of including the Skype group chat was to encourage social interaction. However, some participants also used this technology to engage in academic discussions with their peers and the facilitator about the content of the course. The following conversation demonstrates how the Skype group chat supported cognitive presence:

Student BG-1: So, if you had to provide 5 key principles/practices to effective elearning, what would they be? Authentic task/assessment?

Facilitator response: The facilitator listed 5 items and finished with "there are more aspects, but you asked for my top 5 ☺."

The conversation continued for about 10 minutes discussing various principles and practices that could have an impact on effective eLearning.

Multiple roles & perspectives

In order for learners to comprehend the complexity of an authentic task and to engage higher cognitive processes, it is important to expose them to different perspectives and broader understandings that differences of opinion can provide (Herrington et al., 2010; E. Murphy, 2003). Thus, the course included links to a range of online readings, supports and resources to allow participants to explore the concepts from a variety of perspectives, and participants were also encouraged to conduct their own searches.

Peer review is another strategy that can be employed to offer learners different perspectives as they can adopt the role of a teacher when they review their peers' work, and conversely, the role of a learner when they receive a critique from their peers (Keppell, Au, Ma & Chan, 2006). Two peer review tasks were included in the course to enable learners to view how their peers interpreted the tasks and to obtain feedback from each other.

The course survey included four statements related to multiple perspectives as shown in Table 24.

Table 24: Student perceptions - Multiple perspectives

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
6	I was able to choose information from a variety of inputs, including relevant and irrelevant sources	80%	20%	100%		100%		93%	7%
9	I was required to take on diverse roles across different domains of knowledge in order to complete the tasks	80%	20%	100%		85%	15%	88%	12%
14	I was able to hear and share stories about professional	100%		66%	34%	72%	28%	79%	21%

	practice								
15	I was able to explore issues from different viewpoints	80%	20%	66%	34%	100%		82%	18%

Most participants agreed they were able to choose information from a variety of different sources (#6) although, one participant (20%) in the 1st iteration did not think they were able to. There is no supporting evidence to indicate why they disagreed with this statement. Maybe they thought the variety of resources portrayed the same perspectives or perhaps they perceived all sources of information to be relevant.

A few participants (12%) felt they did not need to take on roles from across different domains of knowledge to complete the tasks. However, the majority of participants (88%) agreed that they did, and other supporting evidence indicates that they switched between being a learner in the course and a teacher in their own course. They subsequently looked at the concepts and tasks from these different perspectives.

The following comment illustrates how one participant reflected on her struggle with managing the amount of information she was accessing throughout the course (learner perspective) and then what she could do to assist her students in the same situation (teacher perspective):

I've also been thinking about this [how to organise information] from the learner's perspective and trying to put myself in the position of one of my students. I think I will need to do lots of work providing scaffolding and examples of using technology (CM-1, Blog).

Another participant commented that she discovered that immersing herself in the role of a student helped her to identify issues such as student motivation and engagement, issues that she would need to manage in her own courses:

I guess what is obvious to me is that ultimately I felt like a typical student - the focus very quickly became about completing the required task, and not about engaging with the deeper elements of my learning experience (reflecting, collaborating, supporting peers, etc.). It truly raises the question for me as a teacher - if I find the conative aspects so difficult to sustain as a student, how can I sustain them in my own students? (Respondent 4-1, #39)

Despite her concerns about maintaining motivation, the above participant also commented that she found that authentic learning, “made the process so very much more meaningful and motivating than other approaches” (Respondent 4-1, #39).

The recommended course resources and web links included stories about professional practice and all iterations of the course provided participants with access to a range of communication spaces (e.g., forums, Skype discussion, blogs). In these communication spaces they were encouraged to share their thoughts about their own teaching practises and their learning in the course.

All participants in the 1st iteration of the course agreed (100%) that they were able to hear and share stories about professional practice. Analysis of data collected from the social spaces (forums, Skype, blogs) corroborates that participants in the 1st iteration shared their teaching experiences primarily in their public blog posts and comments.

A few participants in both the 2nd (34%) and 3rd (28%) iterations did not agree that they were able to share stories about their teaching practices. Analysis of other supporting data found that fewer participants in the second and third iterations shared information about their teaching experiences. Why this occurred is not known, although the following comment by a participant in the 2nd iteration suggests that the low number of active participants may have contributed to the lack of interaction and sharing:

I felt the small number of participants a difficulty as the activities were well designed to encourage sharing, collaboration, discussion but the numbers in the course didn't result in it happening very well (Respondent 2-2, #39).

In the 3rd iteration participants were encouraged to use their blog to reflect on specific articles as well as their teaching and learning practises. Analysis of the content of participant blogs indicates most people did reflect on the content of the articles, but few shared stories about their own teaching and learning or how they could use the concepts from the readings in their own courses.

Providing access to a range of open educational resources enabled the majority of participants to view information and concepts from multiple perspectives and encouraged them to source their own readings and share their understanding with their peers. One participant blogged her understanding of the role of the teacher in a connectivist learning environment:

If I look at Connectivism from a very raw standpoint, the role of the teacher becomes to 'facilitate' the vast array of information that students obtain from their connections and networks (social media) and from the World Wide Web. The teachers role turns into one of facilitating, directing, steering, filtering and sense-making while still providing a "narrative of coherence" as Siemens calls it, for students in the pertinent discipline (MP-1, Blog).

Another participant contributed their thoughts about effective online facilitation and suggested that educators new to online learning need training support in this area:

I believe that teachers need to facilitate, steer, guide and model managing the technological and information rich world in which we now live. I also think, that facilitation is a complex skill that is easy to talk about but much harder to do effectively. Skillful facilitators are quite rare, and the skills required often need to be explicitly taught to support educators in this new part of their role (AC-1, Blog).

The above comments indicate the course did indeed encourage participants to view online learning from both a teaching and a learning perspective.

Reflection and articulation

Reflection and articulation are another two key elements of authentic learning that contribute to successful task performance. Communication provides learners with the opportunity to share and check their understanding with others to help them process their internal thoughts (Vygotsky, 1978).

Opportunities for reflection and articulation were provided through the completion of a complex task and an online reflective journal. Schon (1987) proposed that reflective thinking about learning occurs both *in action*—during the event, and *on action*—after the event. The authentic nature of the tasks encouraged participants to not only reflect on the content—*reflection in action*—to analyse and synthesise information to complete the tasks, but also to reflect on the products their peers produced—*reflection on action*—to evaluate their work. The online reflective journal required participants to reflect on and articulate their own learning and teaching processes—*reflection on action*.

All participants across all iterations of the course (100%) agreed that they were provided with sufficient opportunities to reflect on the course content and their own learning (see Table 25).

Table 25: Student perceptions - Reflection

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 (5)		2 (3)		3 (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
18	I was provided with sufficient opportunities to reflect on the course content and my own learning	100%		100%		100%		100%	

Statement #18 does not capture information about the level of reflection learners engaged in. However, data from other sources demonstrates that participants reflected not only on what they did (reflection on action), but also about their process of learning, the choices they made and how they approached the tasks (reflection in action) as can be seen in the following comment:

I reflected not only on the readings but also on my own teaching and on how I construct my units (Respondent 1-3, #36).

Another participant reflected on the technologies she was using and described how, at first, she struggled to understand concepts associated with blogging:

I created a blog but I have no idea if it is attached to the course website or is out there for everyone to read (HS-1, Blog).

Later in the course it became evident that she felt more confident with this technology and its pedagogical application, as she also commented she had set up a blog for her own students to use:

My students have always had to submit a reflective journal so I thought they might like to do this in the form of a blog. I have set up a blog within Blackboard for one of my units this semester and I think I will link some of the information we've been provided [in this course] to my site so they have more information about what standard I expect. I've already given them information about reflective writing so the combination should be helpful (HS-1, Blog).

Evidence of another example of *reflection on action* was a blog post where a participant reflected on their learning progress towards the end of the course:

As I begin to complete the final tasks for this course I have been reflecting on the following; how much I have learnt, how much I have been inspired and my hopes for the future (CM-1, Blog).

Other participants reflected on their growing understanding of authentic learning. One person also wrote about how surprised she was at how much she and a fellow participant had learnt during the course without realising it:

Now that I'm feeling a little more well-informed about authentic eLearning, opportunities to throw it into the conversation seem to be popping up all over the place in my workplace. The first time this happened (about a week ago) I found I was struggling to succinctly articulate what authentic learning is, and yet today a fellow eDesign course participant and I very confidently advised a colleague of ours that authentic learning was an approach better suited to her online delivery plans than experiential learning. We were able to clearly articulate how it might work in the context she was describing, and she liked the sound of it. So for me this was a signal moment in my (authentic) learning journey and it reminded me that often we don't realise how much we have learned until the knowledge springs forth unsolicited! (LD-1, Blog).

The above quotation is a powerful example of the psychological axiom “I learn what I believe as I hear myself speak” (cited in Herrington et al., 2010, p. 32) and the important role articulation plays in the learning process. This supports the notion that discourse is an essential component for triggering internal higher mental functions such as critical thinking and reflective reasoning that can contribute to cognitive development (Vygotsky, 1978).

Participants in the 1st and 3rd iterations of the course primarily used their blog to reflect on and articulate their thoughts about the readings. A participant commented:

I have just finished reading the article on Authentic eLearning in Higher Education. It left me pondering the causal links between the arguments given by educators and the outcomes we see in final work product. It seems that there is often pinpointed a particular reason for the lack of uptake of a theory (or technology, idea etc.) and it never seems that clear cut to me....In a student as client environment I can see where many educators find the idea of traversing the gap between the traditional, familiar, student accepted norm over to the scary, new world of problems and situations to be daunting... Shouldn't life be a little more messy and organic, even in the hallowed halls of academia? (AC-1, Blog).

A few people also used the Skype chat to reflect on how technology is changing the way we teach:

I wonder if we'll move away from lecturers giving students readings and instead create units where students generate the reading list as they progress (BG-1, Skype).

Although student created content is an innovative concept that has not yet been widely embraced, examples of how educators have employed technology to implement and support student construction of “Just-in-time-Syllabus” (JiTS) are already accessible on the Internet (Bonk & Khoo, 2014).

In the 2nd iteration of the course the blog was replaced with a Diigo online social bookmarking group and Moodle discussion forums. The Diigo group was a space where participants could reflect and share ideas about the readings, as well as add their own readings to the group library. Weekly discussion forums were created on the Moodle LMS for participants to reflect on their learning and view each other’s posts. Participants were encouraged to articulate their reflections about the readings in the Diigo resource library using the *comments* feature. However, most posts were quite succinct and did not exhibit the depth of thought that was evident in the blog posts in the 1st iteration. The following quote is a typical example of the type of comments posted on the Diigo group in the 2nd iteration:

I found this study to be really interesting and beneficial for providing insight into areas/strategies for developing a community of active learners, especially in the area of synchronous communication (MO-2, Diigo).

Although many participants’ added comments on Diigo about the articles they read, most people simply added their own reflections about the particular readings:

This reading had my head buzzing with ideas of how to use the various suggestions in my course and college. I particularly liked the 'contributing to society' idea, as this is taking business back to its absolute roots of seeing a need, putting together a plan and sourcing funding. Students contributing to the course, or the world, gives them a sense of ownership, which can only enhance their experiences - an aspect we as teachers and lecturers should embrace (JF-2, Diigo).

In the 1st iteration of the course, despite the short duration, participants exhibited deep reflections about both the concepts and their own learning. Reflections in the 2nd iteration lacked the same depth of thought. However, it is unclear whether the limited depth of reflection and conversation among learners in the 2nd iteration may be attributed to the choice of technology or is a result of the low number of active participants. The impact that choice of technology plays in encouraging reflection and articulation warranted further exploration.

A blog activity was re-introduced in the 3rd iteration and a protocol was employed to encourage reflection and articulation about the readings and to share their different perspectives about specific topics. The following blog extract illustrates that participants not

only critically analysed and reflected on the readings, but also shared their personal thoughts about the topics they selected:

Quote: The learning environment needs to provide ill-defined activities which have real-world relevance, and which present a single complex task to be completed over a sustained period of time, rather than a series of shorter disconnected examples (KL-3, Blog).

Justification for selecting quote: My initial interest in this quote was because (amongst other units) I am providing library support into a first semester first year unit for teacher education that has quite a number of varied discrete well defined assessed tasks all requiring students to demonstrate aspects of communication skills. I think that these tasks reinforce each other and they were very likely designed with that in mind by academics who are very well versed in constructivism and pedagogy at the tertiary level, and whilst they don't fit the bill of undefined, that the tasks have in fact been well conceived and student learning in one task is amplified by learning in the other tasks. I would be interested to hear how the academics in this course think that students can be supported in shifting into a learning environment of more ill defined tasks (KL-3, Blog).

There was limited evidence of reflection about their own learning processes, although the following statement suggests some people did reflect on their learning even though they didn't elaborate on the processes they used or what they learnt:

As I have traversed the various blogs related to these readings and week 1 activities I am aware that as much as I have been frustrated with my own clumsiness at navigating blogs and learning courses I have indeed learned some new skills through this process (GM-3, Blog).

Authentic assessment

Authentic assessment is an integral part of an authentic learning environment and assessment should be seamlessly integrated with the activity and tasks learners are required to complete (Herrington et al., 2010). Authentic assessment should mimic workplace practices (Burton, 2009) where people's performance is generally assessed on what they actually *do* in the day-to-day practice of their job role (Govaerts, Van de Wiel, Schuwirth, Van der Vleuten & Muijtjens, 2013).

A recent survey found that the most commonly used method in higher education is paper-and-pencil assessment (Alquraan, 2012). This decontextualized type of assessment is better suited to testing low-level cognitive skill acquisition, such as remembering, understanding and applying knowledge (Gulikers, Bastiaens, & Kirschner, 2004). Using authentic tasks that require learners to use higher-level skills, such as analysing, evaluating and creating, enables educators to assess these higher-level cognitive processes (Mueller, 2005).

No formal assessment or grades were awarded for completing the tasks in this professional development course. However, both the participants and the facilitator provided feedback on the finished products learners produced for both tasks. Participants provided open feedback as part of the peer review activity and the facilitator provided confidential written feedback to individual participants.

There were three survey statements, shown in Table 26, concerned with eliciting feedback about authentic assessment. All participants agreed (100%) that the major task reflected the “application of learning to an authentic outcome” (Respondent 4-3, #38) and that the activities culminated in the creation of a polished product that would be acceptable in the workplace.

Table 26: Student perceptions - Authentic assessment

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
10	Task assessment (evaluation) was seamlessly integrated with the major task in a manner that reflected real-world practices (not separate testing)	100%		100%		100%		100%	
28	The activities culminated in the creation of a polished product that would be acceptable in the workplace	100%		100%		100%		100%	
30	The activities allowed for multiple assessment (evaluation) measures	100%		100%		100%		100%	

Using technology as cognitive tools

In the 1st iteration of the course, participants’ used a blog application of their choice to reflect on and articulate their thoughts about the course content and their learning. Their posts were insightful and meaningful. In a post titled *Online teaching and learning – Friends or Foes?* one participant started her post by writing about her hesitation in commencing her blog:

I have hesitated over starting this blog, not because the process is onerous, but because given the way my mind is flitting around at the moment, I doubt I will have anything useful to share (AC-1, Blog).

Then she continued on to discuss the pros and cons of online learning in detail and provided vivid real-life examples. Contradicting her initial claim, she demonstrated she had an abundance of useful thoughts, ideas and experience to share with others. She believed that the Internet has opened up, “learning in a way that has never been done before” and that “more independent learning opportunities need to be offered”. That online/flexible delivery would be an ideal solution, but that we needed to be, “smarter and more efficient” in developing online courses (AC-1, Blog).

Despite the time required to create their blogs and the limited time participants had to blog about their thoughts during the short course, it appears using a public blog supported meaningful reflection about the content.

In the 2nd iteration, the blog was replaced with a Diigo group where participants could reflect upon and share their understanding of the readings using the comment tool. Most participants posted their reflections about the suggested articles on the Diigo site. However, many posts were quite succinct and did not display the same depth of thought as demonstrated in the blogs of the 1st iteration:

Article: Students as contributors: The digital learning farm.

Comment: Really enjoyed reading about the students creating their screencast recordings to showcase how they solved problems based on material discussed in class. So, yes, the concept of the Digital Learning Farm certainly is a relevant one for many of us who wish to further involve students in their learning processes (MO-2, Diigo).

Collaborative construction of knowledge between participants was also very low in the 2nd iteration. In this iteration there was limited participant interaction and minimal evidence of group cohesion. Only one person commented very briefly on another’s post: “I also enjoyed this article” (HD-2, Diigo), and although this person posed a question no-one responded:

I hadn't come across the concept of learners as designers or the use of technology as cognitive tools, so found the information in this article interesting. Have others used this very much in their teaching? (HD-2, Diigo).

It was unclear if the limited cognitive interaction was due to the minimal sense of community in this iteration, or the affordances of the Diigo tool. However, it was evident that learners did not express the same depth of thought or level of interaction as those in the 1st iteration. This finding contributed to the decision to reinstate a blog tool in the 3rd iteration of the

course, to further investigate its value as a cognitive tool to support learners' collaborative construction of knowledge.

In the 3rd iteration, like the 1st iteration, meaningful reflection and interaction was evident:

Blog post title: Critical factors in designing simulations?

Quote posted: Our research proposes that the physical reality of the learning situation is of less importance than the characteristics of the task design, and the engagement of students in the learning environment (Herrington, Oliver, & Reeves, 2003a). (JG-3, Blog)

Comment 1: With respect to theoretical subjects, I can see that the design of a unit and the tasks required may be more important than the "physical reality of the learning situation." However, with respect to subjects where inter-personal listening skills are important, this statement becomes problematic because active listening involves awareness of subtle physiological and aural clues as well as the actual words spoken. Therefore, ... (NA-3, Blog)

Comment 2: To build on Nancy's comment, I would agree that engaging tasks are certainly more important than the "physical reality" for theoretical subjects. Teaching a history-politics-sociology area studies unit (for which it is quite hard to come up with real-life activities incidentally, hoping for inspiration here!) I have found that a really active group participating in online asynchronous discussions can have more meaningful exchanges and build a more real sense of classroom camaraderie than a particularly shy or unwilling group in a face-to-face tutorial (CS-3, Blog).

It appears the blog application was an effective cognitive tool for supporting learner engagement with both the content and other learners, and it enabled the discussion to flow as a continuous thread on the original post.

Google Drive offers a range of powerful collaboration tools that enable people to share and work together in real-time (Howland, Jonassen, & Marra, 2012; Rowe, Bozalek, & Frantz, 2013). Unlike other collaboration tools such as wikis, two or more people can work on the same page at the same time and you can see others' contributions instantly.

Google Drive was used extensively for all iterations of the course. For example, participants added their blog URL and the URL for the reading activities to Google spread sheets created by the facilitator. Resources, such as the course analysis worksheet and the peer review forms, were created using Google Docs and uploaded to Google Drive by the facilitator to enable easy access to templates to help participants complete the course activities. Participants made copies of the templates using Google Docs and saved their completed files to the course Google Drive folder so that all participants in the course could access and view them.

Google Docs was perceived as a great collaboration tool for, “sharing work and collaborating” (Respondent 3-2, #37) as well as a cognitive tool to assist learners to complete the course tasks:

The Google Docs helped me to complete the task because it enabled me to survey how other people were interpreting the task (Respondent 5-1, #37).

As seen in the following quote, it was evident that the course exposed participants to a range of new technologies that could be used to support cognitive presence, and in doing so they became more confident using and experimenting with these tools in their own teaching:

I will use lots more of the technology available. I will use wikis and blogs as I can now see their purpose. Videos are also now in my repertoire! I know what questions to ask and who to ask them of now (HS-1, Teaching survey).

Conclusion

The aim of the data analysis discussed in this chapter was to identify in what ways the components of cognitive presence facilitated the design and delivery of the authentic online professional development course for higher education professionals. The elements of authentic learning were used as a priori themes to discuss cognitive themes. Learning with technology was another theme that was derived from the framework to discuss how the selected technologies supported the collaborative construction of knowledge. The findings indicated all elements of authentic learning and the selected technologies appeared to support the development of cognitive presence. Thus, it is important to include as many design elements as possible to support effective online learning.

Using an authentic context that participants can relate to and creating real-life tasks that they would perform in their workplace encouraged a deeper understanding of how the learning concepts could be applied in their own work situations. Using meaningful authentic tasks also enabled participants to create products that they could use in their online teaching and helped them to identify more authentic methods for assessing student performance.

Being able to view the content and concepts from multiple perspectives and take on the multiple roles, such as the role of a designer, teacher and learner encouraged cognitive reflection from a variety of perspectives. Exposure to different levels of expertise, (such as Herrington’s authentic learning videos) and modelling of processes, (such as example completed analysis and course outline products) enabled participants to observe how an experienced online course designer would approach the task and gave them greater confidence in their ability to perform the tasks themselves.

Using technology as cognitive tools to research, reflect and produce their final products provided participants with the opportunity to learn new technologies, as well as first-hand experience into how they could be employed in an online environment to promote student learning. An authentic online learning environment that incorporates advanced educational applications can encourage cognitive independence. However, developing, “a committed, motivated and responsive community of inquiry” (Kleimola & Leppisaari, 2008, p. 3431) does not happen automatically. Cognitive presence is also strongly influenced by elements of teaching presence (Kozan & Richardson, 2014) and the following chapter discusses the research findings related to teaching presence.

Teaching presence analysis and findings

The establishment of *teaching presence* in an online learning environment is a key ingredient for successful online learning (Gorsky & Blau, 2009) as studies have shown that instructor presence plays a significant role in supporting student learning (Baker, 2010; Bartruff & Headley, 2009; Garrison, 2007). Teacher presence acts, “as a catalyst for influencing student motivation, active learning and participation amongst students, and the achievement of learning outcomes” (Baker, 2010, p. 3). This chapter presents a detailed analysis of the data related to teaching presence.

Analysis method

The same data collection methods, analysis and coding processes used to analyse social presence in Chapter 7 were also applied to the analysis of teaching presence data. *A priori* codes used to categorise the data were derived from the course evaluation survey questions related to teaching presence (see Appendix 28) and the teaching presence components incorporated in the *draft authentic online learning framework* discussed in Chapter 4 (see Table 4, p.73). Due to the large volume of data, quotations were selected to illustrate a particular point of view or a common theme (Miles & Huberman, 1994).

Teaching presence in authentic online communities

Anderson, Liam, Garrison and Archer (2001) describe teaching presence as, “the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (p. 5). Components of teaching presence encompassed in the draft framework included: designing the course, managing learning activities, facilitating student learning, including expert performances, modelling of processes, promoting conation, selecting learning materials and resources and providing access to technological affordances and support. Data findings for each of the components of teaching presence are discussed in detail in the following sections.

Authentic learning environment

In an authentic learning environment the learner primarily determines the learning that occurs. However, it is the teacher's role to create an environment that will help to support and guide their learning. "Creating an online environment that encourages social presence is one way to enhance interactions between students and the instructor, dispel feelings of aloneness, and significantly increase cognitive learning" (De Gagne & Walters, 2009).

