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46.   CREATING THINKING PROFESSIONALS: TEACHING AND LEARNING ABOUT PROFESSIONAL PRACTICE USING INTERACTIVE TECHNOLOGY

BACKGROUND

On-line role-play technology symbolizes achievements of using computer-mediated tools and techniques in the delivery of higher education. Educators have long been aware of the potential power of role-plays in promoting the development of professional skills, knowledge and attitudes (see Bell, 2001). With the rapid growth and incorporation of Information Communication Technologies (ICTs) within teacher education courses, it is not surprising that arguments are being mounted that call for the introduction of benchmarks or universal standards in designing and delivering on-line education at universities (Cohen and Ellis, 2002; Oliver and Herrington, 2003).

There is increasing evidence that ICTs "are having an immense effect on academic practices and expectations of students about the place, time and nature of their learning" (Kulski *et al.* and 2002, p. 1). Within this background, the Creating Thinking Professionals (CTP) Project was initially conceptualised as a role-play simulation to be delivered through a Web-based interface to support an undergraduate degree program for early childhood educators at an Australian university. Specific aims and educational objectives of the CTP Project included:

- To enable students to engage in critical thinking when relating to professional issues/concerns within everyday contexts;
- To enhance teaching and learning of key professional concepts through problem based learning strategies which allow students access to meaningful contexts as if they themselves were direct participants in the ongoing dialogue; and
- To facilitate better access and understanding about critical debates in the field though real life scenarios encountered by early childhood educators.

The ICT platform required to run this simulation was located in an interactive Website that was powered by role-play software developed by Fablusi Pty Ltd. The inbuilt design features of the Fablusi platform (see Ip, Linser and Naidu, 2001) matched the objectives of the CTP Project and enabled the generation of a role-play simulation tailor-made for those training to become early childhood educators. The design features of the Fablusi platform of particular interest to the CTP Project included its capacity to:

- deliver an authentic and active narrative for early childhood educators which was both engaging and entertaining;

- ensure anonymity for learners through the provision of role specific and unique user interface contained within the Project Website;
- engage multiple groups of learners (or players) simultaneously and therefore be cost and time efficient;
- scaffold and replay content at any stage, and thereby enhance the potential for learning through systematic and continuous reflection.

These characteristics meant that by using the Fablusi role-play software we were able to create not only a relevant and meaningful simulation for early childhood educators, but it also enabled us to retain the problem based learning approach of the CTP Project. Accordingly, we used small collaborative groups to facilitate on-line learning through peer socialization. In environments where there are constructivist frameworks for problem solving activities, reflective dialogue, taking time for it to occur, and student initiatives are all valued (Wilks, 2004, p. ix).

Called 'A Different Lunch', the on-line role-play, simulated a professional dilemma that took place at a fictional childcare centre. The idea was that students would play the role of one of ten key characters involved in the scenario presented through a virtual environment very similar to the real world. The learning objectives of the simulation were pre-defined and available to the players (ie, students), who were required to create strategies to reach these objectives by interacting on-line with the other characters in the role-play. The accompanying narrative placed on the specially designed Website for 'A Different Lunch' simulation included the following:

> *In this course, we have incorporated a new way of teaching/learning about leadership matters of interest to early childhood educators through the use of an interactive Website based around a dramatic incident in a child care centre called 'A Different Lunch'. This incident acts as the stimulus for an on-line role-play simulation involving children and adults associated with a community based child care centre. In teams of 3, students will assume the roles of the 10 key characters involved in the role-play dramatisation of this incident. By stepping into the shoes of another person, students have the opportunity to get in touch with the cognitive and affective domains of interpersonal interactions. That is, through their characters, students will activate their minds and hearts in response to the evolving storyline. In this way, we hope the role-play simulation will bring to life contextually based realistic teaching/learning opportunities encountered by contemporary early childhood educators.*

Most Fablusi simulations begin with a text-based start up scenario presented on a Website. One of the unique features of 'A Different Lunch' simulation however, was that the start-up scenario was accompanied by dramatic visual imagery written by the researchers to ensure the students would be engaged in a broad range of pertinent issues. In addition to the text-based narrative, a short video dramatisation of the critical incident, together with photographic images and voice-overs that provided a brief background narrative on each character, was also made available to students. The flexibility and portability of the simulation was enhanced further by capturing

the scenario and character portraits on a CD-rom that was distributed to students at the start, enabling them to revisit the scenario, at their convenience. Notations were placed on the Website to remind students about the use of the CD-rom as follows:

> *The scenario that you received on the CD-rom raises a number of issues and problems that can arise in a child care centre. The challenge confronting you is to identify and address the issues and problems from the perspective of your role and to deal with them creatively. For example, are there health and safety issues involved in bringing food into the childcare centre? However, it is just as important, to creatively explore other problems that you think are related to the issues raised on the CD-rom. You can do this by having your character create a problem for some other roles to solve (and this exemplifies the issue(s) you have in mind) and send them a sim-mail. If you are unsure about it run it by a moderator (using sim-mail) and we'll work out the processes required together.*

In order to maximise the learning potential of this simulation, particularly the communication and interpersonal skills required by early childhood educators (see for example, Jalongo and Isenberg, 2000; Jensen and Kiley, 2000; and Ebbeck and Waniganayake, 2003), trained actors were used in the video. In doing so, we hoped that the visual imagery – especially the physical appearance, dress and body language, would enhance the authenticity of the narrative and general production quality of the dramatisation.

