Wrestling, wrangling and reaping: An exploration of educational practice and the transference of academic knowledge and skill in online learning contexts

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Abstract

Throughout the world, the field of education finds itself in a state of flux as it endeavours to integrate a potentially powerful mix of communication media and innovative technologies. Online environments currently represent one of the fastest growing contexts for adult learning and offer an educational domain with a unique potential for interaction, participation and collaboration. Perpetual technological development has created a relentless demand for new knowledge and skills. Against this backdrop academics, with little or no history of online learning are charged with the task of designing and developing authentic, effective, online educational experiences for a diverse range of students. Although there is recognition that the intersection between education and technology requires more than the replacement of the old with the new, most academics utilise today's technical tools to administer teaching and learning and provide access to content. Thus, the pedagogical potential of online learning contexts are yet to be fully realised. This paper explores the relationship between educational theory and pedagogical practice and examines the process and potential transference of academic knowledge and skill within different online learning contexts. The discussion is based on the experience of the authors, with knowledge and skill in the development and implementation of online teaching and learning, using three different course management systems. The content, which is primarily reflective, is grounded in practice and theoretically based. The paper culminates in a discussion of the implications for educational practice of the transference of academic knowledge and skill within online learning contexts in the higher education sector.

Key words: course management systems, higher education, interactive learning online learning, skills transfer

Introduction

Teaching is a highly complex activity that draws on many kinds of knowledge. It involves a range of roles and responsibilities which include pedagogical, social, managerial, and technical components. Berge (1995) reports that in traditional settings these roles and responsibilities will only be carried out by one individual in

their entirety on rare occasions. In the interim views of teaching and learning have changed and technological advances have affected educational practice. As a consequence, today, most academics are required to fulfil each of these roles, concurrently, with each offering of a computer mediated course. This represents one of several challenges experienced by online academic educators.

Although there is diversity in the combination and mode of online courses, higher educational institutions utilise some form of course management system (CMS). At their most basic, CMSs provide academics with access control and tools to create a course web site that only enrolled students can view. CMSs also provide a means with which to upload and share course materials, hold online discussions and chats, develop and administer quizzes and surveys, gather and review assignments and record grades. Between 2003 and 2010, Central Queensland University (CQU) supported two CMSs: Blackboard and Webfuse, which was developed in-house (Jones, 2009). The first author had used Blackboard since 2003 and the second author had used Webfuse since 1998. In 2010 the university adopted Moodle as its new CMS (Central Queensland University, 2010). As a result of this change all academic staff, within the institution were required to adapt their knowledge and skills to work with the new CMS. The challenge that this change brought about represents an important issue in higher education. Beatty and Ulasewicz (2006, p. 36) acknowledge that "[o]nline teaching and learning has been in transition for its entire existence" to some extent it is this ongoing transition that requires academic staff to be able to adapt to inevitable changes in online learning and teaching environments.

This paper explores the relationships among learning theory, educational technology, academic knowledge and educational practice in order to understand how best to support learning and teaching in online contexts. The paper documents how the authors (both academics at CQU) wrangled to construct interactive learning experiences for their students wrestled with divergent technologies to meet teaching and learning needs and explores how academics may be assisted to reap the benefits of the new CMS tool that CQU has made available to them.

Literature review

There is general recognition that the inclusion of technologies in education represents change at every level including: pedagogy, curriculum, policy, infrastructure, and organisation and governance at institutional and system levels (Moyle & Owen, 2008). As a result technological innovation is creating a broad based, continuous, demand for new skills (Hodgins, 2000). The extent of change within the field impacts upon the academic at every level, but is, arguably, most challenging for those responsible and subsequently held accountable for the instructional design and development of online courses and the creation of effective learning experiences. Until now, this development has, for the most part, consisted of converting traditional content into a screen based format (Ladyshewsky, 2004), a practice that has earned considerable criticism within educational literature. Based on the interactive capacity of communication technology (Leasure, Davis, & Theivon, 2000), there is a perception that the potential of and the opportunities afforded by online learning environments have been poorly exploited (Oliver & Herrington, 2003). This view is supported by Malikowski, Thompson and Theis (2007) who observe that CMSs are more often used for transmitting information to students and less often used for interactive learning activities.