The course evaluation survey included four statements to identify the effectiveness of the teaching strategies included in the authentic learning environment. The statements and participant's responses are shown in Table 27.

Table 27: Student perceptions - Course environment

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
2	The course environment provided a flexible pathway, where I was able to move around at will	100%		100%		100%		100%	
20	I was able to move freely in the environment and return to any element to act upon reflection	100%		100%		100%		100%	
25	The environment enabled more knowledgeable learners to assist with coaching	100%		66%	34%	100%		89%	11%
31	I felt comfortable learning in an open environment	80%	20%	100%		86%	14%	88%	12%

All participants agreed (100%) that the flexibility of the course design enabled them to move freely around the learning environment and return to any element at any time. However, secondary evidence collected from the qualitative survey question Q39 (discussed in Chapter 4) and the participant blogs, indicated that some participants initially struggled with the affordances of an authentic learning environment.

More conventional online courses are usually designed on traditional models of instruction requiring learners' to move through the course content on a weekly basis in a linear fashion (Johnson & Aragon, 2003). Therefore, it was not surprising to find that some students initially struggled with the flexible pathways of the authentic learning environment. One participant commented:

One of the most powerful learning "moments" has already occurred for me - I have learnt that I am a hopelessly linear learner and I like to know what the "rules" are in any given learning situation (LD-1, Blog).

Although the course included signposts and support resources to help participants navigate the multiple facets of the learning environment, this participant indicated how anxious she felt at being exposed to an authentic learning environment for the first time. She stated, "I assumed the design of this course was a little flawed, because the instructions weren't clear" (LD-1, Blog). However, after a conversation with the facilitator (on the Skype group chat) she came to realise this flexible student-centred learning approach gave her control of—and responsibility for—her own learning:

I fully understood the why's of her course design, the essence of authentic learning, the intended nature of the task, and the challenge to my way of learning it was going to represent. The fact that there is no right way leaves it up to me to decide how I approach it, how I complete it, and what I learn from it (LD-1, Blog).

Sharing their thoughts and feelings about authentic online learning from a student perspective encouraged participants to reflect on their own course environments and begin to question whether their existing structures and pedagogies were hindering their students' abilities to become more self-directed learners:

Nice to know I'm not the only linear learner. And so reassuring to have a label for myself as well. I tend to panic with lack of structure and I think I impose this on my students a bit too at times. Maybe I'm not giving them enough latitude to learn for themselves because I'm so worried it's all my responsibility? (HS-1, Blog).

Most participants (89%) agreed that the learning environment enabled other learners to assist with coaching. This finding was not surprising as encouraging learners to take on multiple roles and learn from different perspectives is a key element of an authentic learning environment. At the beginning of each iteration of the course, the facilitator strongly encouraged participants to answer each others' questions in the discussion forums and on the Skype chat. The following communication between two participants in the Skype group chat provides an example of participant coaching:

Hi [facilitator name], if I want to set up a similar coffee chat area [group Skype chat] for my students, how do I go about doing this? (AL-3, Skype).

[AL-3], you first need your students in your Skype contacts list, then you can use the toolbar to create a group chat: Contacts >> Create new group (DG-3, Skype).

Many participants agreed with statement #31 *I felt comfortable learning in an open environment* (88%). The following response to question #40 *Any other comments*, suggests exposing participants to open learning technologies opened their eyes to the potential of using open web spaces to support authentic learning:

Though not mastered in the tools, my world has become a bit bigger. Coming from a world where I can touch pages, flip through books and find my place again in what seems real, I have learnt that the virtual, online world has a place to capture and share the real world very widely (Respondent 3-3, #40).

A few participants disagreed (12%) with statement #31. One participant expressed their concern about security when working in an open environment:

Merging everything with my Gmail account has left me feeling slightly vulnerable. Who else can see what? I'm linked and not 100% sure my settings are protective enough. Perhaps my students may find it easier than me? (LB-3, Blog).

However, this same participant finished her comment with, "Although, I really like the wiki idea" (LB-3, Blog). Her final statement suggests she appreciated the affordances of using an open web space, such as a wiki, to facilitate group collaborative learning, despite her concerns about security.

Another participant indicated that once they started working in an open web space, they felt more comfortable, "establishing a blog decreased the 'fear factor' of engaging in this environment" (Respondent 3-3 #38). Publishing their own work and reflections on the open web also encouraged participants to think more deeply about how they might use open web tools to connect with an authentic audience to share ideas and support each other. For example one person stated:

I hope this blog will eventually provide a platform for researchers to connect with each other (and future employers), share ideas and personal experiences (good or bad)! (NAy-3, Blog).

The open companion website enabled a more flexible course design that was focused on the task the learners were required to complete, rather than the tools. Although participants

were not required to create their own websites for this course, they saw the benefits of using such a site, and were inspired to create open websites for their own courses:

I was inspired by the companion website for this course and so have created companion websites for two of my units. I love that I can put everything in the one place for students, include web links and YouTube videos, and guide their learning with more online scaffolding (without having to learn HTML or use Dreamweaver!) (CM-1, Blog).

All of the recommended readings and most of the support resources and technologies were openly available to anyone with access to the Internet. The use of a range of open access readings enabled learner's ongoing access to the resources. One participant commented on the importance of, "being able to access information after the course" (BG-1, Skype). He also expressed his surprise at the quality of the resources freely available on the web to support student learning:

I'm impressed by the quality of the readings and that they are openly available. It's great to share quality reading material (BG-1, Skype).

Despite the anxieties a few participants raised, most agreed the authentic learning environment was effective in supporting their learning and exposing them to new ways of making their own courses more interactive and engaging:

Without doubt, this has been a huge learning journey, which I have been able to engage with at my own pace. This in turn allows time for reflection, making mistakes (!), exploration, problem solving and imagination. This experience has been a huge eye-opener as to the possibilities for more engaging, motivating and authentic learning experiences for students (CM-1, Blog).

Managing learning activities

Managing learning activities includes scheduling and timetabling, creating instructions and procedures, posting announcements and responding to student enquiries. There were no specific statements in the course evaluation survey about managing learning activities. Although the open survey questions provided the opportunity for participants to comment on some of these aspects.

Many learners employed time management strategies to complete the tasks and activities within the suggested timeframes. One person commented, "throughout, I was required to manage my time and meet deadlines" (Respondent 1-3, #36). Another indicated that they implemented a personalised timetable to help them structure the workload to fit within their already hectic schedule:

I tried to create structure for myself in what was a fairly unstructured environment e.g., sequential tasks lists and timetables to keep up with everything that had to be done (Respondent 4-1, #36).

Some of the issues participants encountered in relation managing their learning within an authentic learning environment were discussed in detail in Chapter 4.

Facilitating participant learning

Another aspect of teaching presence is facilitating participant learning to help them achieve the course objectives. Facilitator roles may include guiding and mentoring, coaching and scaffolding, facilitating teamwork and collaborative activities, monitoring progress and providing feedback (Baker, 2010).

Pedagogical methods instantiated in the course to help facilitate participant learning included: personalised just-in-time screencasts to coach participants when required, timely responses to questions, scaffolding of tasks, examples of finished products, contextualised support, real-time open and honest communication and individual feedback.

Two questions regarding facilitator support were included in the course evaluation survey and these are shown below in Table 28.

Table 28: Student perceptions - Facilitator support

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
26	The facilitator provided contextual support and guidance	100%		100%		100%		100%	
27	The facilitator provided timely and helpful feedback	100%		100%		100%		100%	

Participants in all iterations of the course agreed (100%) the facilitator provided good support and guidance, and timely and helpful feedback. This finding is corroborated by data collected from other sources (e.g., short answer question responses, emails, Skype chat) and indicates facilitator support was highly regarded by participants.

Scaffolding of tasks to progressively move learners towards a stronger understanding of the concepts covered in the course was identified as a contributing factor for effective participant learning, as can be seen in the following comment:

The strongest aspect of the course was the scaffolding of authentic learning. For me the course was authentic learning in action (Respondent 1-3, #38).

Participants also pondered the importance of coaching and scaffolding for their own courses. One person reflected on how time consuming scaffolding could be when designing authentic learning experiences and shared ideas about how to streamline the scaffolding and coaching aspects:

The scaffolding aspect can be time consuming, so creating re-usable resources is a great idea. In fact, I think this is facilitated by online learning because you can readily store and access your resources in the one place over an extended period of time. This year I have made website creation the main activity for the year, so I am keen to see how my students undertake this task and what kind and level of support they will need (BG-1, Blog).

Others commented on how the short personalised screencasts provided contextual coaching when they needed help. One advised:

Thanks for the video. I now understand the private chat arrangement as opposed to group chat. I'll play around with Skype and see if I can add others in the group to my Skype contacts too. I appreciate the detailed replies to my problems (MW-3, Email).

Another expressed how helpful it was to be given a personalised response:

It was like she was right there beside me helping me work out how to do it. This is a useful experience for me because I would have assumed it was onerous to do an individual video, but apparently not (HS-1, Blog).

Viewing the screencasts created by the facilitator prompted some participants to reflect on how they could use these strategies to support their own students. One person commented on the benefits of using Jing screencasts to assist student navigate around their course:

I've found the short Jing demonstrations great. My students have consistently expressed confusion about using the LMS (maybe they are as technically inexperienced as I am) and so I can see that using something like this would greatly reduce the stress they experience (HD-2, Forum).

Another reflected on the affordances of video technology for providing feedback to her students:

I can see it could be useful to ensure students get the right points out of my feedback. I sometimes wonder if they read written feedback and/or get the key points I'm trying to make. A recording would be easier for them and much clearer. ...I can put a quick 'hello' video or explain complex issues, I never realised it was so easy (HS-1, Blog).

This blog post sparked a flurry of supportive comments from her peers eager to share their ideas and knowledge about how videos could be used to support student learning. One person shared the method they used to record videos and created a YouTube channel to store video:

I'm pretty new to all this as well and have started to experiment with the video recording. It is so easy to do - I record using the Quicktime player that came with my computer. I have created a YouTube channel where I store my videos and then provide a link to the video One problem with this is that I find it so enjoyable ... I find myself working longer than I ought to! (BG-1, Blog).

Another commented on how a lecturer at their university was using videos to provide students with feedback and how feedback of this nature is much more highly valued by students. This person also suggested how they could be recorded as re-usable resources:

These are a fantastic re-usable resource if you are careful not to mention things in them that become out of date by the next semester. So you could create for yourself a little "bank" of videos to use time and again (LD-1, Blog).

The facilitator also provided examples of other pedagogical strategies such as real-time communication and file sharing to encourage participants to think about how they might use these strategies in their own courses. The following comment illustrates how one participant was inspired to set-up a Diigo library after seeing how the Diigo group library resource was used in this course:

Thanks for sharing some examples from your Library here. It helps as it makes it seem less daunting now to set a Library up for resource sharing - I'm looking forward to setting up my Library now (MO-2, Diigo).

Participants in all iterations of the course agreed (100%) the facilitator provided timely and helpful feedback. The following comment demonstrates how one participant valued the constructive feedback and suggestions for improvement:

I like your suggestions. I was unsure about limiting it to only one attribute, as some units may not be able to demonstrate evidence of all of them. This gives it more flexibility (MP-1, Email).

Feedback provided by the facilitator prompted another learner to think more deeply about the potential for incorporating more authentic elements in her own teaching:

Just wanted to say thanks for the feedback on my analysis. I will think, reflect and think some more (CM-1, Skype).

Another used the Skype chat to check with the facilitator that they were on the “right track” for completing the course tasks. She identified herself as someone who was obsessive about “getting it right” and had a long discussion with the facilitator about her proposed scenario for Task 1:

OK. So I am on the right track if I think in terms of an overarching major task of re-designing an existing unit, based on a particular problem that needs addressing, like communication methods, and then have sub-tasks around structuring the site, designing an activity, creating scaffolds etc? (LD-1, Skype).

Although the above conversation was only between the facilitator and one participant, all members in the Skype group could view the text chat conversation. A few days after the above exchange, another student requested confirmation that she was “on the right track” (MP-1, Skype) before making her work viewable by her peers.

There is usually no one correct solution when completing authentic tasks as learners are given the freedom to make choices and decisions to suit their individual situations. However, from experience, it is common for students who are exposed to authentic learning pedagogies for the first time to seek reassurance from the facilitator, or their peers, that they are “on the right track”, especially when their work is being published on the public web and is accessible to the broader community.

Some participants also indicated that the facilitator’s interaction and monitoring of progress helped them feel more connected and less isolated in the online environment. One person stated:

The interaction with the facilitator.[she] was quick to respond, and appeared to be regularly monitoring all activity. This gave a feeling that she was 'close by', 'to hand for questions', which was very reassuring (Respondent 3-3, #38).

Numerous comments about the “excellent” (Respondent 1-1, #38) and “fantastic” (Respondent 5-3, #38) facilitator support indicated that facilitator immediacy was important for supporting learners in the online environment. However, the following comment suggests that this is not always the case:

The consistent and always convenient access to the instructor. I suspect we were very lucky to have such ready, frequent and enthusiastic support (Respondent 4-1, #38).

Expert performances and modelling of processes

Herrington et al. (2010) stress the importance of providing opportunities for learners to access expert performances and to compare their performance with others at various levels of expertise. To provide these opportunities, learners were encouraged to read a range of articles and view videos created by experts in the field. They were also given access to a range of open educational resources created by the facilitator, such as examples of finished polished products. This enabled them to observe how an experienced course designer completed these activities before they attempted to complete the tasks themselves. Both course tasks required participants to review a peer's completed task, which enabled them to view how others had interpreted the task. The facilitator examples and peer work offered participants the opportunity to view the completed tasks at various levels of expertise.

Two statements in the survey were designed to elicit student viewpoints about expert performances (see Table 29).

Table 29: Student perceptions - Expert performances

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
12	The learning environment provided access to expert skill and opinion	100%		100%		100%		100%	
13	The learning environment allowed access to other learners at various stages of expertise	100%		100%		100%		100%	

Most participants agreed (95%) that the learning environment allowed them access to various levels of expertise and expert opinions. The following participant's comment indicates that access to completed (expert) examples was very helpful:

Having the research examples certainly helped me when I began filling out the analysis worksheet. The learning outcomes were already in place for the unit but I was able to use the resources to go through them carefully to make sure they covered the learning objectives of the unit (RS-2, Forum post).

Although participants primarily worked individually to complete the tasks, they were encouraged to peer review each other's work and share their thoughts about the readings and their own experiences with each other via the blogs, Diigo comments and forums. All participants agreed (100%) that they had access to other learners at various stages of expertise and many people shared their thoughts and experiences, which was appreciated by their peers:

I appreciate being able to hear of others experiences who already teach online and how we have to individualize tools and techniques, often by trial and error, and how dynamic and flexible is the ongoing commitment to student learning (GM-3, Blog post).

Evidence of sharing was also found in responses to the course survey question #36 *What strategies did you use during the course?* One person stated, "sharing readings and reflection in Diigo" (Respondent 2-2, #36) and another identified, "collaborative learning and peer review" (Respondent 2-3, #36). These comments indicate that participants were able to view their peer's work, which exposed them to different levels of expertise.

Learning resources and materials

In an authentic learning environment, it is important to include access to a range of different task and support resources to enable learners to view the concepts from different perspectives and use the resources for multiple purposes. It is also important to include a variety of resources to assist learners to extend their existing knowledge and support their learning. Learning resources may include articles, papers, books, notes, documents, manuals, references, web links, case studies, lectures, audio and video files.

Three types of resources were included in the course: conceptual resources, task resources and support resources. Most of the resources were open educational resources (OERs) that learners could access before, during and after the course. Specific resources included: task instructions, links to online articles, links to open websites, educational blogs, open web technologies that learners could use as cognitive tools to assist them to complete the tasks, evaluation templates, analysis guidelines, blog guidelines and video tutorials. Examples of learning materials and links to open educational resources are provided in Appendix 30.

Two statements in the survey related to learning materials and resources. These are shown below in Table 30.

Table 30: Student perceptions - Learning materials and resources

Statement Number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
16	I was able to use the learning resources and materials for multiple purposes	100%		100%		100%		100%	
33	The recommended readings were useful for learning about the concepts covered in the course	100%		100%		100%		100%	

All participants across all iterations of the course agreed (100%) that the learning materials and resources provided assisted their learning. One person commented that they found the recommended readings useful:

I am finding it helpful to more fully understand the pedagogy behind authentic learning and authentic tasks, especially in relation to e-learning (KL-3, blog).

Another mentioned that the recommended readings not only provided ideas about how the affordances of new technologies could be used to support student learning, but also helped them formulate ideas about how they could be used to encourage learner interaction and engagement:

Certainly the readings for the e-learning course I am now completing provide a useful guide to effectively harnessing the tools and functionalities of Web 2.0 so as to optimise student learning. These ideas have begun to inform the design of my unit, where I attempt to use the Internet and its resources to encourage learner interaction, discussion, collaboration and engagement in a semester long authentic task (BG-1, Blog).

Many participants indicated they found the resources useful not only to help them complete the course tasks, but also for other purposes. One person said:

The info sheet on how to write a blog that the facilitator provided us with is annoyingly good. It means I might have to find something meaningful to say! Do you think she would mind if I share her PDF with others? (HP-3, Blog).

Another commented:

I'm impressed by the quality of the readings and that they are openly available.
...I'll definitely be referring to the readings and work I've been doing for
sometime to come (BG-1, Skype).

The learning environment also included resources to assist learners with developing their conative skills and these are discussed in the following section.

Conative support

Many learners are not equipped with the conative skills that are required for successful online learning (North, 2014). Given the complex nature of authentic learning, it is crucial for teachers to support the development of skills associated with conation (Huitt & Cain, 2005) such as self-regulation and motivation (Shea & Bidjerano, 2010). Self-regulation is not easy and needs to be learned and supported with pedagogical tools (Järvelä, Kirschner, Panadero, Malmberg et al., 2015). Recent research suggests that learner motivation is not just an intrinsic characteristic of the learner but a, “complex interplay between individuals and the learning environment in which they are situated” (Hartnett, George & Dron, 2011, p. 31). Thus, the selection of teaching strategies plays an important role in activating and developing learner’s conative skills.

The following teaching strategies were included in the course to promote and support the development of learner’s conative skills: announcements, goal setting, planning tools, monitoring tools, choice and decision making, self-evaluation, self-reflection, peer review and access to a variety of open resources and support tools. How they supported participant learning is shown in Appendix 31.

It appears that the different types and range of resources assisted learners to proactively extend their existing knowledge. One person wrote:

Not only did I listen to the videos and read the readings but I also explored the links and researched further when I wanted to know more about a particular topic, tool or issue (Respondent 1-3, #36).

However, as can be seen in the comment below, some learners did not have the level of motivation required to receive the benefits of self-directed learning and, despite some evidence of exploration, still expected the “teacher” to provide most of the answers:

During the course, I often asked the question “How do you do what you do?” For example, how do make a YouTube video? How do you make a video where you can move your mouse around the screen to show things? I found the beginning of answers to some of my questions on Diigo and through my own internet searches, but I was wondering whether under your Quick links, you could have a practical “how to do” section (Respondent 1-3, #39).

Some people indicated that being given the freedom to choose which resources they accessed was beneficial to their learning. For example:

I thought the course provided a really good range of supporting readings, videos and other resources. Some of these were better / more useful than others but it was good being able to pick and choose (Respondent 7-3, #38).

The authentic task and timing of the course appeared to be a key motivator for some participants. In particular, participants in the 1st and 3rd iterations that were conducted during the summer break were motivated to complete the course so that they could implement their course outlines in the coming semester. One participant indicated that the timing of the course enabled them to create their unit plan, “ready for semester one” (Respondent 3-1, #38) and another advised:

I am writing an entirely new unit for this semester and this course helped me plan the unit (Respondent 1-3, #36).

The authentic task was another motivator for some participants:

I could see real world application of the tools, which was a motivator to continue (Respondent 3-3, #37).

However, another participant was not motivated to participate in some of the course activities, as she could not see how they would assist their learning:

I suppose the real problem was that I couldn't really see how these things were helping me, so perhaps the improvement needs to lie around making that connection clearer (but then that can't be easy either!) (Respondent 4-1 #39).

Conation is particularly difficult for online students and participating in the course enabled educators to experience online learning from a student perspective and ponder what they could do to support their own students:

I guess what is obvious to me is that ultimately I felt like a typical student - the focus very quickly became about completing the required task, and not about engaging with the deeper elements of my learning experience (reflecting, collaborating, supporting peers, etc). It truly raises the question for me as a teacher - if I find the conative aspects so difficult to sustain as a student, how can I sustain them in my own students? (Respondent 4-1, #40).

Despite their struggle with motivation, this participant acknowledged that they thought the authentic learning approach was a very engaging and effective learning model that they would use in their future courses:

At any rate I value the knowledge I gained about authentic learning, especially from the point of view that whatever my own struggles with motivation were, authentic learning makes the process so very much more meaningful and motivating than other approaches and I mean to put it firmly into practice where I can (Respondent 4-1, #40).

Technological affordances

Technological affordances are the, “properties of an object or medium that affect how they can be/are used, as well as how and if they are perceived and the relationships that exist between the properties and the use/user” (Järvelä, Kirschner, Panadero, Malmberg et al., 2015, p. 129). Technology selection plays a significant role in supporting authentic learning environments as the proliferation of freely available Web 2.0 applications offers educators creative opportunities for developing authentic hands-on tasks and connecting learners in meaningful ways (Lombardi, 2007b; McLoughlin, 2011).

The course evaluation survey included two statements related to the selection and use of technologies to support participant learning (see Table 31).

Table 31: Student perceptions - Technological affordances

Statement number	Statement (course evaluation survey)	Course iteration number & (Number of respondents)							
		1 st (5)		2 nd (3)		3 rd (7)		Total (15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
32	The technologies I was required to use in the course aided my learning	100%		100%		86%	14%	95%	5%
34	The technologies used in the course demonstrated some of the ways these tools could be used to assist student learning	80%	20%	34%	66%	57%	43%	57%	43%

Communication, collaboration and content sharing technologies were incorporated into the course to support participant learning and encourage interaction. Technologies included: Blogs, Diigo, Discussion forums, Google Drive, Skype chat, how to videos and Jing screencast tutorials.

Most participants agreed (95%) that the technologies they used in the course assisted their learning. One participant explained how the course technologies helped to support her learning through direct but also vicarious means:

The Google Docs helped me to complete the task because it enabled me to survey how other people were interpreting the task. Similarly, Skype kept me in touch with other participants and the conversations that were happening between other participants. By observing these conversations I was able to answer some of my own questions (Respondent 5-1, #37).

Others found the use of technologies to access relevant information and examples helpful:

[Technologies] linked to both polished, academic writing as well as 'down to earth', 'real world' experiences in layman's terms (Respondent 3-3, #37).

Despite these positive experiences, quite a few participants (43%) indicated that the course did not demonstrate how the technologies could be used to assist student learning. One person stated:

I found the blogging difficult as I struggled a bit with the purpose I would have found it easier if I were writing to the group only. I like to write for a particular audience and would have found it easier to engage if there was a group discussion page or something like that (Respondent 1-1, #37).