Consequently, one of the major challenges facing academic educators today is engagement of students in active learning environments (Kofoed, 2004). Interaction among learners is acknowledged to make a positive contribution towards student learning and recognised as a significant component of successful online learning (Su, Bonk, Magjuka, Lui, & Lee, 2005). Although online contexts support interactive teaching and learning (Leasure, et al., 2000) student contributions via electronic posts often lack interactive characteristics (Davis & Rouzie, 2002). Some academics are of the view that this is due to the nature of the online learning environment, which is computer-mediated, text-based and time dependent (Gunawardena et al., 2001). Others on the other hand maintain that two-way interaction is not an inherent part of communication technology and that interaction and learning may not occur if the social structure of the course permits passive compliance (Chou, 2002). It has also been argued that if interaction is too interactive it may have a detrimental effect by overwhelming the capabilities of some learners (Levin, 2005). It is apparent, therefore, that the outcomes of interaction are determined not only by the online context but they are also tied to the instructional design of the course (Chou, 2002). As a result academics are required to encourage and enable learners and at the same time effectively facilitate and implement an online course using a CMS in a way that has a significant impact on student learning (Sharpe, Benfield, & Francis, 2006).

Chou (2002) asserts that carefully constructed courses are essential when attempting to foster relationships among learner, content and technology. However there is recognition that without proper pedagogical training and online experience academics will replicate their own best teaching and learning practices (Gold, 2001). Academic educators may also find it difficult to improve practice and learning if they are unable to perceive or create links between their teaching and student learning (Lally & De Laat, 2002). Given that changes in educational delivery do not in themselves lead to a significant impact on learning outcomes there is a need for educators to focus on the development of pedagogical initiatives within online courses (Gold, 2001; Ladyshewsky, 2004).

Conceptual framework

Constructivist views of learning pervade contemporary educational literature (Howe & Berv, 2000), represent the dominant learning theory (Karagiorgi & Symeou, 2005) and are frequently associated with online learning (Garrison, 2009; Kilpatrick & Bound, 2003). Constructivism is a theory about knowledge and learning as it describes what knowing is and how one comes to know (Fosnot, 2005). From this perspective, individuals are assumed to construct knowledge by building on their experience, continuously refining their knowledge of the world through interaction, negotiation and collaboration in social and cultural contexts (Kanuka & Anderson, 1998; Palinesar, 1998). Learning and understanding are considered inherently social and the use of tools and activities is believed to be integral to conceptual development (Palinesar, 1998).

Vygotsky (1986), a psychologist, from whom the concept of social constructivism originated, conceptualised human development as the transformation of shared activities into internalised processes and believed that by internalising the effects of working with others learners acquire useful strategies and crucial knowledge (John-Steiner & Mahn, 1996) which may be applied in future learning situations. The underlying assumption within current educational literature and the premise of Vygotsky's theoretical framework is that learning is a dynamic, interdependent, intrapersonal and interpersonal process. Consequently each interaction and learning

event has the potential to contribute towards and potentially extend the learner's knowledge and understanding, and the outcomes (knowledge, understanding and skill) become tools to be applied in multiple and diverse situations. Thus learning, which is based on previous experience and shared knowledge, may be viewed as a continuum and a continuous, lifelong activity.

Although constructivist theories are frequently utilised as conceptual frameworks in the analyses of computer-mediated discussions and knowledge construction in online learning environments (Hendriks, 2002; Schrire, 2002; Veldhuis-Diermanse, 2002), the relationship between social constructivism and online communication is considered tentative and not fully supported by previous research (Hendriks & Maor, 2004). Indeed Wise and Quealy (2006) question the compatibility of a social constructivist framework within education and refer specifically to the opposing agendas of instructional design and institutions. Their concern relates to what they perceive to be limited formal control over what is being learned or how it should be learned within a constructivist framework. Their argument, in some respects, reflects historical beliefs about the form and focus of distance education and anxiety over the move to a learner-centred rather than a teacher-centred approach. It also draws attention to important differences in the roles and responsibilities of educators and learners in contexts which are designed to facilitate learner interdependence rather than learner dependence. Discussion of the concerns and practical implications of a constructivist theory of learning is relevant as there is limited evidence of constructivist pedagogies being implemented in online learning contexts (Kilpatrick & Bound, 2003).