This comment is interesting because participants were advised that the purpose of the blog was to articulate and share their reflections about the readings and their learning throughout the course with their peers. It appears that this participant may have been more comfortable within the genre of a closed discussion forum rather than a public blogging site.

Another suggested that a specific activity for each of the group social tools might assist their understanding of how these tools can support student learning:

Despite my complaint about using a blog, Diigo, Google docs and skype above, I do see how important it is to be exposed to such technologies. I wonder if each of these could have been introduced with a brief, specific activity that both familiarised us with the technology and demonstrated its usefulness to our learning (Respondent 4-1, #39).

A comment in response to the course survey statement #37 suggests that lack of learner participation, and therefore lack of engagement, may be another reason that some people indicated the technologies did not support their learning:

I'm not sure they really did. However the fault in this instance lies with me as I didn't complete the second task in full. As this was the more digitally focused part of the course this would have been the most useful time to identify

appropriate technologies - and doubtless draw on those I had used!
(Respondent 7-3, #37).

These comments highlight not only the importance for learners to be able to move easily between the various technologies, but also the need for active participation on the part of the learners to fully understand the ways in which the technologies could support their learning.

A few participants experienced difficulties installing some of the open web technologies on their work computers due to strict university software installation policies. One person commented:

I found the technologies helpful. Some of the technologies I couldn't use because of administration rights on my computer but I would be keen to use them when I can (Respondent 2-1, #37).

However, most were able to find alternative solutions. For example, one participant reflected on her blog that she overcame the problem by installing the apps for these programs on her iPad:

After some confusion I have managed to complete the required tasks and install the necessary software. There was some difficulty loading some of the software onto my laptop, due I think to the strict SOE. However these difficulties were overcome by using an iPad (LH-3, Blog).

Other participants commented on how the course helped them to learn how to install and use new technologies as evidenced in the following response:

I had never personally blogged, but in this course I learned about blogs, installed WordPress, and began to learn the basics of how to use it. I reflected using this technology and responded to others who were also blogging (Respondent 1-3, #37).

Having the opportunity to use technology from a learner's perspective assisted participants to understand how the tools could be applied in their own teaching to support student learning. One participant said:

I feel like I'm trying new things and seeing application for them. What to use some of the technologies for has always been a problem for me but now I'm on the student side I'm starting to see uses (HS-1, Email).

Another commented on how her exposure to Diigo had triggered ideas for using it with her own students:

Social bookmarking sparked many ideas for me in regard to having students locate, engage with, share and discuss resources in their units (LD-1, Teaching survey).

Others commented on how engaging and fun discovering new technologies was:

I've been fossicking around the toolbox site this afternoon - it's absolutely brilliant - so many possibilities for my teachers to extend themselves (JF-2, Skype)

Whilst discovering how easy the technologies were to learn and use came as a surprise for others:

I have used Jing and Camtasia to make screencasts for external students showing them the online learning environment and how to engage with particular unit activities. I have been pleasantly surprised at how relatively easy this has been compared to the degree of difficulty I was expecting (CM-1, Blog).

The opportunity to use a range of technologies during the course helped participants to see, “real world applications of the tools” (Respondent 3-3, #37) and how some technologies they were already familiar with outside a learning environment could be used to support student learning. The following forum post demonstrates one participant’s thoughts about how Skype could be used to support student interaction:

I hadn’t considered using Skype in my course. I did incorporate real time discussions in my course, but used LMS. These had to be organised in advance. The spontaneous nature of Skype has that added advantage of being able to share an idea or question at the time you think of it, if anyone else is also on line. I also like the fact that you get an instant message to let you know a message has been posted (I always have my Skype on). I can see the scope to use the Skype forum for discussion of ideas and content, not just social chat. (HD-2, Forum).

Participants also found the Skype text chat a useful tool for seeking assistance when they were confused or struggling with a concept, “I am trying to come up with my learning scenario in the analysis worksheet and need a bit of help” (LD-1, Skype) as it, “enabled quick responses to questions by the facilitator and occasionally other students” (Respondent 2-2, #37).

It also supported reflection and articulation and one participant expressed her surprise at the affordance this technology offered to enable her to communicate with other group members in real-time, “I must say, this is amazing to all be on the chat together” (CM-1, Skype). The above comments indicate the Skype group chat was a useful technology for support teaching presence and social interaction.

Learners commonly feel overwhelmed by the abundance of information available on the Internet and often waste time trying to locate resources they have previously accessed. One participant commented on how Diigo helped her to organise her learning:

I have decided that I am going to make more use of Diigo to track sites I visit and things I need to get back to. This way I can refer to some information later and avoid the temptation to be distracted by interesting things and potentially lose hours (CM-1, Blog).

Having the opportunity to use Diigo in a learning situation enabled participants to understand how it could be used to support student learning:

I will suggest using Diigo, as a tool to academic staff, even though I have used it myself for a few years I had not considered using it with groups of students (RS-2, Prospective teaching survey).

Google Docs was also perceived as a valuable collaboration tool for, “sharing work and collaborating” (Respondent 3-2, #37). It was not only worthwhile from a student perspective, but also from a teaching perspective as educators recognised it could be a useful tool for working collaboratively with their colleagues:

I REALLY like Google docs (from what I can see of it) and I think this will be a great tool for me to use in the future as I work collaboratively with my on campus equivalent to write our Science Units (NG-2, Forum).

Another commented on how useful Diigo and Google Docs would be for file storage and version control:

I can see Diigo and Google docs will be useful as I tend to make endless copies of things so I can read them in various locations and end up with version confusion. If I can access them all from all my devices it will save me printing off so many and less confusion about which is the latest version (HS-1, Email).

It was evident that the course exposed participants to a range of new technologies and that they became more confident in using and experimenting with them to support student learning in their future teaching:

I will use lots more of the technology available. I will use wikis and blogs as I can now see their purpose. Videos are also now in my repertoire! I know what questions to ask and who to ask them of now (HS-1, Teaching survey).

The technologies used in the course to support student learning also encouraged participants to use them to provide teaching presence in their own courses. One participant commented on how useful the facilitator created screencasts were:

I think the screencasts are great for showing students how to participate online and I will continue to use these (CM-1, Teaching survey).

Another identified how she might use a combination of both open and closed web applications in her future teaching:

Jing – to teach students the way around the LMS as this is often cited as a concern by my online and even face-to-face students. Drop box – a useful way for students to work collaboratively on the production of an end product. Skype for real-time support and on-going support by students of each other and communication with me. LMS for virtual discussions and sharing of material produced as part of assessments and then to be discussed between students (HD-2, Teaching survey).

Overall, participants indicated the technologies selected for this study were engaging and supported their learning. The choice of technologies also exposed them to a range of tools for different elements of learning—in particular, collaboration, reflection and social interaction—and helped them to generate ideas about how they might use them in their own courses to support student learning and engagement.

Conclusion

The aim of the data analysis discussed in this chapter was to identify the ways in which the components of teaching presence facilitated the design and delivery of the authentic online professional development course for higher education professionals. All aspects of teaching presence contributed to supporting participant learning. In particular, access to a wide variety of resources and technologies helped learners to understand how open educational resources and the affordances of web technologies could be used in their own courses to support their students. It was also apparent that facilitator support played a major role in helping participants achieve their learning goals.

Findings: Sub-research question 1

In what ways do the components of social, cognitive, and teaching presence facilitate the design and delivery of authentic online courses within higher education?

Generally, participants felt real-world relevance, reflection, collaboration and integrated assessment were the most critical components for effective online learning. Access to multiple perspectives and a variety of resources, and producing polished end products were also deemed important.

Ill-defined, complex tasks completed over a period of time that could be applied across different subject areas and resulted in a diverse range of outcomes were seen as the least important elements. It appears participants interpreted *ill-defined* to mean badly defined, and *outcomes* as the learning outcomes identified for the course, which were the same for everyone, rather than the diverse range of end products (outcomes) they actually produced. Although some participants envisaged that having students complete the tasks over a sustained period of time would lead to more authentic learning, most did not comment on this aspect.

Participants also appreciated the opportunity to reflect and collaborate with their peers and enjoyed being able to access the vast array of resources on the web. In particular, they found that the specifically designed video mini-lectures and tutorials supported their learning and opened their eyes to new ways of using these technologies in their own courses.

The learning environment enabled participants to freely navigate among the various resources to access content and support when needed. It also encouraged them to take charge of their own learning and control what they learned and how they completed the tasks.

When working with a small cohort of students, it is difficult to achieve a high level of interaction. The findings suggest participants in the 1st iteration of the course achieved a reasonably high level of interaction. However, participants in the 2nd iteration experienced a relatively low level of interaction. It is unclear if the different communication technologies employed in each course had an impact on the level of interaction or whether the participant's personalities were a contributing factor. This is an area that requires further investigation.

This chapter discussed the analysis and findings associated with teaching presence and, together with Chapters 6 and 7, explained how the components of social, cognitive and teaching presence facilitated the design and implementation of the authentic online professional development courses for higher education academics. The next chapter will discuss the impact the course had on changing online educators' existing teaching practices.

Course impact analysis and findings

This chapter addresses sub-research question 2: How effective is an authentic community of learning framework in encouraging practitioners to implement new pedagogies and technologies within their own online courses? It discusses the potential impact the framework had on prospective future teaching practices, some of the online learning issues participants were hoping to resolve by undertaking the course and the effect the course had on changing participants' existing workplace practices.

Potential impact on future online teaching practices

The purpose of the online professional development course was to expose higher education practitioners to new pedagogical methods and technologies to assist them to create more interactive and engaging learning environments. A participant background survey (see Appendix 12) was conducted prior to the commencement of the course to provide a snapshot of participants' teaching practices before they commenced the course. A prospective teaching survey (see Appendix 153) was subsequently conducted at the conclusion of the course to capture information about participants' perceived future practices.

In particular, the questionnaires asked participants to indicate which authentic task elements and technologies they were already using in their online units at the time of course commencement and which elements and technologies they intended to use in their future online courses. An analysis and summary of their responses are provided in the following sections.

Comparison of authentic task elements

Herrington et al.'s (2010) elements of authentic tasks were used to analyse and classify participant responses from the background questionnaire and the prospective teaching questionnaire to identify participants' existing and potential future use of authentic tasks. Table 32 below shows the change in the participants' actual, and then projected, use of the elements of authentic tasks.

Table 32: Comparison of authentic task element responses (before and intended)
for all three iterations (19 responses)

Elements	Use before %	Intended use %
Real-world relevance	79%	95%
Reflect	68%	95%
Integrated assessment	47%	84%
Collaborate	60%	84%
Multiple perspectives & variety of resources	47%	79%
Polished products	31%	68%
Ill-defined tasks	13%	63%
Complex task completed over a period of time	35%	58%
Applied across different subject areas	39%	53%
Diversity of outcomes	27%	47%
None of the above	13%	0%

It was interesting to note that the use of most of the elements (with the exception of *real-world relevance*) were higher in the course prospective teaching survey completed at the end of the course. This suggests the course was effective in encouraging participants who had not used these elements prior to undertaking the course to think about incorporating them in their future courses.

It was not surprising that those elements that scored more highly in the participant background survey, such as *real-world relevance* (79%), *collaboration* (60%), and *reflection* (68%), showed less variation in the intended use after the course. As many participants felt they were already using these elements in their courses, there may have been minimal scope for change. However, the percentages did increase across all of these elements, indicating that educators who had not previously used these elements would try to include real-world relevance, collaboration and reflection in their future teaching.

The prospective teaching questionnaires showed very few participants (13%) used *ill-defined complex tasks* in their own teaching before undertaking the course and while there was an increase (63%) in this element over the duration of the course, it was not as high as might be expected. This corresponds with the relative low rating respondents gave on the course survey when asked if they thought *the tasks were ill-defined and open to multiple interpretations* (#7).

The use of clearly articulated, step-by-step instructions has been a hallmark of the systems approach of instructional design (Gagné, Briggs, & Wagner, 1992). It appears that breaking

away from such a systematic linear learning design can be quite challenging for some educators. However, being immersed in this “messy” real-life approach—where participants were themselves required to define the sub-tasks and activities they needed to learn to complete the overall *ill-defined complex task*—prompted other participants to ponder whether their current teaching methods were possibly too structured and were hindering their students’ self-directed learning skills:

I tend to panic with lack of structure and I think I impose this on my students a bit too at times. Maybe I'm not giving them enough latitude to learn for themselves because I'm so worried it's all my responsibility? (HS-1, Blog)

The shift from contrived teacher-centered learning approaches to an authentic student-centered approach requires educators to give student more control over their learning so that they can discover, share and create meaningful knowledge. However, handing over control of the learning to students requires an ecological change in thinking about teaching and learning for many educators (Richardson, 2013).

The relatively low scores for *completing complex tasks over a sustained period of time* (35% & 58%), *applied across different subject areas* (39% & 53%) and *diversity of outcomes* (27% & 47%) suggests participants placed fairly low importance on these aspects of authentic tasks. *Completing tasks over a sustained period of time* and allowing for a *diversity of outcomes* in the end product are both closely aligned to the *ill-defined* nature of authentic tasks, as complex tasks commonly require more time for learners to complete and produce polished artefacts. It could also be possible that participants interpreted *diverse outcomes* as not achieving the intended learning objectives, rather than producing diverse and unique products that met the learning objectives.

Comparison of participants’ technology use

It was interesting to discover that the percentage of participants who used the LMS discussion forums before the course (42%) did not think they would use them as much in their future learning environments (26%) (see Table 33 below). There is no clear data to explain why this might be, although the substantial increase in participants’ expected future use of some of the other technologies used (e.g., Skype, Diigo and Google Docs) suggests that their exposure to a range of different forms of communication technologies may have had an impact. Instead, participants may have intended to try a wider variety of social media in their courses rather than relying predominantly on discussion forums.

Table 33: Comparison of technology use responses (before and intended)
for all three iterations (19 responses)

Technologies	Use before %	Intended use %
Online collaboration (e.g., Google Docs)	11%	47%
LMS blogs or Online Blogs	11%	42%
Social bookmarking (e.g., Diigo)	0%	32%
LMS discussion forums	42%	26%
Real-time chat (e.g., Skype)	0%	21%
LMS wikis	11%	21%
Social media (e.g., Facebook / Twitter)	11%	16%
Screencasts (e.g., Jing)	0%	16%
File sharing (e.g., Dropbox)	5%	16%
Website creation (e.g., teacher or student created)	5%	11%
LMS recorded lectures (e.g., LCS, Camtasia)	11%	11%
Audio response (e.g., Soapbox)	0%	5%
Virtual conference tools (e.g., Collaborate)	16%	5%
LMS chat	11%	5%
LMS (e.g., Moodle, Blackboard)	5%	5%
Online polls / surveys (e.g., Survey Monkey)	5%	5%
LMS assignment submission	5%	0%
Online videos (e.g., YouTube, facilitator created)	26%	0%
LMS quizzes	11%	0%
Online brainstorming (e.g., Answer garden)	5%	0%

While 26% of participants responded that they used YouTube or facilitator-created videos before they undertook the course, no one indicated that they would use them in the future. This was an unexpected finding as quite a few participants commented on how useful they found the personalised videos created by the facilitator. Perhaps they misinterpreted it as just using existing YouTube and not facilitated created videos. One person in the 1st iteration of the course blogged about how they would create and use videos in an upcoming course:

We are both going to make welcome videos as well as our usual written 'announcement' and instead of just writing a discussion question, we're going to make a short video posing the questions for the group to discuss - we hope this will get them more engaged in the discussion. For another assessment we're going to get students to make a 3-minute video presentation of an allocated case study (HS-1, Blog).

There was a noteworthy increase in participants' expected future use of social web technologies (such as, Google Docs, Dropbox, Diigo and Skype), particularly for those who

had not used these technologies before. It appears immersing participants in a technology rich environment where they used technology as cognitive tools, rather than simple information delivery tools, assisted them to understand the different types of learning associated with using technology:

Taking this course was like jumping into the deep end of a pool and having to stay afloat. From the beginning, I had to use the technological tools (Moodle, Wordpress for blogs, Google Doc, Videos, Diigo, Skype, the Internet etc.) to engage with the content as well as to complete the assignments. There were two types of learning occurring. For some technologies I was learning how to use the technology in the first instance. Through using the different technologies, I actively engaged in the content of the course. I learned about blogs, installed Wordpress and began to learn the basics of how to use it (Respondent 1-3, #37).

Some participants from all iterations of the course indicated they would implement strategies and/or technologies that they learned about during the course in their future teaching. Following is just one example of how a participant was already starting to implement their learning in the workplace:

I have two new units to write for this semester and 2 old units to revise (it's a heavy semester) and all of them are being reconceived in the online authentic learning paradigm. I feel that I have begun a new learning journey. (NA-3, Email).

As described in Chapters 6 and 7, a few participants indicated that they were dissatisfied with some components of the social and cognitive aspects of the course. However, despite the issues some learners encountered, *all* participants agreed the course was a useful professional development opportunity that assisted them in designing more interactive and engaging courses (see Table 34 below).

Table 34: Student perceptions of the overall course

Statement Number	Statement (course evaluation survey)	# Course iteration number & (Number of respondents)							
		# 1 (No. 5)		# 2 (No. 3)		# 3 (No. 7)		Total (No. 15)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
35	Overall I thought the course was a useful professional development opportunity	100%		100%		100%		100%	

The following comments illustrate the *Authentic eDesign course* was not only effective in facilitating participant learning, but also helpful with providing ideas about how they could make their own courses more engaging:

Without doubt, this has been a huge learning journey, which I have been able to engage with at my own pace. This in turn allows time for reflection, making mistakes (!), exploration, problem solving and imagination. This experience has been a huge eye-opener as to the possibilities for more engaging, motivating and authentic learning experiences for students (CM-1, Blog).

The course was both taster and teaser. It was a taster in that it introduced me to effective online teaching through the eyes of a student. It was a teaser in that it has opened a whole new world of authentic learning and technology to explore (Respondent 1-3, #40).

These comments indicate a strong pattern of self-reported change, and intention to change pedagogical practice, as a result of the course. The transfer of learning and impact on teaching practices is discussed later in this chapter.

Online learning issues and potential solutions

In the background questionnaire completed prior to the commencement of the course participants were asked to identify any particular issues they would like to resolve in the course. At the conclusion of the course, the prospective teaching questionnaire then asked participants if the course helped to resolve any of the issues they had identified before the course.

Table 35 identifies the online learning issues participants identified prior to commencing the course and their comments at the end of the course describing how they were able to resolve or partially resolve their issues as a result of participating in the course.

Table 35: Pre-course online learning issues and resolution comments

Issue (background questionnaire)	Participant comments and resolution status (prospective teaching questionnaire)
Creating activities for students to find their own information	Having used wikis and blogs throughout the course I can now see how they can be applied for online learning. I was not aware of ease of use and usefulness of collaborative tools previously or software for storing references that can be accessed from anywhere (HS-1: resolved).
How to make learning personally meaningful to motivate and engage students	I think authentic learning is a key weapon in my arsenal to overcome some of that resistance and lack of motivation. Knowing how to make it authentic, meaningful, purposeful and extremely relevant is key to what I am regularly trying to do with staff taking on professional development AND with staff trying to make their own teaching more effective (LD-1: resolved).
	I think that setting up my units using the principles which I have learning on the eDesign course has the potential to facilitate greater student engagement (NA-3: resolved).
	I didn't have any issues but the course really demonstrated well how you can create authentic learning environments and tasks in the online environment! (SA-3: Resolved).
	I have a bit more clarity on what is needed to make a learning task authentic but I am still struggling with the idea of 'handing over control' -the authentic ill-defined tasks that require students to define them. I will need more help from experienced teachers to guide my understanding and give ideas. I can see how important it is for the students - the whole idea of self-discovery being the most powerful form of learning, but I do not have concrete ideas on how to phrase the task or what prompts to give students to achieve the outcomes. hmmm...I guess that is where it starts. Thank you for the opportunity. Just by writing I have been reflecting (VT-3, partly resolved).
Designing authentic assessments	I have some ideas now about how to add assessments into tasks to make them seem less like assessments (RS-1: Resolved).
	If the assessments are relevant and the activities strongly related to the learning activities I believe this will improve my future units (HD-2: Resolved).
Developing technical skills	I am more confident but still working on this (HD-2: Partly-resolved).
How to encourage student participation and interaction	Using collaborative activities and good discussion options will help this (HD-2: Resolved).
	I got some good ideas and am keen to see how they work (AC-1: Partly-resolved).
Students lack of Internet skills and easy access to the Internet	This will be an ongoing problem for some students. I can help but giving step-by-step instructions for some activities and provide video introductions (NA-3: Partly-resolved).
Online students lack of people skills	This will be an ongoing issue which can be partially addressed through the use of Skype (NA-3: Partly-resolved).

Some issues identified by participants before the course were not able to be resolved, primarily because they were outside the scope of the study. Below is a summary of some of the issues identified *before* undertaking the course that participants indicated they were not able to resolve:

- Time-management and time consumption issues for staff (LD-1), checking discussion boards (CM-1), online teaching increased workload (NA-3)
- Keeping students engaged throughout the unit (i.e., keep them logging on to the unit website and using the resources) (BG-1)
- Effectively assessing online learning (BG-1)
- How to motivate F2F teachers to embrace online learning (Faculty professional development).

Participants indicated that ongoing professional development opportunities targeted at these specific issues would assist them to further develop their online learning knowledge and skills. These areas could be explored in future iterations of the course by creating new modules to address specific topics, such as implementation issues and effective online assessments.

Transfer of learning and impact on existing teaching practices

In addition to the data collected from the questionnaires and the blogs, three participants were selected for in-depth interviews to determine the impact the course had on participants' actual online teaching practices in the workplace. Face-to-face interviews were conducted with selected participants approximately six months after their completion of the course. People were purposefully selected for interviews based on the following criteria: 1) they had signed the ethics agreement letter, 2) they had completed the course, 3) they were teachers that designed and delivered online units for higher education students, 4) they had indicated on their prospective teaching questionnaire that they intended to implement strategies or technologies derived from the course in their future online courses and 5) they advised (during a follow-up phone call) that they had implemented ideas from the course and were available for an interview.

As noted in Chapter 3, face-to-face interviews were recorded and transcribed. A semi-structured interview method was used to ensure the relevant themes were discussed and to allow interviewees to express new ideas during the interview. Transcriptions were sent to the three interviewees and they confirmed the vignettes were an accurate description of their teaching situations.

All participants interviewed confirmed they did in fact incorporate more elements of authentic learning and new technologies into their own courses as a result of participating in the *Authentic eDesign course*. The following vignettes describe the elements the three participants implemented in their courses and how pedagogical change was realised.

Vignette: Helen (HS-1)

Prior to commencing the *Authentic eDesign course*, some of the learning strategies Helen employed in her online courses included, “mostly just reading materials, with reflective questions included within modules and some activities and review questions at the end of each”. Student assignments consisted mainly of, “case studies and other activities submitted to the teacher as a [hard copy] portfolio for part of the final assessment to make them worthwhile for students to do” (HS-1, Teaching questionnaire).