Vygotsky's theory of human development (1986), which has relevance in discussions about teaching and learning in online contexts (Rossi, 2010), can be viewed as a pedagogical framework and a tool with which to demonstrate the application of theory as well as the transferability of knowledge and skill. Appropriation is recognised as the process of taking something that belongs to others and making it one's own (Wertsch, 1998). The procedure has also been used to explain the extent to which individuals are able, be they teachers or learners, to adopt and adapt the educational tools available for use in particular social environments. Within the literature it is acknowledged that there are varying degrees of appropriation which range from a lack of appropriation through to achieving mastery. The continuum incorporates appropriating a label, appropriating surface features, and or appropriating conceptual underpinnings. Although this range may be viewed as developmental the fact is an individual may appropriate a concept without knowing the concept's label (Grossman, Smargorinsky, & Valencia, 1999). For example an academic may hold and implement a particular philosophy about teaching and learning but only later come to know the name used to describe that philosophy.

The implementation of online educational practices entails the addition of a technical element to traditional teaching practices. This introduces tension within educational practice as the academic juggles the social and technological aspects of the CMS. Humans may have designed and developed the CMS, but once created the CMS technology influences the way that people use it. That fact that technology can shape how people use the innovations that emerge is important as technology can also be conceived to affect the ways academics transfer skills and knowledge from one CMS to another. In this respect technology can be a helper or an inhibitor (Luck, 2008), and discussion of the socio-technical aspects of teaching and learning in online contexts draws attention to the work done by lecturers, technicians and other staff in moving from one CMS to another.

A number of factors are recognised to impact on an academic's ability to appropriate and therefore to transfer knowledge and skill. These include the social context of learning and individual characteristics. The social context relates, as one might expect, to the environment in which learning takes place, but need not necessarily relate to a physical structure. Rather it incorporates underlying philosophies, pedagogy, relationships among participants, anticipated outcomes and prevailing cultures within schools, faculties or institutions. Essentially it is about why, how and by whom educational tools are used. By contrast specific characteristics relate to the observations and experiences, of individuals, accrued over time and include personal goals, expectations and the academic's knowledge and belief about content (Grossman, et al., 1999). Based on the literature review and the explanation of the principals of constructivist learning it may be apparent that these factors are significant and are of particular relevance in the development of online courses. The following section discusses the transition of educational practice from a traditional teaching and learning context to an online CMS supported environment.

Wrangling to adapt existing educational practices in an online learning context

The relevance of Vygotsky's theory (1986), in online contexts lies in his explanation of the dynamic interdependence of social and individual processes in knowledge construction (Rossi, 2010). It is also acknowledged that pedagogy has a direct impact on the results of learning and that the effectiveness of a course cannot be separated from the theoretical grounding of its instructional design. The educational philosophy and practice of the authors is informed and guided by the principles associated with a social constructivist perspective of learning (Rossi, 2010). Fosnot (2005) asserts that "a constructivist view of learning suggests an approach to teaching that gives learners the opportunity for concrete, contextually meaningful experience through which they can search for patterns; raise questions; and model, interpret, and defend their strategies and ideas" (p. ix). Research also indicates that an interactive educational process, which facilitates critical thinking, is dependent on several factors, which include: an appropriate course design, the interventions of the instructor, course content and student characteristics (Bullen, 1998). This view is supported by Chang (2002), who maintains that asynchronous learning can promote critical thinking if supported by a constructivist instructional design, cooperative or collaborative learning, critically reflective learning strategies and opportunities to engage multiple perspectives.

The first author's experience of online teaching and learning was, initially, derived from a first year unit of study within an undergraduate degree. Historically, the course had been offered over a 10-year period on-campus, across multiple campuses and off-campus through print-based materials. Course content introduced learners to different types of communication within a broad range of health care settings and facilitated the exploration of communication techniques within groups, with a view to improving health outcomes, through effective communication. An opportunity to remodel the course for online delivery presented itself in 2003. The intention, within the 2004 offering of the course, was to structure an authentic learning experience, with clearly demonstrable links between content and practice and to provide the cohort of off-campus students with an interactive learning experience, through online discussion, that would reflect the educational experience of on-campus students in face-to-face tutorials (Rossi & Hinton, 2005).