Since completing the course, Helen has now included a blogging activity to make an existing task more authentic and engaging. Instead of having students simply, “pick a topic from a list and write an essay” approach, she had her students read the newspaper each day to find real-life examples of the key employment relations issues they were studying. She used the LMS Wiki tool (so that students could see each other’s work) to create a blog page for each student where they could reflect and comment on newspaper articles about employment issues they found during the first few weeks of the course:

The point of getting them to do the news items was to try and whet their appetite for some topics rather than me saying, here’s a list of topics. I thought if they started reading news items and blogged about them that might get them a little bit interested. A couple of them said to me, I really enjoyed this activity. I can read the paper and feel like I’m actually doing my homework. So that was good (HS-1, Interview).

Helen also replaced a traditional individual case study analysis submission with a video presentation case study analysis that all students uploaded to their Wiki page. The student wiki pages were a learning e-portfolio where they could document their reflections about the issues they were studying, provide peer feedback and present their work to a broader audience (Jonassen, 2000). Previously, on-campus students facilitated their case study analysis during class and the online students simply submitted their hard copy analyses to the teacher. Using video technology also enabled the online students to obtain feedback from their peers about their analyses (Boase-Jelinik, Parker & Herrington, 2013; Keppell et al., 2006).

A practice activity, a one-minute introduction video, was included to introduce the task and to help students feel more comfortable using their selected technology. Two educators

facilitated the course and both facilitators created their own introduction videos to model the process and expected performance outcome. A few students experienced technical problems uploading their videos, however, these issues were addressed in the practice activity so there was less stress on students when they had to do the assessable video task:

It was good that it was just an introduction because we were able to get over those things and got comfortable with just saying, if you've got a problem just email it and we'll upload it at this end. That worked okay and most of the students embraced it fairly positively (HS-1, Interview).

Prior to commencing this course, Helen advised that the technologies she currently used in her courses were, "Blackboard discussion forums and one or two links to TV programs/YouTubes". She also indicated she would like to record her lectures on Camtasia but she did not, "have the time and not sure how/where to start" (HS-1, Teaching questionnaire) and that, "what to use some of the technologies for has always been a problem for me but now I'm on the student side I'm starting to see uses" (HS-1, Email).

She is also discovering new uses for technology for her own career development and thinks that having a purpose for using a new technology will give her the opportunity to practise and explore other ways it could be used:

I would quite like to have a play with creating my own e-portfolio where I could keep student feedback sheets and my case studies as I think it might be quite useful to start collecting information for the next promotion round. It would be good to have a practice with it, it would give me a reason to use it and if I started it off for that purpose I think I'd rapidly see other applications for it (HS-1, Interview).

Looking at the changes Helen has made to her teaching, it is evident that the *Authentic eDesign course* has assisted her in developing knowledge, skills, confidence and motivation to explore more authentic learning approaches, online pedagogies and new technologies (Lombardi, 2007b).

Vignette 2: Carolyn (CM-1)

Carolyn explained her ultimate aim for participating in the *Authentic eDesign course* was to glean ideas about how to better engage her external students. After completing the course, she implemented a number of new strategies in her own units. For two of her online units, she created screen casts to introduce herself and the unit to her students and emailed the link to all external students. She thought this worked really well as she received a few replies from students saying, "it's really great to actually see a face and have someone talk to you".

She also created and implemented an open “companion website” (similar to the companion website used to support the *Authentic eDesign course*) using Google sites for both units. She stated, “I found it really quite easy to do once I got the hang of it”. She found creating her own companion website gave her the flexibility to sequence the learning activities and web links together, which she was not able to do within the universities LMS. This made it easier for her students to navigate through the course and access relevant information as needed. She advised, “I had really good feedback from the students, they loved it. It was so easy to navigate, you just had to click and it’s all there”.

Carolyn also introduced the use of a wiki in a postgraduate unit to encourage more collaboration amongst her students. On the wiki, students could respond to focus questions, add comments and design their own questions that others might want to talk about. She found that students who were comfortable with technology had their wiki page up and running relatively quickly and were able to ‘fly’ with it. For example, one student actually filmed herself and articulated what she was thinking about when she was doing the reading and embedded her video on the wiki. Others embedded YouTube movies and links to other resources and shared their learning with their peers. However, there were also many students who struggled with this technology due to lack of technical skills or their inability to access or contribute to the site—defence personnel, for example, are not permitted to have a public presence on the open web.

Despite the difficulties some students encountered, Carolyn felt this strategy was reasonably successful. Although, she did have some concerns about the motivational perspective and how she could manage the environment so that highly motivated students are not demotivated by others lack of participation, and that less confident or skilled students were not intimidated by the high performers. This is something she felt she would need to consider before using the wiki again in future courses. Carolyn also thought students who lacked technical skills spent more energy trying to figure out how to use the technology rather than focusing on the learning. However, this concern may be resolved in the not too distant future as her university had implemented a compulsory technology unit for first year pre-service primary teachers that would also be extended to include students studying secondary education. Because of this new unit, she believed that her future students should be more confident using new technologies.

Carolyn advised that she did not need to re-design her learning and assessment tasks, as the existing tasks were already based on real-life situations that required students to use complex analytical and thinking skills. For example, in her second year unit students are required to write a philosophy of teaching and then show what it would look like in the

classroom. They create a lesson plan, then unpack their plan and provide a rationale for why they used particular activities and strategies.

She felt participating in the *Authentic eDesign course* increased her confidence with using new technologies and that the communication and collaboration strategies she implemented in her courses this year did encourage more student engagement than in previous years.

Vignette 3: Brad (BG-1)

Brad had already designed his first semester course prior to undertaking the *Authentic eDesign course*. He advised that prior to the course he had a number of informal conversations with the course facilitator that helped him shape the design of his course. However, the course was an opportunity for him to learn more and extend his existing knowledge.

In his course this semester, Brad created an authentic context and task for his students to complete. The authentic task required students to perform as a real-teacher would and create a website as a learning resource for their future media students. The website was the presentation space for students to upload resources, create activities, link to curriculum information and provide assessment descriptions. Brad felt that creating an authentic context and task worked very well. He explained that some students felt the task was “a little too onerous” and he indicated this was because he didn’t foresee how long it would take them to do it, nor that it could take many different directions. He thought if he ran the course again next year, he would refine the open-ended nature of the task and provide more guidelines to give students a sense of what is required for the end-product. Brad explained that some students, “were able to take their web sites into the classroom and use them and they want to keep on using them”. Overall, he felt that student feedback was positive and that he would “do it again next year and apply what I’ve learnt from this year to refine and improve the task and my examples”.

Brad introduced a Google Doc to enable students to share their work and obtain peer feedback for improving their work. He found students needed a lot of encouragement to use this technology and would introduce more scaffolding and guidance in future courses. He used an open Google Doc so that students would have access to each other’s websites after the course so they could stay connected.

Brad also created a couple of “how-to” screencast videos to support student learning. One video explained how to get started creating a website and another explained how to create a lesson plan in real-time. He explained that it required a bit of preparation on his part to get

used to the technology. However, he felt it was worthwhile as students did use the videos and their feedback about its value was “very positive”. The lesson planning video, in particular, enabled students to see the thinking processes that one goes through when planning a lesson for a high school English class. He explained, “as I was creating the lesson plan I was thinking aloud so the video enabled them to see what I was doing and to listen to my thoughts as I was creating it”.

Brad created a model website and included it in his course to give students some ideas about what to include and how they could use screen casting videos to support their own students. Although not a required component of the course, a number of students created their own video demonstrations for their websites. He also included the use of online slide share technologies, such as Slideshare and Authorstream, for student presentations. This enabled students to embed their presentations on their websites.

Initially, Brad was a little concerned about using the LMS and an open companion website, as he thought it might confuse his students navigating between the different resources. However, he thought the LMS was just too, “clunky, unsophisticated, visually unappealing and could not be personalised” so he kept the LMS use to a minimum and generally directed students to the open website where they could find most of the unit information and resources. He liked using a companion website as it provided the flexibility to arrange the course the way he wanted to present it. He stated, “I could embed videos, pictures and attachments and it was all very easy to do”.

Brad reflected that he didn’t know how useful the companion website would be to students after the course because it was structured around the unit and weekly topics. He thought for future courses it would be more useful to use a thematic structure based on key media themes so that students could, “dip in and out to access and read about the concepts related to a particular purpose”.

Brad also created Facebook pages and Twitter hash tags to interact and engage with his students. Throughout the courses he surveyed his students to try and determine which technologies they preferred. The survey results indicated most students did not use Twitter and that they preferred Facebook. When asked if they used Facebook only as an information feed, or whether they interacted with it, the response was 50/50. He said about half of his students responded regularly on Facebook. Based on this feedback he advised, “I wouldn’t use Twitter again but I would use the Facebook page. In fact I’ll keep the same Facebook pages”.

Engaging students remains a challenge for all learning environments, in particular for online learning. Brad explained he did not really engage much with his fellow learners via the blogs or discussion forums during the *Authentic eDesign course* and thought the major reason was time constraints:

You have to be in the space to get information or to communicate and I wasn't always in that space because I had other things to do, I was busy working and had to manage my time (BG-1, Interview).

He believed that using social media could help him to connect and build relationships with his students and, after completing this course, he learned that he needed to reveal some personal information to build credibility, which he has taken on board.

Participating in this course and discussions with the facilitator has extended Brad's existing knowledge of authentic learning and given him the confidence to experiment with new pedagogical strategies. Despite his initial concerns about using open web technologies, he is enjoying the affordances these technologies offer to create more flexible learning environments and is incorporating more open access resources.

It appears participating in the *Authentic eDesign course* enabled Brad to extend his existing online knowledge and to reflect on how he could further improve his online course for future iterations.

Findings for sub-research question 2

How effective is an authentic online learning framework in encouraging practitioners to implement new pedagogies and technologies within their own online courses?

Participants who completed the prospective teaching questionnaire at the end of the course indicated they were able to resolve, or mostly resolve, online learning issues they experienced before the course and many indicated that they would implement elements of the framework within their future online courses. The educators interviewed after the course confirmed that they effectively implement new pedagogies and technologies within their own online courses as a direct result of participating in this study. Thus, it appears the authentic online learning framework used to design the course, was an effective framework for changing participants existing teaching practices.

The following chapter discusses the overall research findings, the limitations of the study and suggested areas for future research.

Conclusion

This chapter begins with a summary of the research that involved the development, implementation and evaluation of a professional development course for higher education practitioners to help them create more interactive and engaging online learning experiences for their students. Then the findings of the study are discussed according to three types of outputs: knowledge, products and professional development. Following this, implications of the research, the limitations of the study and recommendations for further research are provided.

Overview of the study

A lack of engaging online learning is particularly evident within the higher education sector where learning management systems (LMS) are often used as information delivery vehicles rather than as environments that facilitate constructivist learning (Hodges & Repman, 2011; Lane, 2008; Weigel, 2005). A major challenge for instructional designers and practitioners when implementing authentic online learning is aligning the critical components of authentic tasks with effective learning principles (Herrington et al., 2010).

Studies have shown that quality staff development training prior to teaching online can result in improved teaching practices and a better learning experience for both the students and the teacher (Green, 2012; McQuiggan, 2012; Salmon, 2014). Furthermore, the practice of demonstrating theoretical principles by example has the potential to influence student learning through immersion. Using a bottom up approach to encourage practitioners to employ more authentic, interactive and engaging learning strategies in their own courses was identified as a potential solution for changing existing online teaching practices (Maor, 2003a; Oliver, 2005).

In the study reported in this thesis, an online course was developed to provide higher education practitioners with the opportunity to learn how to use an authentic online learning framework to assist them with addressing this challenge. The aim of the study was to determine if the practical application of the framework was an effective model for designing an online professional development course that would encourage educators to change their existing online teaching practices.

This study employed a design-based research approach to test the effectiveness of model. An overview of how the four phase design-based model was applied to this study is shown below in Figure 20.

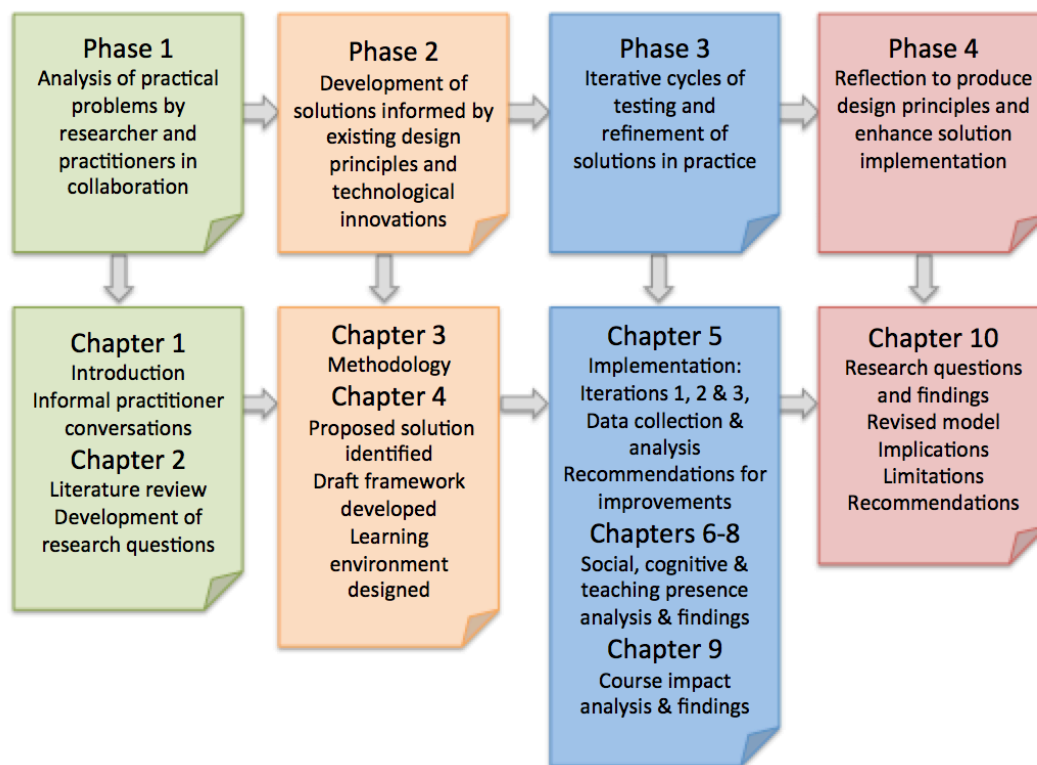


Figure 20: An overview of how the four phases of design-based research were applied to this study

The draft authentic online learning framework developed and employed for the design and delivery of the online professional development course is primarily based on principles of authentic learning (Herrington et al., 2010) and components of Garrison et al's (2001) Community of Inquiry (CoI) model. Data collected during the first implementation was used to refine two further iterations of the course. The draft framework was modified to produce a practical model that educators could use to design and implement authentic online communities of learning in their future teaching.

The culmination of this work identified six learning design principles that can be used as guidelines to assist educators to design more interactive, engaging and effective e-learning environments in higher education. These design principles are discussed in the following section.

Findings of the study

McKenney, Nieveen and van den Akker (2006) argue that design-based research has the potential to produce three substantial outputs: design principles (scientific outputs), designed products (societal outputs) and professional development (tertiary outputs). The findings of this study have been summarised under these three outputs and are discussed in the following sections.

Design principles

The draft *authentic online learning framework* provided a solid foundation for designing and implementing the online course. However, during the study it became apparent that minor modifications to the framework could be incorporated to improve the participants' understanding of how to apply the framework. The final model, shown in Figure 21, was named the *authentic online community of learning (AoCoL) model* to highlight the importance of developing an online community of learning to support student interaction and engagement.

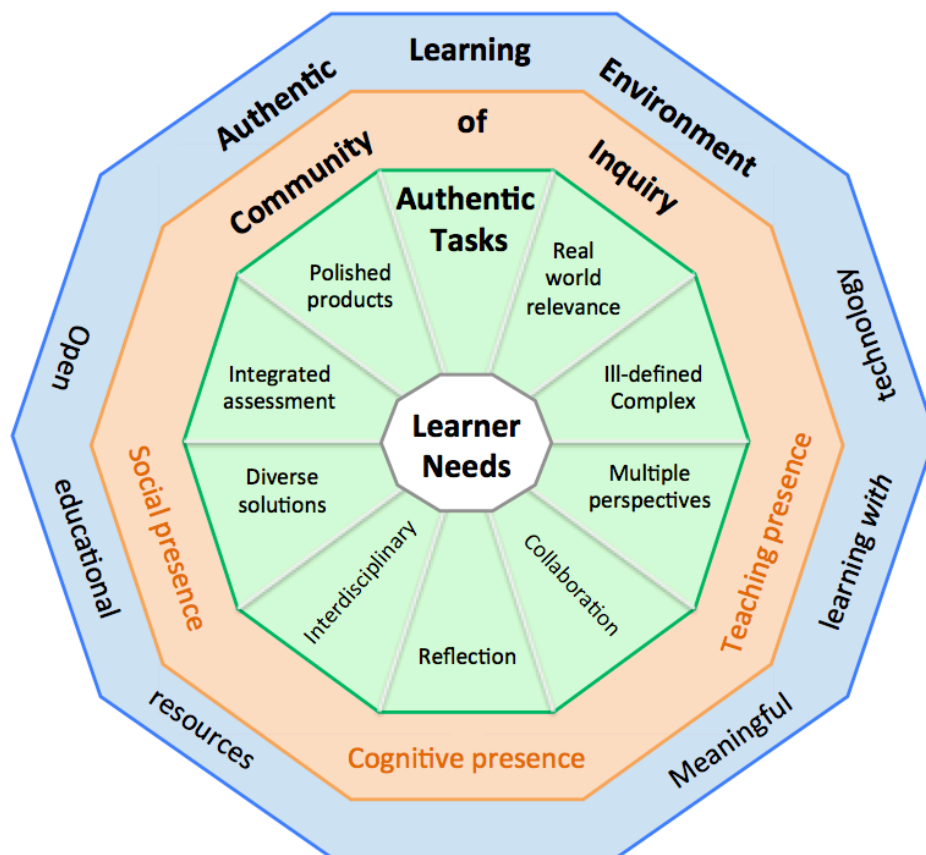


Figure 21: Authentic online community of learning (AoCoL) model

The original circular design has been replaced with a hexagon design to illustrate the multi-faceted nature of each of the components in the framework. Each of the components are layered to indicate how each subsequent layer contributes to and supports the inner layers. Working from the middle outwards can help educators analyse and design their course. The central component is concerned with identifying the *learning outcomes* that students will be required to demonstrate by the end of the course. The learning outcomes guide the development of an *authentic task* that students can complete to demonstrate achievement of the intended learning outcomes. Once the task has been identified appropriate resources and supports can then be selected to help develop and maintain social, cognitive and teaching presence. Finally, educators need to identify appropriate learning environments (or platforms) that will facilitate the delivery of authentic learning, meaningful learning with technology and the use of open educational resources.

The five original principles have been revised and refined as six principles to more clearly articulate the key areas educators need to consider to create authentic, interactive and engaging online learning experiences. The six principles for designing an *authentic online community of learning (AoCoL)* that emerged from the study and are evident in the model include:

- *Learner needs*: Provide opportunities for students to develop and demonstrate higher-level learning outcomes
- *Authentic tasks*: Create authentic tasks and assessments that reflect real-work/life situations
- *Community of Inquiry (CoI)*: Select social, cognitive and teaching pedagogies, technologies and other resources to support student learning
- *Authentic learning environment*: Develop an environment that embraces the principles of authentic learning
- *Meaningful learning with technology*: Incorporate technologies that can assist learners with meaningful cognitive engagement and social interaction
- *Open educational resources*: Provide access to a variety of open educational resources to extend learners existing knowledge and skills.

The above design principles are not intended to be a *recipe for success* but rather, a guide to assist others to select and apply the most relevant insights to their own contexts (McKenney et al., 2006). Table 36 lists each of the principles (together with principal proponents) and identifies guiding questions and suggestions for how the principles could be instantiated in a learning environment.

Table 36: Authentic online community of learning design principles, meaning prompts and instantiation suggestions

No.	Design principle	Guiding questions	How the principle could be instantiated in the learning environment
1	Learner needs: Provide opportunities for student's to develop and demonstrate higher-level learning outcomes (Partnership for 21st Century Skills, n.d.).	What is the goal of the course? Who is the target audience? What attitudes, skills and knowledge will students ideally have by the end of the course?	Describe the course goal and aims. Articulate who would benefit from taking the course and identify any prerequisites. Write clear and effective learning objectives to identify the relevant learning outcomes that students will be required to demonstrate.
2	Authentic tasks: Create authentic tasks and assessments that reflect real-work/life situations (Herrington et al., 2010).	What kind of activities are conducted in the real world that use the knowledge, skills and attitudes that are the focus of the course?	Create challenging real-life tasks that would be performed in real world situations or workplaces. Use elements of authentic tasks to guide the development and check the authenticity of the task(s).
3	Community of Inquiry: Select online social, cognitive and teaching pedagogies, technologies and other resources to support student learning (Garrison et al., 2000).	What pedagogical strategies could you employ to support social, cognitive and teaching presence? What technologies could you use to support social, cognitive, and teaching presence?	Social presence: Promote a safe & trusting environment by providing netiquette rules and encouraging open communication & self-expression. Social presence: Encourage learners to interact with each other and discuss their thoughts, ideas & learning experiences. Cognitive presence: Encourage reflection & collaborative construction of knowledge. Teaching presence: Provide coaching & scaffolding to model process and expected standard of completed products. Teaching presence: Promote conation by fostering self-regulation, identifying learners' interests, and encouraging intellectual curiosity.

No.	Design principle	Guiding questions	How the principle could be instantiated in the learning environment
4	Authentic learning environment: Develop an environment that embraces the principles of authentic learning (Herrington et al., 2010).	What context might be possible and appropriate in an e-learning course to enable students to learn the knowledge, skills and attitudes of the course? What type of learning spaces would be most suitable for the authentic environment?	Identify a real-world context that could be undertaken in an online environment. Use elements of authentic learning to guide the design of the environment.
5	Meaningful learning with technology: Incorporate technologies that can assist learners with meaningful cognitive and social interaction (D. Jonassen et al., 2008).	What technologies could learners use to demonstrate their knowledge and skills and produce polished finished products? What technologies could teachers use to facilitate learner communication and collaboration?	Select technologies that students can use as cognitive tools to create meaningful end products. Include communication & collaboration tools to support social & cognitive presence. Encourage learners to take advantage of the affordances of web technologies.
6	Open educational resources: Provide access to a variety of open educational resources to extend learners existing knowledge and skills (Hylan, 2006).	What information and materials will teachers need to provide to assist students to understand the concepts and complete the tasks? What resources could be accessed from open public websites? What resources need to be accommodated in a secure protected environment?	Provide access to a variety of open educational resources that students will be able to access after the course. Include a range of resources that provide students with multiple perspectives about the concepts and tasks.