The course was offered online for the first time in 2004, via Blackboard, a CMS which had been newly adopted by the university. 177 students enrolled in the course; however, contrary to expectation students were not offered an on-campus mode of delivery. Upon the decision to change to a single mode of delivery the teaching team within the school was reduced from four campus-based lecturers to one staff member (Rossi & Hinton, 2005). The decision, made at a School level, required the course coordinator to facilitate an interactive, online learning experience for a large cohort of off-campus students who, for the most part, had anticipated an on-campus mode of learning (the expected size of the off campus cohort had been in the region of 40 students). Implementation of the interactive online course proved to be time consuming and the coordinator was grateful for the offer of assistance from a colleague who had prior knowledge of the course; however, is it important to note that teaching within the online course was not factored into the volunteer's workload. Owing to the restructure of two undergraduate programs, the number of enrolments reduced significantly; in 2005 a total of 34 learners enrolled in the course. Informed by experience, derived from: modifications to learning activities in 2005; personal research, of the 2004 and 2005 offering of the course; and student evaluations the aim within the 2006 offering of the course changed. Rather than wrangling to replicate a face-to face experience in an online context the coordinator endeavoured to introduce learners to theoretical concepts and encouraged them to reflect individually and collectively upon their personal and professional experiences in order to identify needs, strengths and weaknesses in respect of communication. Through a range of interactive, learner-centred activities, students were offered opportunities to enhance personal, therapeutic, organisational and educational communication skills and to develop the ability to participate as effective members of a small, multidisciplinary team. The teaching and learning strategies were intended to encourage the active engagement of students with course content, fellow students and the course co-ordinator.

The following description of the final offering of the course is offered to show how, and the extent to which, theoretical concepts can be appropriated and applied in diverse learning contexts. Learners were required to communicate online and to collaborate in groups of different size asynchronously and synchronously to complete learning activities. Participation was an assessable component of the course and 25% of total marks were awarded for learner participation in large group, small group and individual activities. Activities encouraged learners to reflect on personal experiences, demonstrate their understanding of the connection between experience and theoretical content and to comment, constructively, on the contribution of others, by providing reasoned rationales for their perspective. The educational goal was to promote critical reflection and to expose individuals to a range of different experiences, thoughts and understandings which may enhance their learning and understanding. The marking criteria, which outlined the allocation of marks, promoted collaborative discussion and encouraged the integration of theory and references to literature within learner contributions.

The wrangle to construct interactive learning experiences in respect of this particular course can be found embedded in divergent assumptions and educational expectations. For example, the decision to offer an online course, which was designed as an interactive learning experience for 40 students, to a cohort of 177 learners draws attention to and emphasises discordant organisational suppositions about the use of technology within online courses. Admittedly the basis for these assumptions may be found in criticisms levelled at online courses and the perception that CMSs such as Blackboard and/or Moodle—which generally focus

in content delivery—do not lend themselves to student centred teaching and learning (Blacker, 2005). As a result, perhaps the criticism directed towards those responsible for the development of online courses is misdirected, given that it is widely acknowledged that it takes time, practice and support to implement interactive technologies effectively.

Between 2006 and 2010 there would appear to have been organisational recognition of the time required to construct and maintain interactive online learning communities. However a cursory review of the online course offered by CQU reveals that many courses are content orientated. While in 2006 it could be considered fairly innovative to construct an interactive online communication course in 2010 such courses remain uncommon. Five years on academic staff who desire to incorporate innovative educational practices have to wrangle with the perceptions of students who have become accustomed to the prevailing culture of content-centred courses and students who appear unwilling to invest time and effort to engage in online interaction and collaboration.

Wrestling to transfer academic knowledge and skills to new technologies

Conceptualising technology and society as being parts of a dynamic setting whereby people and technologies mutually shape each other is a metaphor for the messy situation created by the impact of technologies in the higher education environment (Instone, 2004). It helps explain the resistance of some academic staff to employ CMS technologies in their teaching and the limitations of CMSs being used in a teaching situation. It is difficult for academic staff to be creative with their teaching when implementing a new CMS because staff may struggle to understand the nuances of the CMS and until they do it can restrict their teaching strategies. In other words the technology shapes how they teach.