Designed products

The dominant goal of design-based research is designing, developing and improving the quality of educational products or programs (Herrington, McKenney, Reeves & Oliver, 2007). The major output of this study was a professional development course that was created for higher education professionals to assist them to discover pedagogical strategies and technologies to support student learning in an online environment. The draft authentic online learning framework was used to guide the design and implementation of the course. Three iterations of the course were implemented and evaluated to improve the quality of the course design and to fine-tune the draft principles (McKenney et al., 2006).

Barab and Squire (2004) believe that, “design-based research that advances theory but does not demonstrate the value of the design in creating an impact on learning in the local context of the study has not adequately justified the value of the theory” (p. 6). As described in the previous chapter, this study revealed that the designed product—the *Authentic eDesign course*—did justify the value of theory by having a positive impact in encouraging educators to use more authentic, interactive and engaging strategies in their online courses.

In addition, a range of open educational learning materials and resources were developed to support this study (see Appendix 30) and licensed under Creative Common licenses so that they may also be of benefit to the wider educational community. For example, the *Technology Toolbox for Educators* website was initially created as a resource to enable participants to access relevant teaching resources after the course was finished. However, since its inception, it has also been used by other educators and hundreds of university students studying to be primary or secondary school teachers (cf. Herrington, Parker & Boase-Jelinek, 2013).

Professional development

An additional benefit of design-based research is that collaboration with practitioners in the field to test and refine the effectiveness of the proposed framework and guiding principles usually results in enhanced professional development for all involved in the study (Herrington, McKenney et al., 2007). This study provided the opportunity for practitioners in the field to experience online learning theories in action. They were able to experience authentic online learning from a student perspective and reflect on the strategies used from a teaching perspective. They obtained first-hand knowledge about how the facilitator designed the course and took away strategies and ideas to implement in their own teaching. They participated in reflection and discussion activities and created polished meaningful end products they could use in their workplaces. The study also enabled educators, teacher development staff and learning designers to contribute their ideas for refining the draft framework. It is expected that the model will continue to evolve as more practitioners implement it within their teaching areas.

One of the purposes of design-based research is to disseminate information to the broader educational community to inform both theory and practice. Appendix 32 includes a number of papers that have already been disseminated to date through conferences, journals (with peer review) and through education networks and wikis.

Research questions and findings

Chapters 6-8 discussed the research findings related to social presence, cognitive presence and teaching presence. The findings from these three aspects of the study assisted the researcher to answer sub-research question 1:

In what ways do the components of social, cognitive, and teaching presence facilitate the design and delivery of authentic online courses within higher education?

The findings discussed in Chapter 6, indicate that the key elements of social presence— affective, interactive and cohesive communication—contribute to the development of a safe and friendly learning environment where learners feel comfortable connecting, communicating and collaborating with their peers. Thus, selecting activities and technologies that help to support social communication and collaboration can assist in the development of a community of learning.

The findings of the study presented in Chapter 7, confirm that selecting a meaningful real-life task that challenges and engages learners is critical for developing cognitive engagement. The task enables learners to acquire the skills and knowledge to demonstrate achievement of the intended learning outcomes. Including opportunities for learners to collaboratively construct knowledge, use technologies as cognitive tools, access a variety of open educational resources and share their thoughts and ideas about the course content can assist them to assimilate new information and construct personal meaning and mutual understanding.

The study found that teaching presence (see Chapter 8) played a major role in supporting participant learning. The design of the learning environment, course management, facilitator support, coaching/scaffolding, and the selection of learning materials, resources and supports, all contributed to participant success in the online environment. Thus, social, cognitive and teaching presences are essential elements for creating an effective authentic online learning experience.

The impact analysis findings discussed in Chapter 9 provided evidence to enable the researcher to answer sub-research question 2:

How effective is an authentic online learning framework in encouraging practitioners to implement new pedagogies and technologies within their own online courses?

The study revealed that the majority of participants who completed the course (or completed most of the tasks) did implement strategies and ideas that they had learned into their own teaching. This suggests that the *authentic online community of learning* framework was an effective model for encouraging practitioners to consider new ways of teaching and learning in their online courses.

The culmination of the findings discussed in Chapters 5 - 9 assisted the researcher to answer the overarching research question:

Can immersing higher education practitioners in an authentic learning environment assist them to create more interactive and engaging online learning experiences within a learning management system?

The study found that immersing educators in the environment they are learning about does have the potential to change their existing teaching practices. As such, it appears that the framework was a successful model for empowering educators to embrace new pedagogical approaches and technologies, and to design more relevant and engaging online courses for students. The following comment is just one example of how this authentic learning approach has changed an educator's view of online learning and teaching:

I have won a teaching excellence award and a citation and so I think I can say that I am a good teacher. However, this course has revolutionised the way I think about teaching and learning. I will never approach teaching and the online environment in the way that I did prior to the course. I am equipped with new questions to ask, criteria against which to measure my units, technologies to use and explore and a model of what can be possible in the online environment. My horizon has been widened and I feel that I have made a paradigm shift as an educator (Respondent 1-3, #40).

The findings indicate the *authentic online community of learning framework* provided crucial links between theory and practice. The results of this study and the accompanying guidelines may provide both practical and scientific contributions to existing knowledge for designing, developing and implementing sustainable online authentic learning within a learning management system.

Implications of the research

One of the principal implications of the research is that the *authentic online community of learning framework* can effectively inform the design and implementation of online learning environments. However, no one size fits all, and so instructional designers, lecturers and students must judge the applicability of the findings and recommendations to suit their own

learning situations. Factors practitioners should consider include learner needs along with design and implementation issues. These factors are discussed in the following section.

Implication for practitioners

The study revealed that the *authentic online community of learning* framework is a robust model that practitioners can use for designing and implementing more interactive and engaging online learning opportunities for their students. The framework includes guidelines and examples to help educators identify appropriate learning outcomes, authentic tasks and learning resources and supports to help learners achieve the intended learning outcomes. It provides guidelines for facilitating the social (affective skills), cognitive (cognitive skills) and teaching aspects of online learning. The framework also proposes guidelines for using open educational resources that can benefit both educators and students. Educators can reduce development time by using high quality educational resources readily available on the Internet to provide students with a broader and more authentic perspective of the learning concepts.

Implications for professional development personnel

Weaver et al. (2008) suggest successful institution-wide professional development requires three critical components: “full and open support of the institution; delivery by supportive staff with recognised expertise and credibility in online teaching; and a flexible and varied professional development program” (p. 772).

The study identified that lack of time due to high workloads and little or no recognition for improving teaching practice continue to hamper professional development enrolments and retention. If universities wish to improve the quality of existing online courses they need to implement policies at an administrative level to support more flexible professional development opportunities.

Participants in the study indicated that many higher education development programs are run by a dedicated teaching and learning unit that is primarily focused on the delivery of instructional interventions, such as how to use specific learning management systems. According to Weaver et al. the ideal person for delivering PD in higher education would be an “academic developer” who would be viewed as a trusted colleague and associate, rather than a perceived institutional change agent (2008). This research revealed limited evidence of programs aimed at helping educators to develop skills and knowledge about online pedagogical strategies or how different technologies could be used to support student learning. This suggests that universities need to employ people with academic expertise in online pedagogical strategies to be able to provide relevant and credible online training.

Too often faculty-training “is one-dimensional focusing on only one aspect, either technical or pedagogical skills” (Morrison, 2012, para. 14). In addition, online professional development is often provided as self-paced modules with limited interaction opportunities among learners and/or teachers. The study highlighted the importance of teaching presence in particular, for effective online learning. Universities could consider offering more flexible online learning options that would enable educators to develop online pedagogical and technological strategies and skills to support student learning. The principles and guiding questions that emerged from this study provide a robust model and a successful alternative to models frequently used to develop professional online learning.

Limitations of the study

The findings of this study provide strong support for using an *authentic online community of learning* framework to foster critical skills for effective learning. However, some aspects of the study may have influenced the research in such a way as to reduce confidence in some of the findings:

Participants self-selected to study the course

Because of self-selection, most participants already had a “positive mindset” towards adopting new pedagogical and technological learning strategies. The very positive response from participants in the study to break away from traditional “transmission” modes of teaching and embrace more interactive learning methods may be related to their existing desire for change. For this approach to have a large scale impact on existing teaching practices, institutions need to look at ways of encouraging practitioners who continue to use less effective teaching methods, that are possibly no longer suitable for today’s fast-paced global economy, to explore new ways of teaching.

The high drop out rate across the course

There was a relatively high drop out rate across all iterations of the course, which is not uncommon for online courses. The findings indicate high workloads and limited institutional support for attending professional development are two key factors affecting dropout rates. Offering incentives for staff to attend PD activities could increase enrolment and retention numbers. Research also indicates that some people withdraw from online courses at the point when they have obtained sufficient information to meet their immediate needs (Zheng et al., 2014). This suggests that online courses could offer a range of exit points to provide learners with the flexibility to obtain the professional learning they need and no more. One way to accomplish this would be to offer a series of online professional development modules

based on an authentic online community of learning framework that could be offered over an extended period of time, allowing each educator to select and study specific modules to suit their needs.

Neither of these limitations impact on the *authentic online community of learning framework* as an appropriate model for designing and delivering effective online learning. However, the limitations do indicate scope for further research, which are discussed in the following section.

Recommendations for future research

Design-based research is a systematic approach that encompasses a range of interdependent elements rather than isolated variables. This study provided the opportunity to study in-depth a small number of students as they were immersed in the learning environment and has illuminated the following potential areas for further research:

- The impact the choice of pedagogy and technology plays on supporting social, cognitive, and teaching presence
- How elements of authentic learning could be applied to a broader range of teaching contexts and sectors
- How learner ownership of social media sites might impact social and cognitive presence
- How the *authentic online community of learning framework* could be applied across different teaching areas to provide more flexible online learning opportunities within higher education.

These recommended areas for further research are just an indication of the research needed for educators to begin to understand the processes that students use as they learn in online environments, and the impact of the theoretical frameworks and models used to design and deliver effective online learning.

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Appendices

Appendix 1:

Characteristics of information courses

Referred to in Chapter 2: Literature review on page 8.

Characteristics of information courses

Adapted from Miller (2000)

Characteristics of Information Courses	Description
Teachers generate content and decide what is appropriate for learners to know.	Teachers generate information when they develop new courses. They select content to meet the learning objectives. They identify appropriate models, provide theoretical frameworks and write content based on their research -these are creative, generative processes. It is their styles of information generation that often distinguish one teacher from another. Successful teachers are creative teachers.
Teachers gather specific resources that are relevant to the content area.	Central to information courses is the process of gathering information. Teachers gather primary and secondary information from a variety of sources. Traditional modes of gathering include researching textbooks, industry interviews and observational studies. Today's methods of gathering include the additional methods of online research. Successful teachers are efficient gatherers.
Teachers group the information into weekly portions or modules.	George A. Miller (1956) called it "chunking." It is easy to be overwhelmed by the data, by the gigabits of information that come our way each day. To learn from data, teachers organize, aggregate, process and summarise those data. Although teachers may not reduce data down to what Miller (1956) called "the magic number seven, plus or minus two" chunks of information, their grouping activities should yield a more manageable, more understandable organization of the data. Successful teachers group information in meaningful ways.
Teachers give the information to students, where 'delivery' is often the metaphor.	All types of courses involve information generating, gathering and grouping. However for information courses, generating, gathering and grouping are primary activities. Successful information courses provide long-term value to their students.

Appendix 2: 21st Century student outcomes

Referred to in Chapter 2: Literature review on page 11.

21st Century student outcomes

(Partnership for 21st Century Skills, 2010)

Theme	Literacies and skills
Core subjects (3R's) and 21 st century interdisciplinary themes	<ul style="list-style-type: none">• Global awareness, financial, economic and business entrepreneurial literacy• Civic literacy• Health literacy• Environment literacy
Learning and innovation skills (4C's)	<ul style="list-style-type: none">• Creativity and innovation• Critical thinking• Problem solving• Communication• Collaboration
Information, media and technology skills	<ul style="list-style-type: none">• Information literacy• Media literacy• ICT literacy
Life and career skills	<ul style="list-style-type: none">• Flexibility and adaptability• Initiative and self-direction• Social and cross-cultural skills• Productivity and accountability• Leadership and responsibility

Appendix 3:

Conative domain taxonomy

Referred to in Chapter 2: Literature review on page 11.

Conative domain levels, characteristics and sub-categories

(Snow, Corno, & Jackson, 1996)

Level	Characteristics	Sub-categories
1. Action controls	The ability to handle competing intentions and other distractions affecting attention processes and other goal related actions engaged in by individuals to manage available resources in timely and efficient ways.	Self-regulation controls <ul style="list-style-type: none"> • Attention and encoding control • Information-processing control • Motivation control • Emotion control • Environmental control Mindful effort <ul style="list-style-type: none"> • Effort investment • Effort avoidance
2. Other directed orientation	Being open to influence from others and using intentional behaviours to influence others.	Self-concept, self-worth, self-efficacy, locus of control, social ability, empathy
3. Personal styles	Individual characteristic differences in volition. A person's preferred ways to adapt to the demands and affordances of situations involving cognitive or social performance.	Cognitive styles, learning style, expressive styles, response styles, defensive styles, cognitive controls

Appendix 4:

Meta-outcomes for higher order learning

Referred to in Chapter 2: Literature review on page 11.

Meta-outcomes for higher order learning

(Reeves, 2006, p. 299)

Meta-outcomes for higher order learning
Accessing and using information
Communication skills using multiple media
Demonstrating understanding accompanied by deep reflection
Applying rules and procedures to structured and unstructured problems
Being creative
Thinking critically
Making sound judgments
Problem solving
Being committed to life-long learning
Exhibiting intellectual curiosity
Proactively seeking to extend knowledge in one's discipline
Exhibiting ethical behavior

Appendix 5:

Deeper learning principles

Referred to in Chapter 2: Literature review on page 12.

Deeper learning principles

(Carmean & Haefner, 2002, p. 29)

Learning is	When
Social	<ul style="list-style-type: none">• It involves cognitive apprenticeship• It promotes reciprocity and cooperation among students• It offers prompt feedback• It encourages contact between students and faculty• It emphasizes rich, time feedback
Active	<ul style="list-style-type: none">• It is engaged in solving real-world problems• It is intertwined in judgement and exploration• It is situated in action• It uses active learning techniques• Practice and reinforcement are emphasized• Involvement in real-world tasks is emphasized
Contextual	<ul style="list-style-type: none">• New knowledge builds on the learner's existing knowledge• New knowledge is integrated into the learner's world• Knowledge is applied by the learner• New knowledge is demonstrated to the learner• Students have a deep foundation of factual knowledge• There is awareness that students come to the classroom with preconceptions about how the world works• Students understand facts and ideas in the context of a contextual framework• Learning is concrete rather than abstract
Engaging	<ul style="list-style-type: none">• It respects diverse talents and ways of learning• It communicates high expectations• It is done in high-challenge, low-threat environments• It emphasizes intrinsic motivators and natural curiosities
Student-Owned	<ul style="list-style-type: none">• Students organize knowledge in ways that facilitate retrieval and application• Students take control of their own learning: noting failures, planning ahead, apportioning time and memory to tasks• It emphasizes time on tasks• It emphasizes learner independence and choice• It allows time for reflection• It emphasizes high-order thinking (synthesis and reflection)

Appendix 6: **Elements of authentic tasks**

Referred to in Chapter 2: Literature review on page 14.

Elements of authentic tasks and descriptions

(Herrington, 2006, p. 4)

Authentic activities	Description
Have real-world relevance	Activities match as nearly as possible the real-world tasks of professional in practice rather than decontextualized or classroom-based tasks.
Are ill-defined, requiring students to define the tasks sub-tasks needed to complete the activity.	Problems inherent in the activities are ill defined and open to multiple interpretations rather than easily solved by the application of existing algorithms. Learners must identify their own unique tasks and subtasks in order to complete the major task.
Comprise complex tasks to be investigated by students over a sustained period of time	Activities are completed in days, weeks, and months rather than minutes or hours, requiring significant investment of time and intellectual resources.
Provide the opportunity for students to examine the task from different perspectives, using a variety of resources	The task affords learners the opportunity to examine the problem from a variety of theoretical and practical perspectives, rather than a single perspective that learners must imitate to be successful. The use of a variety of resources rather than a limited number of preselected references requires students to detect relevant from irrelevant information.
Provide the opportunity to collaborate	Collaboration is integral to the task, both within the course and the real world, rather than achievable by an individual learner.
Provide the opportunity to reflect	Activities need to enable learners to make choices and reflect on their learning both individually and socially.
Can be integrated and applied across different subject areas and lean beyond domain-specific outcomes	Activities encourage interdisciplinary perspectives and enable diverse roles of expertise rather than a single well-defined field or domain.
Are seamlessly integrated with assessment	Assessment of activities is seamlessly integrated with the major task in a manner that reflects real world assessment, rather than separate artificial assessment removed from the nature of the task.
Create polished products valuable in their own right rather than as preparation for something else	Activities culminate in the creation of a whole product rather than an exercise or sub step in preparation for something else.
Allow competing solutions and a diversity of outcomes	Activities allow a range of diversity of outcomes open to multiple solutions of an original nature, rather than a single correct response obtained by the application of rules and procedures.

Appendix 7:

Three categories of social communication

Referred to in Chapter 2: Literature review on page 28.

Three categories of communication responses and indicators of social presence

(Rourke, Anderson, Garrison & Archer, 1999)

Category	Indicators of social presence
Affective responses	Expression of emotions
	Use of humour
	Self-disclosure
Interactive responses	Continuing a thread
	Quoting from others' messages
	Referring explicitly to others' messages
	Asking questions
	Complimenting, expressing appreciation
	Expressing agreement
Cohesive responses	Vocatives
	Address or refers to the group using inclusive pronouns
	Phatics, salutations

Appendix 8:

Four phase model of critical thinking

Referred to in Chapter 2: Literature review on page 29.

Four phase model of critical thinking

(Garrison, Anderson, & Archer, 2001)

Phase	Description
Triggering event	Identification of a problem or task. Initiation of critical inquiry. An issue, dilemma or problem is identified.
Exploration	Exploration of relevant information. Participants shift from the between the private reflective world of the individual and the social exploration of ideas.
Integration	Making sense of and integrating ideas. Constructing meaning from ideas generated in the previous phase. Students move repeatedly back and forth from reflection to discourse.
Resolution	Testing plausible solutions. Taking direct or vicarious action to resolve the issue or problem posed. Implementing the proposed solution or testing the hypothesis by practical means.

Appendix 9:

Strategies for promoting and supporting e-presence

Referred to in Chapter 2: Literature review on page 29.

Strategies for promoting social presence

Strategies for promoting social presence may include:
Developing welcome messages
Including student profiles
Structuring collaborative activities
Incorporating audio and visuals
Using technologies to create social spaces where learners can interact and communicate in different ways

(Aragon, 2003; Jonassen, Howland, Marra, & Crismond, 2008)

Teaching strategies for supporting social presence

Teaching strategies for supporting social presence may include:
Frequently contributing to discussion boards
Promptly answering email
Providing frequent personalised feedback
Striking up a social conversation
Sharing personal stories and experiences
Using humour to reduce social distance, and convey goodwill
Using emoticons to help convey nonverbal cues
Addressing students by name
Allowing students options for how they address the instructor

(Aragon, 2003)

Strategies for promoting cognitive presence

Strategies for promoting cognitive presence may include:
Creating authentic meaningful tasks that challenge learners and encourage mindful engagement with the concepts and content to be learned
Encouraging reflection and articulation of both content and the students own learning processes
Providing opportunities for collaborative construction of knowledge
Providing access to a wide variety of resources and supports
Creating authentic assessments so that students can produce realistic polished products that could be used outside the learning environment
Using technologies to support student cognitive development, rather than simply using them to convey information

(Herrington, Reeves, & Oliver, 2010; Jonassen, 1994;
Partnership for 21st Century Skills, 2010; Schank, 2011)

Teaching strategies for supporting cognitive presence

Strategies	Source
Setting goals and monitoring performance	(Winograd & Smith, 1987)
Regulating the amount of content to be covered	(Arbaugh & Hwang, 2005)
Providing advice on how to get started	(Tung, 2007)
Explaining the relevance of the course content	(Garrison, 1992)
Fostering rapport between learners and teacher	(Granitz, Koernig, & Harich, 2009)
Modelling interaction and active engagement	(Sheridan & Kelly, 2010)
Moderating discussions	(Arbaugh & Hwang, 2005)
Encouraging collaboration	(Penick & Bonnstetter, 1993)
Providing individualised feedback on progress and assignments	(Brinthaupt et al., 2011)
Helping students develop self-regulated learning skills by giving them choices about what they learn	(Huitt & Cain, 2005)

Appendix 10:

Community of Inquiry (CoI) researchers and publications

Referred to in Chapter 2: Literature review on page 31.

CoI researchers and publications (259 articles)

CoI Model (126 articles)

- Akyol, Z. & Garrison, D.R. (2008). The development of a community of inquiry over time in an online course: Understanding the progression and integration of social, cognitive and teaching presence. *Journal of Asynchronous Learning Network*, 12 (2-3).
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- Arbaugh, J. B., & Hornik, S. (2001). Do Chickering and Gamson's seven principles also apply to online MBAs? *The Journal of Educators Online*, 3(2).
- Arbaugh, J. B., & Rau, B. (2007). A study of disciplinary, structural, and behavioral effects on course outcomes in online MBA courses. *Journal of Innovative Education*, 5(1), 65-95.
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Appendix 11:

Integrated evaluation framework

Referred to in Chapter 3: Methodology on page 41.

Integrated evaluation framework

(Reeves & Hedberg, 2003, pp. 56-64)

Evaluation functions	Development functions	Overall purpose	Primary questions and data sources
Review	Project conceptualization	Ensure team members are as well informed as possible about the primary options for interactive learning related to the project during its earliest stages of conceptualization.	What have others done? Review of professional literature and review of existing interactive learning interventions.
Needs Assessment	Design	Identify the critical needs that the proposed intervention is intended to meet.	What does the intervention need to do? Task analysis, job analysis, and learner analysis.
Formative Evaluation	Development	Provide information to guide decisions about creating, debugging and enhancing the intervention at various stages of its development.	What improvements can be made to the intervention? Expert review, user observations, and usability testing.
Effectiveness Evaluation	Implementation	Determine whether the intervention accomplishes its objectives within the immediate or short-term context of its implementation.	How effective is the intervention framework? Field tests, observations, interviews, and performance assessment.
Impact Evaluation	Institutionalization	Determine whether the knowledge, skills and attitudes learned in the context of instruction transfer to the intended context of use. Long-term context of practice on the job.	What influence did the intervention have on practice in the field? Document analysis, interviews, and observations.
Maintenance Evaluation	Project re-conceptualization	Examine the viability of the intervention over time.	Is the intervention sustainable? Document analysis, interviews, observations and automated data collection.

Appendix 12:

Participant background questionnaire

Referred to in Chapter 3: Methodology on page 41.

Referred to in Chapter 9: Course impact analysis on page 159.