In 2010 CQU converted from BlackBoard (proprietary CMS) and Webfuse (in-house CMS) to an open source CMS – Moodle. The implementation of Moodle as the new CMS at CQU presented the second author with a challenge. How to adapt the courses created using Webfuse to the Moodle platform? Were the knowledge and skills developed over many years wrestling with the previous CMS transferable to Moodle? While there is literature available which examines how tertiary students can be taught to transfer technology skills from one context to another – for example see Billing (2007) – there is a dearth of literature about how academics can transfer their academic knowledge and skills from one context to another. This section explores how the second author wrestled to transfer and adapt the knowledge and skills gained using Webfuse CMS to create course websites in the Moodle platform.

It has been determined that moving from one CMS to another involves more than just converting existing course content and importing it into a new CMS. Converting to a new CMS may in fact require the redesign of each course (Chao, 2008). Even at a basic level the move from Webfuse necessitated the restructure of content to fit in with Moodle's file and web page structures. Further revision was required if the academic staff desired to utilise the tools in Moodle that were not available in the previous CMS and vice-versa. In the report by Chao (2008, n.p.) it was estimated to take "at least three times as long to convert a course from the old system into the new system compared with developing the same course in the old

system". Hence, converting existing courses to a new CMS involves a significant increase in the workload of academics and support staff.

The transition to Moodle will be examined by first describing the similarities between Webfuse and Moodle. This will be followed by an analysis of the positive and negative transfer of knowledge and skills from one CMS to another. Webfuse was created by a Senior Lecturer at CQU who had been an early adopter of Internet-based technologies in his teaching. He realised that instead of creating a new website from scratch each year for each course it would be better to use a template to create the new course websites and copy over material from previous offerings. Hence he created an application to generate course webpages called Webfuse as it 'fused' together various Open Access software applications (Jones, 2009). The development of Webfuse became the focus of a Doctoral thesis (Jones, 2011). Moodle had similar origins. It evolved from a Doctoral research project by the webmaster at Curtin University (Dougiamas & Taylor, 2003). At the date of writing this article the thesis had not been completed owing to the success of Moodle (see, http://dougiamas.com/thesis/). Hence both Webfuse and Moodle were created and developed by a small group of people at universities on opposite sides of the Australian continent. Both CMS applications were created and developed by academics working in the Australian higher education industry using open source software that was freely available from the Internet. Whereas Webfuse was only used at CQU, Moodle has grown to become a world-wide phenomenon. It is a CMS supported by an active community of developers located in many different countries (Moodle, 2011).

Positive transfer occurs when the skills learnt from using one application make learning the new application easier. Trainers can aid this positive transfer by making sure the individual understands the similarities between the two applications so that skills learnt using the first CMS can be transferred more easily into the second CMS. Owing to the similarities in the origins of both Webfuse and Moodle the second author found it relatively straightforward to learn how to use Moodle. The philosophies behind the designs of both CMSs were similar so the mental model of a CMS that she had formed while learning and using Webfuse was transferrable to Moodle. Once she had learnt the logical framework of Moodle and how to use the website editor it was a relatively straightforward process for her to create a course website. Hence there was a positive transfer of knowledge and skills in the creation of a course website when moving from the in-house designed and maintained CMS (Webfuse) to the community designed and maintained CMS (Moodle).

Negative transfer occurs when having learnt to use one CMS, makes learning the second CMS more difficult. This can happen when the new CMS has a different conceptual design than the original CMS. Negative transfer can be avoided by making sure the course coordinator is aware of the different design features and making it clear what the differences are in the design of the CMSs. There was one significant difference in the design of the two CMSs. Webfuse was created as one integrated system, whereas Moodle was created using a series of modules linked together. Moodle's modular design simplified the creation of new modules by multiple programmers and developers. Unfortunately this created problems for the users of Moodle. Sometimes more than one switch had to be turned on to make something work. For example, to see students in groups the course coordinator had to know to select 'groups' in the settings module as well as to select 'groups' in the assignment module as the setting was not inherited from one module to the other. This caused confusion as the second author was used to selecting a particular

setting within Webfuse and that setting then being inherited by the integrated applications. Hence the modular design of Moodle increased the complexity for course coordinators using it as a CMS because you needed to understand the modular structure to be able to implement particular settings within Moodle.