Participant background questionnaire

Q#	Section 1 – Demographic information
Q1	Your name
Q2	Age range (18 – 22), (23 - 26), (27 - 32), (32+)
Q3	Student cohort: Select all that apply (University preparation), (Undergraduates), (Post graduates), Staff Development), (Other).
Q4	Years in teaching (Less than 1 year), (1 – 3 years), (3 – 5 years), (5 – 10 years) (10 years or more)
Q5	Why do you want to do this course? (short answer)
Q6	Have you designed and/or delivered an online course? (Yes), (No) Note: If no, type N/A for the following questions.
Q#	Section 2 – Course design
Q7	What learning strategies do you currently use in your online course?
Q8	<p>Select (tick) which of the following characteristics you use in your current courses (if any)? 10 elements of authentic tasks (Herrington et al, 2010):</p> <ul style="list-style-type: none"> • Authentic activities have real-world relevance • Authentic tasks are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity • Authentic activities comprise complex tasks to be investigated by students over a sustained period of time • Authentic activities provide the opportunity for students to examine the task from different perspectives, using a variety of resources • Authentic activities provide the opportunity to collaborate • Authentic activities provide the opportunity to reflect • Authentic activities can be integrated and applied across different subject areas and lean beyond domain-specific outcomes • Authentic activities are seamlessly integrated with assessment • Authentic activities create polished products valuable in their own right rather than as preparation for something else • Authentic activities allow competing solutions and a diversity of outcomes.
Q9	What technologies do you currently use in your online courses?
Q10	What issues have you encountered in designing and delivering online learning that you would like to resolve?

Appendix 13:

Prospective teaching questionnaire

Referred to in Chapter 3: Methodology on page 41.

Referred to in Chapter 9: Course impact analysis on page 159.

Prospective teaching questionnaire

Q#	Prospective teaching questionnaire
Q1	Your name
Q#	Please answer the following questions from the perspective of a teacher / trainer
Q2	What learning strategies do you think you might use in your online courses in the future? Why?
Q3	<p>Select (tick) the characteristics you think you might use in your future courses (if any)? 10 elements of authentic tasks (Herrington et al, 2010):</p> <ul style="list-style-type: none"> • Authentic activities have real-world relevance • Authentic tasks are ill-defined, requiring students to define the tasks and sub-tasks needed to complete the activity • Authentic activities comprise complex tasks to be investigated by students over a sustained period of time • Authentic activities provide the opportunity for students to examine the task from different perspectives, using a variety of resources • Authentic activities provide the opportunity to collaborate • Authentic activities provide the opportunity to reflect • Authentic activities can be integrated and applied across different subject areas and lean beyond domain-specific outcomes • Authentic activities are seamlessly integrated with assessment • Authentic activities create polished products valuable in their own right rather than as preparation for something else • Authentic activities allow competing solutions and a diversity of outcomes • None of the above.
Q4	Please explain why you would use the characteristics you selected in the previous question (Type N/S if you selected “none of the above” for the previous question.
Q5	What technologies do you think you might use in your own courses in the future (if any)? Why?
Q6	Did you resolve any of the issues you identified in the pre-course survey for designing and delivering online learning? (Refer back to your pre-course questionnaire). (Yes), (No)
Q7	If yes, How? If no, what support do you think you need to help resolve your issues?

Appendix 14:

Course evaluation questionnaire

Referred to in Chapter 3: Methodology on page 41.

Referred to in Chapter 5: Iterative cycles of implementation and testing of the learning solution
page 80.

Course evaluation questionnaire

N#	Likert scale statements
1	The course context represented the kind of setting where the skill or knowledge would be applied
2	The course environment provided a flexible pathway, where I was able to move around at will
3	The tasks mirrored the kind of activities performed in real-world applications
4	The task was presented as an overarching complex problem
5	The activities required significant investment of my time and intellectual resources
6	I was able to choose information from a variety of inputs, including relevant and irrelevant sources
7	The tasks were ill-defined and open to multiple interpretations
8	The tasks afforded the opportunity to examine the problem from a variety of theoretical and practical
9	I was required to take on diverse roles across different domains of knowledge in order to complete the tasks
10	Task assessment (evaluation) was seamlessly integrated with the major task in a manner that reflected real-world practices (not separate testing)
11	The tasks allowed a range and diversity of outcomes open to multiple solutions of an original nature
12	The learning environment provided access to expert skill and opinion
13	The learning environment allowed access to other learners at various stages of expertise
14	I was able to hear and share stories about professional practice
15	I was able to explore issues from different viewpoints
16	I was able to use the learning resources and materials for multiple purposes
17	I was provided with sufficient opportunities to collaborate (rather than simply cooperate) on tasks
18	I was provided with sufficient opportunities to reflect on the course content and my own learning
19	I was required to make decisions about how to complete the tasks
20	I was able to move freely in the environment and return to any element to act upon reflection
21	I was able to compare my thoughts and ideas to experts, teachers, guides and/or peers
22	I was able to work in collaborative groups that enabled discussion and social reflection
23	The tasks required me to discuss and articulate my beliefs and growing understanding
24	The environment provided collaborative group spaces and forums that enabled articulation of ideas
25	The environment enabled more knowledgeable learners to assist with coaching

N#	Likert scale statements
26	The facilitator provided contextual support and guidance
27	The facilitator provided timely and helpful feedback
28	The activities culminated in the creation of a polished product that would be acceptable in the workplace
29	The task enabled me to present my finished product (concepts & ideas) to a public audience
30	The activities allowed for multiple assessment (evaluation) measures
31	I felt comfortable learning in an open environment
32	The technologies I was required to use in the course aided my learning
33	The recommended readings were useful for learning about the concepts covered in the course
34	The technologies used in the course demonstrated some of the ways these tools could be used to assist student learning
35	Overall I thought the course was a useful professional development opportunity
N#	Short answer questions
36	What strategies did you use during this course
37	How did the technologies you used in this course support your learning?
38	What did you think were the strongest aspects of the course?
39	What areas do you think could be improved?
40	Any other comments?

Appendix 15:

Participant interview questions

Referred to in Chapter 3: Methodology on page 41.

Authentic eDesign interview guiding questions

Interview guiding questions	Prospective teaching survey questions	Responses to the prospective teaching survey questions
How did you design your online course as a result of your participation the <i>Authentic eDesign</i> course?	What learning strategies do you think you might use in your own courses in the future? Why?	
	Did you resolve any issues?	
What technologies did you use?	What technologies do you think you might use in your own courses in the future? (if any) Why?	
Did you include authentic options in your online course? If yes, what, if no, why?		
Any other comments you would like to make?		

Appendix 16:

Authentic online learning framework: Mapping of key concepts

Referred to in Chapter 4: Design of learning environment design on page 46.

Authentic online learning framework: Mapping of key concepts

CoI elements (Garrison, Anderson & Archer, 2000)	Authentic learning elements (Herrington, Reeves & Oliver, 2010)	21st century learning outcomes (Partnership 21 st century learning)	Learning with technology (Howland, Jonassen & Marra, 2012)	Using open educational resources (Hylén, 2006)
Social presence Engagement with participants Purposeful communication: <ul style="list-style-type: none"> • Emotional expression • Open communication • Cohesive expression 	<ul style="list-style-type: none"> • Articulation • Communication • Collaboration • Multiple roles & perspectives 	<ul style="list-style-type: none"> • Communication & collaboration • Social & cross cultural skills • Flexibility & adaptability • Civic literacy • Health literacy • Environmental literacy 	<ul style="list-style-type: none"> • Cooperative • Social mediums to support learning by conversing 	Tools <ul style="list-style-type: none"> • Online learning communities
Cognitive presence Engagement with content <ul style="list-style-type: none"> • Construction of meaning • Factual • Conceptual • Theoretical 	<ul style="list-style-type: none"> • Authentic context • Authentic tasks • Reflection • Collaborative construction of knowledge • Articulation of tacit knowledge • Authentic assessment 	<ul style="list-style-type: none"> • 3R's - Core subjects • Critical thinking & problem solving • Information, media, & IT literacy • Creativity & innovation • Initiative & self-direction • Leadership & responsibility • Productivity & accountability 	Constructive <ul style="list-style-type: none"> • Tools to support knowledge construction • Intellectual partners to support learning by reflecting Authentic/Active <ul style="list-style-type: none"> • Authentic context to support learning by doing 	Open learning content: <ul style="list-style-type: none"> • full courses content • modules • learning objects, collections & journals

CoI elements (Garrison, Anderson & Archer, 2000)	Authentic learning elements (Herrington, Reeves & Oliver, 2010)	21st century learning outcomes (Partnership 21 st century learning)	Learning with technology (Howland, Jonassen & Marra, 2012)	Using open educational resources (Hylén, 2006)
Teaching presence Engagement Re: Goals/ direction • Course design • Managing • Facilitating • Selecting content, resources & supports	<ul style="list-style-type: none">• Expert performances & modelling of processes• Scaffolding & coaching		Intentional <ul style="list-style-type: none">• Information vehicles for exploring knowledge to support learning by constructing	<ul style="list-style-type: none">• Tools: development software, content development tools, CMS & LMS• Implementation resources: publishing licences, design principles & localization of content

Appendix 17:

Mapping of elements for implementing effective online learning

Referred to in Chapter 4: Design of learning environment design on page 46.

Mapping of elements for implementing effective online learning

Guidelines for implementation of an authentic learning model (Herrington, 1997, pp. 72-74)	Guidelines for implementation (literature analysis 2000 – 2012)
Authentic context	
A physical environment which reflects the way the knowledge will ultimately be used (Brown, et al., 1989b; Collins, 1988; Young & McNeese, 1993).	<p>Real-life context (Carmean & Haefner, 2002; Grift, 2009; Johnson & Aragon, 2002; Koohang, Riley, & Smith, 2008)</p> <p>An introduction to set the stage or anchor the activity (Grant, 2002)</p> <p>Situated-learning environment (Berge, 2002)</p> <p>Access to technologies used in real-world settings (Green et al., 2010; Kim & Bonk, 2006; Kop, 2008; Levin-Goldberg, 2012)</p>
A design to preserve the complexity of the real-life setting with ‘rich situational affordances’ (Brown, et al., 1989b; Collins, 1988; Young & McNeese, 1993).	<p>Alignment of learning and performance context (Herrington et al., 2010; Thalheimer, 2010)</p> <p>Authentic or simulated learning contexts, the opportunity to practice skills needed in real-life projects (Helle, Tynjala, & Olkinuora, 2006)</p>
A large number of resources to enable sustained examination from a number of different perspectives (Spiro, et al., 1987; Young & McNeese, 1993; Brown, et al., 1989b; Collins, 1988).	<p>Access to a range of resources (Grant, 2002; Kop, 2008)</p> <p>Multiple methods of content exploration in various formats (Crawford-Ferre & Wiest, 2012; Green et al., 2010)</p>
An editorial policy which makes no attempt to fragment or simplify the environment (Honebein, et al., 1993; Spiro, et al., 1987; Young & McNeese, 1993; Brown, et al., 1989b).	
Authentic activities	
Activities which have real-world relevance (Jonassen, 1991b; Brown, et al., 1989b; Young, 1993; Winn, 1993; Resnick, 1987b; Cognition and Technology Group at Vanderbilt, 1990a).	<p>Mirror real-world work practices (Billett, 2002; Lombardi, 2007)</p> <p>Active learning involves students in authentic projects and problem-solving situations (Berge, 2002)</p> <p>Hands-on activities and useful learning tasks (Armstrong, 2012; Johnson & Aragon, 2002)</p>
Ill-defined activities (Young, 1993; Brown, et al., 1989b; Cognition and Technology Group at Vanderbilt, 1990a; Winn, 1993).	<p>Ill-structured meaningful problems (Green et al., 2010; Hmelo-Silver, 2004; Lombardi, 2007; Savery, 2006)</p> <p>Real-world problems and issues for students to resolve (Levin-Goldberg, 2012)</p> <p>A task, a problem or guiding question drives the learning (Grant, 2002, 2011; Helle et al., 2006; Splitter, 2009)</p>

Guidelines for implementation of an authentic learning model (Herrington, 1997, pp. 72-74)	Guidelines for implementation (literature analysis 2000 – 2012)
A single complex task to be investigated by students (Bransford, Vye, et al., 1990; Jonassen, 1991b; Cognition and Technology Group at Vanderbilt, 1990b).	A complex problem that does not have a single correct answer (Green et al., 2010; Hmelo-Silver, 2004)
An opportunity for students to define the tasks and sub-tasks required to complete the activity (Bransford, Vye et al., 1990; Young, 1993; Cognition and Technology Group at Vanderbilt, 1990b; Collins, et al., 1989; Collins, 1988).	Student controlled self-directed learning (Carmean & Haefner, 2002; Helle et al., 2006; Hmelo-Silver, 2004; Koohang et al., 2008; Pelz, 2004) Learning-centered environment (Berge, 2002) Exploration, higher-order thinking skills, learner's previous experiences, (Koohang et al., 2008; Splitter, 2009)
A sustained period of time for investigation (Bransford, Vye, et al., 1990; Cognition and Technology Group at Vanderbilt, 1990b).	Academically challenging activities that encourage sustained "time-on-task" (Kop, 2008; Kuh, Laird, & Umbach, 2004; Lombardi, 2007; National Survey of Student Engagement, 2010)
The opportunity for the detection of relevant versus. Irrelevant information, (Young, 1993; Cognition and Technology Group at Vanderbilt, 1990a).	Personally relevant or emotionally salient information (Splitter, 2009; Thalheimer, 2010)
the opportunity to collaborate (Young, 1993).	Collaborative learning activities (Green et al., 2010; National Survey of Student Engagement, 2011)
Tasks which can be integrated across subject areas (Jonassen, 1991b; Bransford, Vye, et al., 1990; Bransford, Sherwood, et al., 1990).	Conceptual interrelatedness and interdisciplinary learning (Koohang et al., 2008) Multifaceted tasks (Lombardi, 2007)
Access to expert performances and the modelling of processes	
Access to expert thinking and modelling processes (Collins, et al., 1989; Collins, 1988).	Access to subject-matter experts and/or external content specialists (Grant, 2002; Grift, 2009; Maor & Volet, 2007) Real world examples (Koohang et al., 2008)
Access to learners in various levels of expertise (Collins, et al., 1989).	access to modelling of performance by, co-workers, supervisors, guides, technical experts (Billett, 2002)
Opportunity for the sharing of narratives and stories (Brown, et al., 1989b; Brown & Duguid, 1993; Lave & Wenger, 1991).	Opportunities to discuss course content (Crawford-Ferre & Wiest, 2012; Green et al., 2010; Splitter, 2009)
Access to the social periphery or the observation of real-life episodes as they occur (Brown, et al., 1989b; Brown & Duguid, 1993; Lave & Wenger, 1991).	Access to real-life communities of practice (Kop, 2008) Involvement in real-life projects (Grift, 2009; Warner, Glissmeyer, & Gu, 2012)

Guidelines for implementation of an authentic learning model (Herrington, 1997, pp. 72-74)	Guidelines for implementation (literature analysis 2000 – 2012)
Multiple roles and perspectives	
Different perspectives on the topics from various points of view (Brown, et al., 1989b; Collins, et al., 1989; Cognition and Technology Group at Vanderbilt, 1990a; Cognition and Technology Group at Vanderbilt, 1993a; Lave & Wenger, 1991; Bransford, Sherwood, et al., 1990).	Address individual differences and experience problems from different perspectives (Johnson & Aragon, 2002; Lombardi, 2007) Respect diverse talents and ways of learning (Carmean & Haefner, 2002; Splitter, 2009)
The opportunity to express different points of view through collaboration (Honebein, et al., 1993).	Learner's multiple perspectives (Crawford-Ferre & Wiest, 2012; Green et al., 2010; Koohang et al., 2008)
The opportunity to criss-cross the learning environment by providing more than one investigation within a resource sufficiently rich to sustain repeated examination, (Spiro, et al., 1991a; Young, 1993; Spiro, et al., 1991b).	Integrate ideas or information from various sources, include discussion/articulation of diverse perspectives and amalgamate idea or concepts from across the curriculum (Kuh et al., 2004)
Collaborative construction of knowledge	
Tasks which are addressed to a group rather than an individual (Brown, et al., 1989b; Collins, et al., 1989; Young, 1993; Resnick, 1987b; Alessi, 1996; Maor & Taylor, 1995; Hooper, 1992).	Group collaboration and negotiation to collaboratively construct knowledge and solve problems (Green et al., 2010; Hmelo-Silver, 2004; Koohang et al., 2008; Lombardi, 2007) Collaborative learning, including teams and peer reviews (Grant, 2002; Kuh et al., 2004) Construction of knowledge through collaborative and individual activities, interaction with peers (Berge, 2002)open and flexible strategies for knowledge construction (Pan & Hawryszkiewicz, 2004)
Classroom organisation into pairs or small groups (Hooper, 1992; Fuller, 1996).	Interactive dialogues, student-student, student-faculty, student other (Carmean & Haefner, 2002; Green et al., 2010; Koohang et al., 2008; Kuh et al., 2004; Maor & Volet, 2007; Splitter, 2009; Stewart, Bachman, & Babb, 2009) Informal opportunities for open and honest conversations (Crawford-Ferre & Wiest, 2012) Community of inquiry – purposeful communication and interaction (Anderson, 2008; Anderson, Liam, Garrison, & Archer, 2001) Multiple services for collaborative learning (Pan & Hawryszkiewicz, 2004)
Appropriate incentive structure for whole group achievement (Hooper, 1992).	

Guidelines for implementation of an authentic learning model (Herrington, 1997, pp. 72-74)	Guidelines for implementation (literature analysis 2000 – 2012)
Reflection	
Authentic context and task (Brown, et al., 1989b; Norman, 1993).	Reflective evaluation of real-world projects (Warner et al., 2012)
The facility for students to return to any element of the program if desired, and to act upon reflection (Boud, et al., 1985; Kemmis, 1985; Collins & Brown, 1988).	Opportunities for reflection and transfer of learning (Berge, 2002; Grant, 2002; Hmelo-Silver, 2004; Johnson & Aragon, 2002) Self-reflection of knowledge gained (Crawford-Ferre & Wiest, 2012; Green et al., 2010; Hmelo-Silver, 2004; Koohang et al., 2008)
The opportunity for learners to compare themselves with experts (Collins, et al., 1991; Collins, 1988; Collins & Brown, 1988).	Reflection on own and others experiences (Berge, 2002) Reflection and self-assessment against milestones that are applicable for practitioners in real-world situations (Lombardi, 2007; Splitter, 2009)
The opportunity for learners to compare themselves with other learners in varying stages of accomplishment (Collins, et al., 1989).	An area for posting work for review, comment and use (Crawford-Ferre & Wiest, 2012; Splitter, 2009)
Collaborative groupings of students to enable reflection with aware attention (Knights, 1985; von Wright, 1992; Kemmis, 1985).	Questioning, observing and listening to others (Billett, 2002; Stewart et al., 2009) Reflective dialogue (Splitter, 2009) Construct and confirm meaning through sustained reflection and discourse (Anderson et al., 2001)
Articulation	
A complex task incorporating inherent, as opposed to constructed, opportunities to articulate (Edelson, et al., 1996; Collins, et al., 1989; Collins, 1988; Bransford, Sherwood, et al., 1990).	Synthesis and organisation of ideas, information or experiences into new more complex interpretations and relationships (Kuh et al., 2004; Splitter, 2009) Opportunities for learners to articulate progress on tasks (Armstrong, 2012)
Collaborative, groups to enable social then individual understanding (Vygotsky, 1978 ; Edelson, et al., 1996; Mercer, 1996)	Encourage interactivity to strive for social and cognitive presence (Anderson, 2008; Anderson et al., 2001; Pelz, 2004; Splitter, 2009)
Public presentation of argument to enable articulation and defence of learning (Pea, 1991; Lave & Wenger, 1991).	Enable knowledge to be applied by the learner (Carmean & Haefner, 2002; Hmelo-Silver, 2004) Learners' multiple representations of content, ideas and concepts (Koohang et al., 2008)

Guidelines for implementation of an authentic learning model (Herrington, 1997, pp. 72-74)	Guidelines for implementation (literature analysis 2000 – 2012)
Coaching and scaffolding	
A complex, open-ended learning environment (Collins, et al., 1989; Collins, 1988; Resnick, 1987b).	Context for content and assignments to support cultural differences (Crawford-Ferre & Wiest, 2012)
No attempt to provide intrinsic scaffolding and coaching (Reeves, 1993b; Collins & Brown, 1988; Wilson & Welsh, 1991; Dreyfus & Dreyfus, 1989; Greenfield, 1984). Note: specific to multimedia environments	Scaffolding to make learners think beyond what they already know (Koohang et al., 2008) Scaffolding, such as teacher conferences, computer-based questioning and project templates to help learners assess their progress (Grant, 2002) Effective scaffoldings to individual learning activities (Pan & Hawryszkiewicz, 2004)
Flexible suggestions and guidelines to address the needs of the teacher who may wish to optimise the use of resources in a variety of different contexts (Perkins, 1991b; Greenfield, 1984).	Technology selected should be compatible with varied student needs (Crawford-Ferre & Wiest, 2012) Students should have access to online orientation and FAQs (Crawford-Ferre & Wiest, 2012)
Collaborative learning, where more able partners can assist with scaffolding and coaching (Collins, et al., 1989; Collins, 1988; Young, 1993).	A safe and supportive campus environment (Crawford-Ferre & Wiest, 2012; National Survey of Student Engagement, 2011)
Recommendations that the teacher implementing the program is available for coaching and scaffolding assistance for a significant portion of the period of use (Harley, 1993; Collins, 1988; Griffin, 1995; Young, 1993).	Coaching and mentoring (Billett, 2002; Koohang et al., 2008) Regular mixed communication methods (Maor & Volet, 2007) Communication and feedback, including evaluation (Berge, 2002) Provide teaching presence to guide the learning process (Crawford-Ferre & Wiest, 2012; Kop, 2008; Pelz, 2004; Savery, 2006) Prompt feedback to students about mastery of techniques and principles (Armstrong, 2012; Koohang et al., 2008; Kuh et al., 2004) Facilitation and direction of cognitive and social processes to achieve learning outcomes (Anderson, 2008; Anderson et al., 2001)

Guidelines for implementation of an authentic learning model (Herrington, 1997, pp. 72-74)	Guidelines for implementation (literature analysis 2000 – 2012)
Authentic assessment of learning	
Fidelity of context (Meyer, 1992; Reeves & Okey, 1996; Wiggins, 1993).	Faithful representation of contexts (Wiggins, 2009) mastery as demonstrated by people who work with the knowledge (Splitter, 2009)
The opportunity for students to be effective performers with acquired knowledge, and to craft polished, performances or products (Wiggins, 1990; Wiggins, 1993; Wiggins, 1989).	Constructing concrete artefacts (Helle et al., 2006) Production of quality final products that affect the world beyond the classroom (Grift, 2009; Lombardi, 2007; Wiggins, 2009)
Significant student time and effort in collaboration with others (Linn, et al., 1991; Kroll, et al., 1992) .	Evolving continuing intellectual relationship with others to develop a group response (Green et al., 2010)
Complex, ill structured challenges that require judgement, and a full array of tasks (Wiggins, 1990; 1993; 1989; Linn, et al., 1991; Torrance, 1995).	Multiple forms of representation (Green et al., 2010; Helle et al., 2006) Non-routine and multistage real tasks/ problems (Wiggins, 2009)
The assessment to be seamlessly integrated with the activity (Reeves & Okey, 1996; Young, 1995).	Engaging and worthy tasks of importance (Grift, 2009; Wiggins, 2009) Assessment of performance and/or products (Armstrong, 2012)
Multiple indicators of learning (Lajoie, 1991; Linn, et al., 1991).	Production of one or more artefacts as representations of learning (Grant, 2002, 2011)
Validity and reliability with appropriate criteria for scoring varied products (Wiggins, 1990; Lajoie, 1991; Resnick & Resnick, 1992; Young, 1995; Hooper, 1992).	Individual assessment, team collaborative assessment and, facilitators assessment (Koohang et al., 2008; Stewart et al., 2009) Real-world tests of ability, transparent or demystified criteria and standards (Wiggins, 2009) Timely and focused evaluation of the learning (Pan & Hawryszkiewicz, 2004)

Appendix 18:

Authentic online learning draft design principles, meaning prompts and instantiation suggestions

Referred to in Chapter 4: Design of learning environment design on page s 49-50.

**Table Authentic online community of learning
draft design principles, meaning prompts and
instantiation suggestions**

#	Design principle	Guiding questions	Guidelines for course design
1	Learner needs: Clearly articulate the course goals, target audience, and learning objectives to help learners identify if the course is appropriate for them.	What is the goal of the course? (Phillips, McNaught, & Kennedy, 2012, p. 121). Who is the target audience? (Phillips et al., 2012, p. 121). What attitudes, skills and knowledge will students ideally have by the end of the course? (Herrington et al., 2010, p. 19).	Describe the course aims and goals. Articulate who would benefit from taking the course and identify any prerequisites. Write clear and effective learning objectives to identify the relevant 21st century learning outcomes that students will be required to demonstrate.
2	Authentic learning environment: Identify an authentic context and develop an environment that encourages transparency and sharing, and accommodates learner's privacy.	What context might be possible and appropriate in an e-learning course to enable students to learn the knowledge, skills and attitudes of the course? (Herrington et al., 2010, p. 19). What resources need to be accommodated in a secure protected environment? What public websites could be used to store content and provide open access to learning supports and resources?	Identify a real-world context that could be undertaken in an online environment. Use Herrington's elements of authentic learning to guide the design of the learning environment. Place private and confidential information and resources with a protected environment (e.g., a password protected LMS). Use open web platforms and social web tools to encourage transparency and sharing and access to course resources after the course has ended. Abide by copyright laws and institutional guidelines.
3	Authentic tasks: Create authentic tasks that enable learners to actively apply the attitudes, skills and knowledge to produce meaningful polished products as they would in real-work/life situations.	What kind of activities are conducted in the real world that use the knowledge, skills and attitudes that are the focus of the course? (Herrington et al., 2010, p. 22). What type of learning spaces would be most suitable for the authentic environment?	Create challenging real-life tasks that would be performed in real world situations or workplaces. Use Herrington's elements of authentic tasks to guide the development of and check the authenticity of authentic task(s).

#	Design principle	Guiding questions	Guidelines for course design
4	Learning resources: Provide access to a range of social, cognitive and teaching resources and take advantage of the affordances of new web technologies and open educational resources.	What information and materials will teachers need to provide to assist students to understand the concepts and complete the tasks? What resources will support student learning and assist them to produce polished finished products to demonstrate their knowledge and skills? What resources could teachers use to facilitate learner communication and collaboration?	Include conceptual and task resources to support student learning. Select technologies that students can use as cognitive tools to create meaningful end products. Include communication and collaboration tools to support social, cognitive and teaching presence. Provide access to a variety of open educational resources that students will be able to access after the course. Include a range of resources that provide students with multiple perspectives about the concepts and tasks.
5	Learning supports: Select pedagogical and technological supports to promote social, cognitive and teaching presence.	What pedagogical strategies could you employ to support social, cognitive and teaching presence? What technologies could you use to support social, cognitive and teaching presence?	Social presence: Promote a safe and trusting environment by providing netiquette rules and encouraging open communication and self-expression. Social presence: Encourage emotional express, open communication and group cohesion by having learners interact with each other and share their thoughts, ideas and learning experiences. Cognitive presence: Encourage reflection and collaborative construction of knowledge. Teaching presence: Provide coaching and scaffolding to model process and expected standard of completed products. Teaching presence: Promote conation by fostering self-regulation, identifying learners' interests (motivation), proactively extending their knowledge, and encouraging intellectual curiosity.

Appendix 19:

Technologies as cognitive tools

Referred to in Chapter 3: Methodology on page 53.

Technology roles and how they can be used as cognitive tools to support meaningful learning

(Jonassen, Howland, Marra & Crismond, 2008, pp. 7-8)

Technology role	How they can be used as cognitive tools
As tools to support knowledge construction	<ul style="list-style-type: none">• Representing learners' ideas, understandings and beliefs• Producing organized, multimedia knowledge bases by learners
As information vehicles for exploring knowledge to support learning by constructing	<ul style="list-style-type: none">• Accessing needed information• Comparing perspectives, beliefs, and worldviews
As authentic context to support learning by doing	<ul style="list-style-type: none">• Representing and simulating meaningful real-world problems, situations, and contexts• Representing beliefs, perspectives, arguments, and stories of others• Defining a safe, controllable problem space for student thinking
As social mediums to support learning by conversing	<ul style="list-style-type: none">• Collaborating with others• Discussing, arguing, and building consensus among members of a community• Supporting discourse among knowledge-building communities
As intellectual partners to support learning by reflecting	<ul style="list-style-type: none">• Helping learners to articulate and represent what they know• Reflecting on what they have learned and how they came to know it• Supporting learners' internal negotiations and meaning making• Constructing personal representations of meaning• Supporting mindful thinking

Appendix 20:

Course information and learning guide: Iteration 1

Referred to in Chapter 4: Design of learning environment design on pages 68, 72, and 79.

Referred to in Chapter 7: Cognitive presence analysis on page 132.

Authentic eDesign Course

Course Information & Learning Guide *January 2012*

Course Facilitator

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Introduction

Course overview

Welcome to *Authentic e-Learning Course Design*.

The focus of this course is learning how to design an online course based on authentic learning principles. The course is delivered fully online and is a FREE professional development opportunity for lecturers, teachers and/or tutors interested in learning how to apply an authentic learning framework to a new or existing online higher education course. The course is not intended to concentrate on technical matters of how to use particular computer systems but instead aims to provide an introduction to the use of real-life tasks where students use technologies as powerful cognitive tools for learning.

As you progress through the course you will complete an authentic task to redesign one of your existing online courses or an existing face-to-face course that you would like to put online using an authentic learning model supported by technology. During the course you will be given the opportunity to consider a variety of online pedagogies, explore a range of web-based technologies and experience online learning from a learners' perspective.

Prerequisites

To participate in the online course you need to read the research information letter and consent to participate in the research project by completing and returning the research project consent form to j.parker@murdoch.edu.au. A copy of the information letter and the consent form is available on [eLearn Open eCourses](#).

You need to be employed within the higher education sector and preferably have some experience designing and delivering face-to-face learning solutions. The course assumes no formal background in computing, however, we do assume that you are already familiar with your own computer system, as we are unable to provide detailed technical support or advice about particular configurations of computer hardware and software.

Course aims and objectives

Course aims

The main purpose of the course is to provide lecturers and tutors involved in creating online learning courses within higher education the opportunity to:

- Experience online learning from a student's perspective
- Learn how to use an authentic learning framework to design and implement their own courses
- Explore new technologies and
- Network with their peers

Learning objectives

On successful completion of the course you should be able to:

1. Analyse learning objectives to identify appropriate real-life learning contexts and tasks for a specific online course
2. Select appropriate technologies for students to use as cognitive tools to achieve specified learning objectives
3. Plan and design an effective online course using an authentic learning framework
4. Create a detailed course outline for an authentic online course
5. Evaluate an authentic online course outline and provide feedback for improving the proposed course

Course dates and time commitment

The authentic e-learning course design professional development course will commence Monday January 9, 2012 and run for four consecutive weeks. The course will open one week prior to commencement so you can familiarise yourself with the online environment. We expect you will need to dedicate a minimum of 3 hours per week to complete the course (total 12 hours).

Course access

To access the course you first need to agree to participate in the research project by completing and returning the research project consent form (copy on the [eLearn Open eCourses](#) site) to j.parker@murdoch.edu.au. Once we receive your consent form you will be enrolled in the course and sent a confirmation email with full details about how to access the [Authentic eLearning Course Design](#) online course.

eLearn Open eCourses is a Moodle virtual learning center. [Moodle](#) is a FREE easy to use web application that educators can use to create effective online learning sites. No previous Moodle experience is required for this course. Full instructions for navigating and accessing the course, course information, resources and supports will be provided.

If you have difficulties accessing the LMS, please contact the course facilitator. We suggest you spend some time early in the course exploring the learning opportunities and resources, so that you can use them efficiently later.

Resources & Supports

How to study this course

The course is task-based, so by completing the tasks, you complete the course. There are no lectures in this course. However, the LMS provides access to valuable online resources and services needed to complete the tasks.

The online support has several purposes:

- Facilitate participant-participant and participant-facilitator communication
- Provide access to a range of up-to-date and relevant resources and tutorials
- Provide you with direct, personal experience of online learning

We strongly advise you to familiarise yourself with the online environment prior to the commencement of the course, and to seek help early in case of any technical difficulties. Please be aware that the LMS allows the course facilitator to monitor the extent and nature of your participation in the LMS.

Study schedule

Because of the nature of the course tasks, you will work largely to your own schedule. However, the schedule below is a good indication of the weeks you might devote to the course activities, in order to complete the course tasks by the due dates.

Week	Activities	Tasks	Due Date
1.	Introduction to authentic learning Course overview Discussion topics – Introductions Setup online accounts & join groups Begin recommended readings		
2.	Analyse Task(s) <ul style="list-style-type: none">• Learning objectives• Workplace tasks• Learning context• Learning scenario Discussion topics – What is authentic learning? Continue recommended readings		
3.	Design Task(s) <ul style="list-style-type: none">• Tasks - description, details & deliverables• Resources & supports – task resources, task supports, & resource supports Discussion topics – Why use technology as cognitive tools rather than conveyors of information? Continue recommended readings	Draft course information learning guide (for peer review)	Sunday week 3
4.	Evaluate Task(s) <ul style="list-style-type: none">• Authentic learning checklist• Authentic tasks checklist	Final course information learning guide & video	Sunday week 4

Computing resources

You will need access to a computer and the Internet to study this course. In particular, you will need:

- PC or Mac computer (or access to one),
- Internet access
- Web camera and audio (or access to a computer with these facilities)
- A suite of software programs including word processing, spreadsheet and presentation program, such as Microsoft Office (Word, Excel, PowerPoint) or Apple iWork (Pages, Numbers, Keynote)

Course materials

Essential textbook - There is no compulsory textbook for this course.

Optional texts

There are a few excellent books that you might like to borrow or buy that can assist your learning in this course.

Herrington, J., Reeves, T.C., & Oliver, R. (2010). *A guide to authentic e-learning*. New York: Routledge.

Jonassen, D., Howland, J., Marra, R.M., & Crismond, D. (2008). *Meaningful learning with technology*. (3rd ed). New Jersey: Pearson Prentice Hall.

Phillips, R., McNaught, C., & Kennedy, G. (2011). *Evaluating e-learning: Guiding research and practice*. New York: Routledge.

Recommended readings

Anderson, T. (Ed.). (2008). *The theory and practice of online learning* (2nd ed.). Edmonton: AU Press. Retrieved 01/11/2011 from:

<http://www.aupress.ca/index.php/books/120146#>

Churches, A. (2009). *Bloom's Digital Taxonomy* [v3.01 pdf]. Retrieved 13/12/2011 from:

<http://edorigami.wikispaces.com/file/view/bloom%27s+Digital+taxonomy+v3.01.pdf>

Jonassen, D.H. (1994). *Technology as cognitive tools: Learners as designers*. ITForum. Retrieved 16/07/2011 from:

<http://it.coe.uga.edu/itforum/paper1/paper1.html>

Herrington, J., & Kervin, L. (2007). *Authentic learning supported by technology: Ten suggestions and cases of integration in classrooms*. Educational Media International, 44(3), 219-236. Retrieved 16/07/2011 from:

http://murdoch.academia.edu/JanHerrington/Papers/93056/Authentic_learning_supported_by_technology_10_suggestions_and_cases_of_%20integration_in_classrooms

Online resources

Parker, J. (2011). *Authentic e-Learning Course Design* [online course] Accessible at: <http://www.elearnopen.info/courses/course/view.php?id=15>

Assessment

There is no formal assessment component for this course. However, you will receive feedback from the facilitator and your peers with suggestions for improving the authentic e-learning course outline you will produce during this course.

Assignment Task

Plan an authentic online course for your area of teaching in higher education, create a detailed course outline and present an overview of the course to your colleagues.

Context

Imagine your university has asked you to convert an existing online or classroom course in your area of teaching to an online course based on authentic learning principles where students use new technologies as powerful cognitive tools to learn and demonstrate their achievement of the learning objectives. You are not that familiar with online learning design and new technologies so you have enrolled in an online professional development (PD) course to experience online learning from a student's perspective, to learn about authentic learning principles, online pedagogies and new technologies and to network with other online higher education lecturers, tutors and course designers.

Specific requirements

You need to:

1. Create a personal blog to record your reflections about your learning during the online PD course
2. Explore online communication and collaboration technologies by creating accounts and joining the following groups: Skype, Diigo and Google Docs.
3. Research authentic learning principles
4. Analyse your course requirements
 - o Articulate your learning objectives as measurable outcomes
 - o Identify a real-life learning context for your course task(s)
 - o Identify appropriate resources and supports for student learning
5. Develop a written learning and assessment course outline for your online course and publish it as an online document so your colleagues can access it to review and provide feedback
6. Review a colleague's authentic course outline and provide them with feedback for suggested improvements
7. Modify your course outline (if desired) based on feedback provided
8. Record a 5 minute video presentation to describe your course to your colleagues and publish it to a video sharing website
9. Invite your colleagues to view your video presentation

Support resources

There are a number of support resources available on the LMS that will assist you with your learning and help you complete the above assignment task:

- Suggested technologies for creating blogs, publishing online documents, sharing online videos etc.
- Blog guidelines and guiding questions
- instructions on how to join specific online communication and collaboration groups created for this course (e.g., Skype, Diigo and Google Docs)
- discussion forums where you can ask questions and share your ideas with your peers
- course analysis activity sheet
- example authentic e-learning course outlines created by other educators
- example pedagogies and technologies
- links to recommended readings and online articles
- authentic learning checklists and peer evaluation tools
- presentation tips, suggested technologies and tutorials

Preparing your online course outline

Clearly introduce your area of teaching and identify your target audience. Produce a polished word processed course outline (eg: Word or Pages) with headings to clearly identify the relevant sections. Save it as a pdf file and upload it to an online document sharing website.

Preparing your video presentation

Ensure you clearly introduce yourself, your course, and the course student cohort. Provide an overview of the learning context, the tasks students will complete and the key learning resources and supports. Your introduction should include video footage of yourself and the body should include images and links to relevant resources to support the verbal information you provide. Abide by copyright laws and acknowledge all third party resources and information using in-text citations and add a final slide listing all your references (APA 6th style) so that your colleagues can follow up your sources.

Assignment submission

Follow the instructions provided on the LMS to submit the URL's for your online course outline (pdf file), video presentation and personal blog.

Appendix 21:

Learning resources and supports categorised by the Col elements

Referred to in Chapter 4: Design of learning environment design on page 64.

Learning resources and supports categorised by the Col elements

Col category	Learning resources	Learning supports
Social presence <i>Engagement with participants</i> <ul style="list-style-type: none"> Emotional expression Open communication Group cohesion 	<ul style="list-style-type: none"> Moodle profile video Introduction forum General forum Skype group chat Links to blog tools & information 	<ul style="list-style-type: none"> Example profile Forum instructions Netiquette guidelines Skype video tutorial & written instructions Blog guidelines Example blog
Cognitive presence <i>Engagement with content</i> <ul style="list-style-type: none"> Reflection Articulation Collaboration Problem solving Critical thinking 	<ul style="list-style-type: none"> Task discussion forums Google Drive folder Diigo library Video lectures Analysis worksheet Authentic learning checklist Peer review evaluation sheet Links to online articles & information 	<ul style="list-style-type: none"> Task instructions Diigo & Google Drive video tutorials & written instructions Example finished task products Example online learning pedagogies & technologies Prompt questions for reflecting on readings
Teaching presence <i>Engagement re: Goals/direction</i> <ul style="list-style-type: none"> Designing the course Managing learning Facilitating learning Including expert performances Modelling of processes Promoting conation Selecting materials and resources Providing access to technological affordances 	<ul style="list-style-type: none"> Welcome email Course information & learning guide Study schedule LMS navigation video Examples of finished products Facilitator created Just-in-time screencasts to model processes and respond to specific student inquiries Access to a wide variety of open educational resources 	<ul style="list-style-type: none"> Announcements Active involvement in discussion forums Monitoring learning & progress Feedback on finished products Encouragement to continue striving to finish the course Inclusion of a range of technologies and access to tutorials

Appendix 22:

Course analysis template

Referred to in Chapter 4: Design of learning environment design on page 66.

Course analysis template

Analysis based on guiding questions developed by Herrington, J., Reeves, T.C., & Oliver, R. (2010). *A guide to authentic e-learning* and Phillips, R., McNaught, C., & Kennedy, G. (2012). *Evaluating e-learning: Guiding research and practice*. Both published by Routledge, New York.

Learning topic

What is the teaching and learning context?

-

Learner cohort

What are the characteristics of the learner cohort?

-

Learning objectives

What attitudes, skills & knowledge will students ideally have after completing the course?

At the end of this course, you should be able to: (use active verbs – see: Blooms digital taxonomy)

-

Workplace environments - List all potential workplace environments

Where are these attitudes, skills and knowledge applied in real life? .

-

Workplace activities (tasks) - List all potential workplace activities

How are these attitudes, skills and knowledge applied in real-life? .

-

Possible learning scenario

What context might be possible and appropriate in an e-learning course to enable students to learn the knowledge, skills and attitudes of the course?. This could be expressed as:

1. *A problem, an open-ended task requiring analysis, the development of a solution strategy and a solution process*
2. *A project, the development of a product/artefact through a planning and implementation process*
3. *An inquiry, an investigation of a topic or event through a purposeful study based on a series of questions and the collection of data to enable a conclusion to be drawn.*

Appendix 23:

Peer evaluation template: Task 1 - Course analysis

Referred to in Chapter 4: Design of learning environment design on page 66.

Peer evaluation template: Task 1 - Course analysis

Based on some of the elements of authentic learning and authentic tasks identified in: A guide to authentic e-learning (Herrington, Reeves, & Oliver, 2010).

Analysis created by (Peer's name) _____

Course Topic _____

Analysis URL _____

Evaluation completed by (Your name) _____

Please select either 1, 2, 3, 4 or 5 for each of the following questions

Questions to gauge authenticity	Continuum of characteristics						
	Non-authentic	1	2	3	4	5	Authentic
Are the learning objectives written as measurable statements? (e.g., action verbs)	Not measurable						Measurable
Do the learning objectives clearly identify what the learner should be able to do at the end of the course?	Unclear						Very clear
Does the context represent the kind of setting where the skill or knowledge is applied?	Decontextualised						Realistic
Does the task mirror the kind of task performed in real-world applications?	Academic						Real world
Is the task presented as a series of small sub-steps or as an overarching complex problem?	Multiple small tasks						Complex tasks
Are students able to collaborate (rather than simply cooperate) on tasks?	Cooperation						Group collaboration
Are students required to reflect and make decisions about how to complete the task?	Pre-determines steps						Decision making
Does the task require students to discuss and articulate beliefs and growing understanding?	Little discussion						Much discussion
Does the task enable presentation or defence of arguments?	Little articulation						Presentations
Are products or performances polished and refined rather than incomplete or rushed drafts?	Isolated activities or raw products						Polished products
Are students assessed on the product of the investigation, rather than by separate testing?	Separate tests						Integrated assessment

Are there multiple assessment measures rather than a single measure?	Single measure						Multiple measures
--	----------------	--	--	--	--	--	-------------------

Short answer questions:

What are the strengths of the analysis and identified learning scenario?

What areas do you think could be improved? Please explain why and provide constructive suggestions on how they could be improved.

Appendix 24:

Peer evaluation template: Task 2 - Course outline

Referred to in Chapter 4: Design of learning environment design on page 66.

Peer evaluation template: Task 2 - Course outline

Based on the 9 elements of authentic learning and guiding questions identified in: A guide to authentic e-learning. Herrington, J., Reeves, T.C., & Oliver, R. (2010).

Course developed by (Peer's name) _____

Course Topic _____

Course URL _____

Evaluation completed by (Your name) _____

Please select either 1, 2, 3, 4 or 5 for each of the following questions

Questions to gauge authenticity of the learning context	Continuum of characteristics				
	1	2	3	4	5
Does the context of the course represent the kind of setting where the skill or knowledge is applied?	Decontextualised				Realistic
Is the pathway students take through the learning environment flexible, where students are able to move around at will?	Fixed				Flexible
Authentic Tasks	Non-authentic	2	3	4	Authentic
Does the task mirror the kind of task performed in real-world applications?	Academic				Real world
Is the task presented as a series of small sub-steps or as an overarching complex problem?	Multiple small tasks				Complex tasks
Do students work on tasks for weeks rather than minutes or hours?	Short time				Long time
Are students able to choose information from a variety of inputs, including relevant and irrelevant sources?	Limited information				Broad information
Are tasks and strategies relevant to other disciplines and broader knowledge?	Single discipline				Multi-disciplinary
Expert performances & modelling	Non-authentic	2	3	4	Authentic
Does the learning environment provide access to expert skill and opinion?	Direct instruction				Expert performance
Does the learning environment allow access to other learners at various stages of expertise?	Expertise				Levels of expertise
Are students able to hear and share stories	Didactic, core				Narrative,

Questions to gauge authenticity of the		Continuum of characteristics			
about professional practice?					peripheral
Multiple roles & perspectives		Non-authentic	2	3	4 Authentic
Are students able to explore issues from different viewpoints?		Single view			Multiple perspectives
Are students able to use the learning resources and materials for multiple purposes?		Single pathway			Multiple pathways
Collaborative construct knowledge		Non-authentic	2	3	4 Authentic
Are students able to collaborate (rather than simply cooperate) on tasks?		Cooperation			Group collaboration
Are grades given for group effort, rather than individual effort?		Individual grade			Group grade
Promote reflection		Non-authentic	2	3	4 Authentic
Are students required to make decisions about how to complete the task?		Pre-determines steps			Decision making
Are students able to move freely in the environment and return to any element to act upon reflection?		Linear			Non-linear
Can students compare their thoughts and ideas to experts, teachers, guides and to other students?		No facility to compare			Able to compare
Do students work in collaborative groups that enable discussion and social reflection?		Individual			Group
Promote articulation		Non-authentic	2	3	4 Authentic
Does the task require students to discuss and articulate beliefs and growing understanding?		Little discussion			Much discussion
Does the environment provide collaborative groups and forums to enable articulation of ideas?		Individual			Group
Does the task enable presentation and defence of arguments?		Little articulation			Presentation s
Coaching & scaffolding		Non-authentic	2	3	4 Authentic
Are more knowledgeable students able to assist with coaching?		Unsupported			Coaching
Is a teacher, guide or helper available to provide contextualised support?		Unsupported			Scaffolded
Are products or performances polished and refined rather than incomplete or rushed drafts?		Raw			Polished
Do students participate in the activity for		Brief			Extended

Questions to gauge authenticity of the	Continuum of characteristics				
extended periods of time?					
Are students assessed on the product of the investigation, rather than by separate testing?	Separate tests				Integrated assessment
Are there multiple assessment measures rather than a single measure?	Single measure				Multiple measures

Short answer questions:

What did you think were the strongest areas of the course environment?