The biggest problems with respect to negative transfer of skills and knowledge emerged with the management and markings of assignments. In Webfuse the online assignment submission was created to reflect CQU's complex multi-campus model and large courses (greater than 500 students). The second author was used to teaching courses that were offered across up to 10 CQU campuses. Webfuse supported multiple markers being able to access, mark and upload marked assignments. As course coordinator the second author was able to access her own assignments for marking but could also keep an overview of the status of all the assignments. That is, she could see on the assignment management webpage whether assignments had been submitted by the student and after being submitted when it was collected, marked and uploaded by a particular marker. After moderation of the assignment marking the course coordinator could either selectively release marks to individual or groups of students or release all the assignments. In Moodle it is assumed that the once the marked assignments are uploaded they can all be released at the same time by 'unhiding' the assignment so that the students can view them. As the model of learning and teaching at CQU is complex—large courses delivered internally across up to 10 campuses plus distance students—this simple process of having all assignments 'hidden' or 'unhidden' was not sophisticated enough to cope with multiple markers. The second author had to 'hide' all assignments and then individually release assignments as they were marked, uploaded and moderated. It was also more difficult to withhold an individual assignment, for example if it were subject to a plagiarism report it needs to be hidden until the plagiarism has been checked and a penalty applied (if necessary). The design of the Moodle assignment module was based on the assumption that the entire class was co-located. The complexity of the multi-campus teaching model at CQU is not easily handled by Moodle causing increased work for the staff – both academic and professional.

A major advantage of an in-house development is that it is more likely to address local issues. As Webfuse was created in-house the course coordinators could talk directly to the programmers involved in the design and management of Moodle. This meant that the Webfuse staff could more easily understand what was required and create a solution. When CQU adopted Moodle the university did not seek to employ dedicated Moodle programmers. Several existing programmers were tasked with adapting different parts of Moodle. This meant that there was a disconnect between the users of Moodle and the programmers who could fix the problems. Course coordinators were trained by local staff in the Information Technology Division (ITD). During training sessions attended by the second author, several people made suggestions and raised issues with the structure and use of Moodle. As these suggestions and issues were not recorded and the trainers did not feed them back to the programmers this valuable feedback was not passed on to the programmers who could address the suggestions and problems. This resulted in frustration for academic staff when teaching with Moodle for the first time as the problems were not fixed before teaching started.

The process of giving feedback to programmers who could address the academic users' issues was further complicated by CQU relying on an external company (Netspot) to complete some of the implementation of Moodle. The academic users of the system had to log suggestions and problems with the service desk staff and

the Moodle implementation project manager then decided which of these suggestions and problems would be passed on to Netspot. Hence, there were at least three people in the communication chain between the academic users and the programmers who were tasked with implementing changes to Moodle. The longer the communication chain, the less likely it was that academic users' concerns would be communicated correctly to the people who could fix the problems.

The change to Moodle was a difficult one as the academic staff had to learn new processes and procedures. Much effort was expended in learning new processes and tools. There were repressions of creativity as course coordinators wrangled to transfer knowledge and skill to the new CMS. After using Moodle for a teaching term it became easier to experiment with Moodle and to explore the features and tools for learning available in Moodle that were not available with the previous CMSs.

In conclusion, when converting to a new CMS a large part of the challenge for academics is to master the new language, jargon and commands and to translate and transpose existing knowledge and skills from one CMS to another. The authors would agree with Chao's (2008) argument that converting existing courses to the new CMS did take approximately three times as long as developing the same course in the old system. The appropriation of knowledge and the transferability of knowledge and skill may not as difficult as learning to use a CMS for the first time but there are pedagogical and technical issues to be overcome. Thus the use of a CMS requires not only the adoption of a new technology but also the adaption of the individual pedagogical techniques used by academic staff to implement in the new CMS application, which may be time consuming.