What areas do you think could be improved? Please explain why and provide constructive suggestions on how they could be improved.

Appendix 25: Progress checklist

Referred to in Chapter 4: Design of learning environment design on page 67.

Authentic eDesign progress checklist

Remember to reflect on the course content, design and your own learning in your blog as you work complete various components of the task. It is a good idea to post an entry each time you complete an activity or reading so you can reflect “in action” to clarify your thoughts and share your understanding with your colleagues.

Activities	Completed
Completed research pre-course questionnaire	
Created a personal blog	
Joined eDesign Groups: Skype and Diigo	
Accessed eDesign Google Docs folder & added Blog URL URL =	
Completed readings Blooms Digital Taxonomy (Churches) Authentic e-learning in higher ed. (Herrington) Authentic learning supported by technology (Herrington & Kervin) Technology as cognitive tools (Jonassen) Students as collaborators (November)	
Analysed course requirements (analysis worksheet)	
Published completed analysis worksheet online & added URL to Google Doc Peer review file: URL =	
Viewed colleagues analysis worksheets & provided feedback	
Written Unit Guide / Plan (course outline)	
Evaluated own course outline (self-evaluation checklists)	
Published course outline as an online document URL =	
Reviewed colleagues course outline(s) & provided feedback (peer evaluation – course outline)	
Modified own course outline based on peer feedback	
Created video presentation of course design	
Published video online & added URL to Google Doc peer review file. URL =	
Invited colleagues to view our video	
Posted regular reflections in your blog	
Posted comments on some of your colleagues blogs	
Completed research post-course questionnaire	

Comments

Appendix 26:

Checklist to gauge authenticity of the learning environment

Referred to in Chapter 4: Social presence analysis on page 67.

Checklist to gauge authenticity of the learning environment

Questions to gauge authenticity	Continuum of characteristics					Evidence from the course
Authentic context	1	2	3	4	5	Evidence from the course
Does the context of the course represent the kind of setting where the skill or knowledge is applied?	Decontextualised			X	Realistic	Yes, participants would apply the skills and knowledge in their role as a university lecturer.
Is the pathway students take through the learning environment flexible, where students are able to move around at will?	Fixed				Flexible X	Yes, all content is open from day 1 and they can move between any elements of the course.
Authentic tasks	1	2	3	4	5	Evidence from the course
Does the task mirror the kind of task performed in real-world applications?	Academic				Real world X	Yes. “Plan an authentic online course for your area of teaching in higher education, create a detailed course outline and present an overview of the course to your colleagues.” (Course information & learning guide, 2012, p.1)
Is the task presented as a series of small sub-steps or as an overarching complex problem?	Multiple small tasks				Complex tasks X	As a complex task. A schedule is provided to help them plan their time and the task is broken into 2 sub-tasks (analyse & then design) to scaffold the learning. However, they need to analyse their own course requirements and identify suitable tasks activities and resources.
Do students work on tasks for weeks rather than minutes or hours?	Short time			X	Long time	Tasks are completed over four consecutive weeks.
Are students able to choose information from a variety of inputs, including relevant and irrelevant sources?	Limited information				Broad information X	Yes, some recommended readings are provided. However, students are encouraged to find and share their own resources about the concepts.

Questions to gauge authenticity	Continuum of characteristics					Evidence from the course
Authentic tasks	1	2	3	4	5	Evidence from the course
Are tasks and strategies relevant to other disciplines and broader knowledge?	Single discipline			X	Multi-disciplinary	Yes. Participants will need to approach the task from a variety of perspectives; such as instructional designers, technology experts and educational professionals in order to create their authentic online course outline.
Expert performances & modelling	1	2	3	4	5	Evidence from the course
Does the learning environment provide access to expert skill and opinion?	Direct instruction				Expert performance X	Yes. Examples of completed course outlines are provided and they have access to the course facilitator who has extensive experience in this field.
Does the learning environment allow access to other learners at various stages of expertise?	Expertise				Levels of expertise X	Yes, via the discussion forums, the Skype chat, the Diigo group bookmarking site and the Google doc folder.
Are students able to hear and share stories about professional practice?	Didactic, core			X	Narrative, peripheral	Yes, via their blogs and examples provided by the facilitator and links to external web resources.
Multiple roles & perspectives	1	2	3	4	5	Evidence from the course
Are students able to explore issues from different viewpoints?	Single view				Multiple perspectives X	Yes, the readings and web links include a variety of perspectives about the concepts and students are encouraged to share their own viewpoint.
Are students able to use the learning resources and materials for multiple purposes?	Single pathway				Multiple pathways X	Yes. Participants can use the learning resources and materials to learn about the relevant concepts covered in the course. They can use them to assist them to complete the tasks and they can also use them for future reference and in their own workplaces.

Questions to gauge authenticity	Continuum of characteristics					Evidence from the course
Collaborative construct knowledge	1	2	3	4	5	Evidence from the course
Are students able to collaborate (rather than simply cooperate) on tasks?	Cooperation	X			Group collaboration	Minimal collaboration required as each participant will create their own unique course. However, they are encouraged to cooperate by sharing ideas and providing feedback to each other.
Are grades given for group effort, rather than individual effort?	Individual grade				Group grade	No. Grades are not applicable for this course.
Promote reflection	1	2	3	4	5	Evidence from the course
Are students required to make decisions about how to complete the task?	Pre-determines steps				Decision making X	Yes. There is no one “correct solution” and participants will need to make many complex decisions in order to complete the task.
Are students able to move freely in the environment and return to any element to act upon reflection?	Linear				Non-linear X	Yes.
Can students compare their thoughts and ideas to experts, teachers, guides and to other students?	No facility to compare				Able to compare X	Participants are encouraged to reflect on the readings, their own work and their peers throughout the course. They are also asked to reflect on their own skills & knowledge prior and after the course.
Do students work in collaborative groups that enable discussion and social reflection?	Individual			X	Group	No. Minimal collaboration is required as each participant creates their own unique course. However, they are encouraged to cooperate by sharing ideas and providing feedback to each other with social spaces (e.g., Group areas on Skype, Diigo, and Google).
Promote articulation	1	2	3	4	5	Evidence from the course
Does the task require students to discuss and articulate beliefs and growing understanding?	Little discussion			X	Much discussion	Yes. Students are required to articulate their understanding at multiple points e.g., after conducting their analysis, by documenting their course outline.

Questions to gauge authenticity	Continuum of characteristics					Evidence from the course
Promote articulation	1	2	3	4	5	Evidence from the course
Does the environment provide collaborative groups and forums to enable articulation of ideas?	Individual			X	Group	Yes. A variety of collaborative spaces have been included to encourage students to communicate and collaborate (e.g., Forums, Skype, Diigo, Google Drive).
Does the task enable presentation and defence of arguments?	Little articulation			X	Presentations	Yes. Each participant will produce a course outline tailored to their specific area of teaching to suits their individual learning objectives.
Coaching/scaffolding	1	2	3	4	5	Evidence from the course
Are more knowledgeable students able to assist with coaching?	Unsupported			X	Coaching	Yes. Through blog comments, discussion forums and Skype chat.
Is a teacher, guide or helper available to provide contextualised support?	Unsupported				Scaffolded X	Yes. The facilitator can be contacted via the Skype chat, discussion forums, email or phone.
Are products or performances polished and refined rather than incomplete or rushed drafts?	Raw			X	Polished	Yes. The course outline they provide should be of a quality that they can use in their own workplace.
Do students participate in the activity for extended periods of time?	Brief			X	Extended	Yes. Tasks are completed over four consecutive weeks.
Are students assessed on the product of the investigation, rather than by separate testing?	Separate tests			X	Integrated assessment	"The course is task-based, so by completing the tasks, you complete the course". (Unit information learning guide, 2012, p.3).
Are there multiple assessment measures rather than a single measure?	Single measure			X	Multiple measures	There is no formal assessment, however, participants submit the documents and video they create to peers and the facilitator for feedback.

Appendix 27:

Coding template for assessment of social presence

Referred to in Chapter 6: Social presence analysis on page 100.

Coding template for assessment of social presence

(Rourke et al., 1999)

Category	Indicators	Definition	Example
Affective responses	Expression of emotions	Conventional or unconventional expressions of emotion, includes repetitious punctuation, conspicuous capitalization, emoticons	“I just can’t stand it when...!!!” ANYBODY OUT THERE!
	Use of humour	Teasing, cajoling, irony, understatements, sarcasm	The banana crop in Edmonton is looking good this year
	Self-disclosure	Presents details of life outside of class or, expresses vulnerability	“Where I work, this is what we do...” “I just don’t understand this question”
Interactive responses	Continuing a thread	Using reply feature of software, rather than staring a new thread	Software dependent e.g., “Subject: Re” or “Branch from”
	Quoting from others’ messages	Using software features to quote others entire message or cutting and pasting selections of others’ messages	Software dependent e.g., “Martha writes” or text prefaced by less-than symbol
	Referring explicitly to others’ messages	Direct references to contents of others’ posts	“In your message you talked about Moore’s distinction between...”
	Asking questions	Students ask questions of other students or moderator	“Anyone else had experience with WEBCT?”
	Complimenting, expressing appreciation	Complimenting others or content of others’ messages	“I really like your interpretation of the reading”
	Expressing agreement	Expressing agreement with others or content of others’ messages	“I was thinking the same thing. You really hit the nail on the head”
Cohesive responses	Vocatives	Addressing or referring to participants by name	“I think John made a good point” “John what do you think?”
	Address/refers to the group using inclusive pronouns	Addresses the group as we, us, our, group	“Our textbook refers to...” “I think we veered off track...”
	Phatics, salutations	Communication that serves a purely social function: greetings, closures	“Hi all”, “That’s it for now” “We’re having the most beautiful weather here”

Appendix 28:

Course evaluation questions mapped against the elements of Col and authentic learning

Referred to in Chapter 7: Cognitive presence analysis on page 113.

Referred to in Chapter 8: Teaching presence analysis on page 134.

Course evaluations questions mapped to CoI and authentic online learning themes

N#	Likert scale statements	CoI Themes	Authentic online learning themes
1	The course context represented the kind of setting where the skill or knowledge would be applied	Cognitive presence	Authentic context
2	The course environment provided a flexible pathway, where I was able to move around at will	Teaching presence	Learning environment
3	The tasks mirrored the kind of activities performed in real-world applications	Cognitive presence	Authentic tasks
4	The task was presented as an overarching complex problem	Cognitive presence	Authentic tasks
5	The activities required significant investment of my time and intellectual resources	Cognitive presence	Authentic tasks
6	I was able to choose information from a variety of inputs, including relevant and irrelevant sources	Cognitive presence	Multiple roles & perspectives
7	The tasks were ill-defined and open to multiple interpretations	Cognitive presence	Authentic tasks
8	The tasks afforded the opportunity to examine the problem from a variety of theoretical and practical	Cognitive presence	Authentic tasks
9	I was required to take on diverse roles across different domains of knowledge in order to complete the tasks	Cognitive presence	Multiple roles & perspectives
10	Task assessment (evaluation) was seamlessly integrated with the major task in a manner that reflected real-world practices (not separate testing)	Cognitive presence	Authentic assessment
11	The tasks allowed a range and diversity of outcomes open to multiple solutions of an original nature	Cognitive presence	Authentic tasks
12	The learning environment provided access to expert skill and opinion	Cognitive presence	Expert performances & modelling of processes
13	The learning environment allowed access to other learners at various stages of expertise	Cognitive presence	Expert performances & modelling of processes
14	I was able to hear and share stories about professional practice	Cognitive presence	Multiple roles & perspectives

N#	Likert scale statements	CoI Themes	Authentic online learning themes
15	I was able to explore issues from different viewpoints	Cognitive presence	Multiple roles & perspectives
16	I was able to use the learning resources and materials for multiple purposes	Teaching presence	Learning materials & resources
17	I was provided with sufficient opportunities to collaborate (rather than simply cooperate) on tasks	Cognitive presence	Collaboration
18	I was provided with sufficient opportunities to reflect on the course content and my own learning	Cognitive presence	Reflection
19	I was required to make decisions about how to complete the tasks	Cognitive presence	Authentic tasks
20	I was able to move freely in the environment and return to any element to act upon reflection	Teaching presence	Learning environment
21	I was able to compare my thoughts and ideas to experts, teachers, guides and/or peers	Social presence	Communication – Interactive expression
22	I was able to work in collaborative groups that enabled discussion and social reflection	Social presence	Social collaboration
23	The tasks required me to discuss and articulate my beliefs and growing understanding	Cognitive presence	Collaborative construction of knowledge
24	The environment provided collaborative group spaces and forums that enabled articulation of ideas	Social presence	Social collaboration
25	The environment enabled more knowledgeable learners to assist with coaching	Teaching presence	Learning environment
26	The facilitator provided contextual support and guidance	Teaching presence	Coaching & scaffolding
27	The facilitator provided timely and helpful feedback	Teaching presence	Coaching & scaffolding
28	The activities culminated in the creation of a polished product that would be acceptable in the workplace	Cognitive presence	Authentic tasks
29	The task enabled me to present my finished product (concepts & ideas) to a public audience	Cognitive presence	Authentic tasks
30	The activities allowed for multiple assessment (evaluation) measures	Cognitive presence	Authentic assessment
31	I felt comfortable learning in an open environment	Teaching presence	Learning environment

N#	Likert scale statements	CoI Themes	Authentic online learning themes
32	The technologies I was required to use in the course aided my learning	Teaching presence	Technological affordances
33	The recommended readings were useful for learning about the concepts covered in the course	Teaching presence	Learning materials and resources
34	The technologies used in the course demonstrated some of the ways these tools could be used to assist student learning	Teaching presence	Technological affordances
35	Overall I thought the course was a useful professional development opportunity		

Appendix 29:

An example of the quality of participant's reflection and engagement

Referred to in Chapter 7: Cognitive presence analysis on page 121.

An example of the quality of reflection and engagement that occurred on the blog sites

Quote: There are likely to be advantages and disadvantages to online teaching when it comes to being an outstanding teacher (SA-3, Blog).

Comment 1: I found this quote very interesting, as I am quite ambivalent about aspects of the online world. I am passionately interested in the sensuality of being immersed in the world, especially in very remote and wild places in the natural world and the richness of world of the senses. I noted with interest that the Netiquette item we needed to read as part of this course made a number of references to the things that one needed to make sure to do/not to do online to make up for some lacks in communication in the virtual world. I wonder whether there might be teachers who are outstanding in F2F teaching, in embodied classrooms, who might not feel as comfortable teaching online (KL-3, Blog)

Response from author: Sorry I am probably being naughty as I don't think I am meant to reply until the second person has replied but your comment was so relevant to something that I have experienced in my life when I have engaged with an online discussion forum! ...Well the first time I ever joined an online discussion forum I made a post in response to a question about a herb and as I know lots about herbs, I put up a detailed response for them with links to information that might be helpful. I explained in detail why it probably wouldn't be best for what they wished to use it for etc. Well the person responded, as did a couple of others that I was incredibly rude!! It shocked me, as all I had done was provided information from official sources and explained why they shouldn't use something for the purpose they intended. My response had no emotion in it at all yet it was perceived as rude! I apologised and explained that was not my intention at all and whilst they were rather rude to me back they basically told me that the way I write made them "feel" dumb and I should write without using such complicated words! (SA-3, Blog).

Comment 2: I am in full agreement of your conversation with [name deleted]. I do worry about ability of an outstanding teacher to be responsive in this environment. Lack of F2F means the nonverbal cues amongst the words cannot be read. Hence probably your experience of being misinterpreted as 'rude'. I have had similar experiences. As the writer, I am unable to add depth to this comment with my facial expression, and am unable to read yours and so adjust and clarify what I am trying to say. An outstanding teacher is compromised in her ability to respond timely to a student's needs not explicitly written / verbalised in this medium, or connected e.g., on Skype how much relies on writing skills, in conveying tone and meaning as one actually meant it? (VT-3, Blog).

Response from author: Thank you both. I loved both your comments because that really is the biggest hurdle with onlineness (is that a word?) is the whole effective communication thing. They say that 80% of any meaning of our F2F communication is derived from body language....yet all you really have are smiley and sad faces and these aren't all that good. Anyway, I posted this quote as the concept of an "outstanding teacher" took me back to a post grad class I took on learning theories a few years ago. In the first class we were asked to

write down on a piece of paper 5 qualities (one word only) that we associated with an outstanding teacher.....well it was very cool because even though we were from all over the world, different religions, different cultures we all read out really similar qualities e.g., caring, enthusiastic, organised, motivating, thoughtful, approachable, wise etc. All qualities generally associated with someone's personality! Therefore, that has to be one massive obstacle to adjust to in terms of online teaching to be considered outstanding when your personality qualities are so compromised in the online environment! It also makes me think of a person that I know in real life and also in their online domain. In real life they are really socially awkward, rather difficult to engage with and has few friends but online they are the complete opposite - funny, happy, the life of the conversation, very well liked etc. etc. Therefore I am sure there are teachers who are going to be outstanding online who might not necessarily be outstanding F2F? Maybe it is not the fact someone is an outstanding teacher, maybe it is if they are an outstanding teacher in that particular environment and the trick being all about learning to be outstanding in that environment! (SA-3, Blog).

Appendix 30:

Learning materials and open access resources

Referred to in Chapter 8: Teaching presence analysis on page 147.

Example learning materials and open access resources

Authentic eDesign LMS (Restricted access): Demo - Authentic eDesign v2 (Guest access – no student data) <http://elearnopen.info/ecourses/>

Authentic eDesign companion website (Public access): Demo - Authentic eDesign v2 (no student data) <https://sites.google.com/site/authenticdesign2demo/>

Technology Toolbox for Educators (OER license):
<https://sites.google.com/site/technologytoolboxforeducators/>

YouTube videos:

- eDesign course playlist (OER license)
<https://www.youtube.com/watch?v=RlxKcFoWLo0&list=PLD6CA7E6oBo66A312>
- Authentic learning videos (Herrington – Public access)
<http://authenticlearning.info/AuthenticLearning/Home.html>

Jing screencast videos (OER license): Authentic eDesign folder
<http://www.screencast.com/users/jennip98/folders/eDesign>

Diigo eDesign groups (Open to view, only members can edit): Example iteration 3
<https://groups.diigo.com/group/edesign-2014>

Google Drive folders (Public-View only access):

- Example completed documents (no data): <http://bit.ly/GDrive-eDesign-Examples>
- Example templates and sign-up sheets for learner activities (no data): bit.ly/GDrive-eDesign-Templates

Appendix 31:

Conative skill strategies included in the course

Referred to in Chapter 8: Teaching presence analysis on page 148.

Strategies instantiated in the course to support conation and how they supported participant learning

Conative strategies	How they supported participant learning
Announcements	Regular weekly announcements to prompt the user about important information.
Goal setting	A pre-course survey to identify why they wanted to do the course, what they wanted to get out of the course and any issues they wanted to resolve.
Planning tools	A schedule of tasks and due dates was provided to assist learners with planning their time, albeit with flexible dates.
Monitoring tools	The task completed feature on the LMS enabled learners to monitor their progress through the course content and activities.
Choice and decision-making	Learners selected their own topic for the course outline and were required to make decisions about what to include and how to present it.
Self-evaluation	Learners were provided with authentic learning checklists that they could use to self-evaluate their work.
Self-reflection	Learners were encouraged to reflect on their learning and articulate what they learnt, the learning processes they used and how they could apply their learning.
Peer-reviews	Learners were able to review their peers' work to see how others interpreted and applied the concepts to their area of learning.
Variety of resources	Learners were provided with access to a range of open educational resources that enabled them to explore the concepts from multiple perspectives and select the most appropriate ideas and resources to complete the tasks.

Appendix 32: **Dissemination of research papers**

Referred to in Chapter 10: Conclusion on page 181.

Dissemination of research papers

Publication type	Paper
Journal article	Parker, J., Maor, D., & Herrington, J. (2013). Authentic online learning: Aligning learner needs, pedagogy and technology. <i>Issues in Educational Research</i> , 23 (2). pp. 227-241.
Conference papers (Peer reviewed)	Parker, J., Maor, D., & Herrington, J. (2013). Under the hood: How an authentic online course was designed, delivered and evaluated. In: <i>Teaching and Learning Forum 2013: Design, develop, evaluate - The core of the learning environment</i> , 7 - 8 February 2013, Murdoch University, Murdoch, W.A
	Parker, J. (2011). Practitioner practices for designing and delivering online higher education courses within a learning management system. In: <i>20th Annual Teaching Learning Forum</i> , 1-2 February 2011, Edith Cowan University, Perth.
Conference presentations (Abstracts)	Parker, J. (2012). Designing and delivering authentic online learning: A design-based research approach. In: <i>MUPSA Multidisciplinary Conference 2012</i> , 27 September 2012, Murdoch University, Murdoch, W.A.
	Parker, J. (2012). Authentic e-design: An online professional development course for higher education practitioners. In: <i>27th Annual Research Forum (Western Australian Institute for Educational Research Inc) Transforming practice: The value of educational research</i> , 11 August 2012, University of Notre Dame, Fremantle, Western Australia.
	Parker, J.(2012). eDesign: An authentic online learning course using Moodle paired with an open companion website. In: <i>MoodleMoot au</i> , 1 - 4 July, Gold Coast, Australia.
	Parker, J. (2011). A design-based research approach for creating effective online higher education courses. In: <i>26th Annual Research Forum (Western Australian Institute for Educational Research Inc) Educational Possibilities</i> , 13 August 2011, University of Notre Dame, Fremantle, Western Australia.
Murdoch research repository (Public access)	Publications: Parker, Jenni http://researchrepository.murdoch.edu.au/view/author/Parker,_Jenni.html
Research websites (Public access)	Authentic eDesign research website: http://www.elearnopen.info/research-eDesign.html
	Technology Toolbox for Educators: https://sites.google.com/site/technologytoolboxforeducators/