Not yet reaping: Implications for educational practice

Universities are still struggling with the move to online learning and development of new skills using new technologies. A feature of higher education throughout the world is that academics generally teach their students the way that they were taught, for example, using a traditional one-to-many, teaching paradigm based on face-to-face lectures and discussion among smaller groups in tutorials. With some exceptions, this paradigm is entrenched in most university cultures. Hence this teaching paradigm has a significant influence in shaping the effects from the introduction of a CMS within institutions of higher education (Dutton, Cheong, & Park, 2004). The transfer of skills and knowledge is primarily one of understanding how to use technology to support existing teaching practices.

The ability to observe, monitor, redirect and record the interactions, learning activities and outcomes of online pedagogical practice provide a transparency about the process of teaching and learning, and as a result offers benefits not realised within traditional environments. The features of CMSs that may be used to enhance student learning can be equally beneficial in the preparation and development of staff involved in the design, implementation and evaluation of educational courses with an online component. Although the main focus in the creation of online courses has been on technological issues (Swan et al., 2000), social and pedagogical aspects are considered to play a far bigger role in the creation of a successful online learning environment (Mason, 1994).

Creating an effective learning environment includes not just the CMS and computers but also the social relations of education which influence how academics work and how students learn (Nardi and O'Day, 1999). At CQU there is a lot of hype around the need to design better online learning environments for students yet training academics to create these online learning environments is generally an afterthought. For example, professional development activities using Moodle at CQU have predominately consisted of how to understand and use the commands in Moodle to create course websites, not how to design and implement activities to create interactive learning environments.

The lessons learnt as a result of wrangling to adapt educational practices within online learning contexts led to insights about how learners interact and construct knowledge in groups of different size using synchronous and asynchronous communication. They also draw attention to factors which are conducive to learner-learner interaction, dialogic learning and the development of a sense of community within online learning contexts (Rossi, 2010). Within the exemplar learners acknowledged a connection with others that was based on the relationships that they developed with peers in learning groups. As group members, they shared personal and group goals and devised strategies which enabled them to negate the challenges that they encountered within the online context. They were open with one another and disclosed information which enabled others to acknowledge both shared and diverse experiences; they invested time and effort and worked together to achieve their learning objectives and they offered and received emotional and material support which reinforced their perception that although they were distant from one another they were not alone.

The ability to engage with students and encourage and inspire them to reach their full potential through online teaching is difficult. In order to be successful in transferring knowledge and skills to new technologies and between CMSs academics require:

- the support of educational designers so that they may develop the confidence to explore new teaching strategies in the online environment
- technical staff to support the new technologies that they must now utilise to support their teaching
- institutional support as they adopt new teaching strategies and
- to exploit new technologies in ways that create innovative supportive environments which help students to address their educational needs through interactive learning.

Conclusion

This paper discussed the relationship between educational theory and pedagogical practice and examined the process and transference of academic knowledge and skill within online courses. Attention has been drawn to the emphasis on constructivist perspectives about teaching and learning and the impact that technological advances have had on the role and responsibilities of academics. One of the major challenges for academic staff has occurred as a result of the intersection between this particular philosophical view and the increasing interactive capacity of communication media. The challenge is reflected by changes in educational practice and the need to engage students in active learning environments. The demand for innovation, new knowledge and technical skill is such that educators, with little or no history of online learning are now charged with the task of designing and developing authentic, effective, online educational experiences for a diverse range of students.

Although development in communication technologies have provided a stimulus for change and CMSs offer opportunities not available using conventional methods of teaching and learning, there is recognition that it is not the use of the technology that will affect change. This is evidenced by the fact that despite the use of different CMSs the development of online courses within CQU, has involved converting traditional content into a screen based format. A number of additional factors also impacted on the academics' ability to appropriate and transfer pedagogical knowledge and skill. These include knowledge and awareness of the social and technological context of learning as well as individual characteristics.

Next year CQU will implement Moodle 2.0 which will deliver a wide range of new features to Moodle users, but will also necessitate significant changes such as how files stored in Moodle are managed. Thus far academics have been unable to reap the potential educational benefits from previous CMS technologies. In order to do so further institutional, pedagogical and technological support is required.

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