Students, in teams of two to three, participated as one of the ten characters associated with the start-up scenario. The simulation was on-line and interactive for a period of three weeks. This meant that over 21 days, students played their roles on-line in response to the evolving story line. By playing the role of one of the key characters including a child, her parents, centre staff, management committee members, a government adviser and a newspaper journalist, students were able to discover multiple perspectives in responding to the same incident. In adopting a child's perspective for instance, students had to call on their knowledge of child development. Likewise, playing the roles of the parents and centre staff required students to consider ethical, legal and industrial obligations of early childhood educators as appropriate and applicable in real world contexts.

The CTP Project required students to access the role-play simulation Website daily. A training session on the use of the ICT tools contained within this Website was presented before the simulation started. Together with resources placed on the Website, there was sufficient visual imagery and text based information to bring to life each character to facilitate the role-play on-line. Resources such as on-line journal articles and government documents such as childcare licensing regulations and the UN Convention on the Rights of the Child, were hot-linked to the Website to provide easy access and support students to reflect critically and extend their knowledge and understanding about major debates of relevance to early childhood educators.

It is important to note that our simulation was delivered side-by-side with weekly lectures. In effect, the simulation replaced the conventional face-to-face tutorials/seminars.

This included the time involved in training students to use the ICT tools driving the simulation, preparing and playing their character roles and engaging in reflecting and reviewing the processes of learning. Our aim was to promote critical thinking about early childhood matters in a holistic way. This required students to examine their own and others' professional and moral behaviour and beliefs as displayed through their on-line characters. Their combined reflections and reactions directed the path of the role-play simulation – there was no set script to follow.

At the end of the simulation, all students were required to participate in a face-to-face gathering described as a 'community conference'. This meeting served two purposes. First, it provided a forum to discuss issues of relevance to the characters involved in the role-play. During this part of the community conference, students presented their interests and concerns as a position paper (see *reflective essay* assignment described later in this chapter). It was delivered *in character* by each of the key players, as if this was a public meeting convened by the center's management committee to resolve issues arising from the critical incident and as played out during the on-line simulation. Second, once the proceedings of the community conference were closed, the meeting became a forum for the debriefing of students and academic staff. The discussions during this debrief included problems, opportunities, costs and benefits of this teaching and learning strategy, and the nature of the experience that partici-pants underwent in using this on-line role-play simulation. Evaluation data rein-forced the importance of the community conference as an essential design feature that contributed to the overall success of our on-line simulation.

MEASURING STUDENT LEARNING OUTCOMES

Assessment requirements of the degree program were systematically incorporated into the Web environment to maximise students' interest and motivation in participating in the simulation. As McLoughlin and Luca (2001, p. 418) have reflected, few will contest the centrality of formal assignments in determining students' satisfaction with university courses. In our case, assessment consisted of reviewing and reflecting on both factual and conceptual knowledge and understandings about working as an early childhood educator in Australia, as well as procedural skills in participating in team work and using on-line resources.

There is sufficient flexibility within the Fablusi platform to vary assessment to meet the particular teaching and learning objectives of a given course of study. In our case, assessment consisted of both group and individual tasks and students were expected to:
- design and publish an expanded role profile on the project Website
- maintain a specified number of on-line messages within the Website
- write a position paper from the perspective of the character played by each team; and
- write a reflective essay – the only task assessed on an individual basis.

These tasks were primarily aimed at enhancing students' competencies in reflecting critically and working with others in collaborative ways – two essential dimensions

of an early childhood educator's every day practice. A brief description of each of the assessment activities, including the proportion of marks allocated, is presented next.

Expanded role profile (10%): Students were required to extend the profile of their character by taking into account their experiences within early childhood settings/organizations. They then published them on the project Website. These characteristics could be either positive or negative, and students had to act out the implications of their chosen profile throughout the simulation. The objective of the expanded role profile was to get the students to 'own' their character and recognise their rights and responsibilities as a stakeholder involved in the decision-making within the 'fictional' world of the child care centre they were about to enter. It also allowed other players to evaluate the characteristics of the roles and plan how they would approach and interact with them during the simulation.

On-line message output (15%): During the simulation, sim-mails and forum messages contained within the Website (restricted and accessed only by students and staff involved in this project) formed the primary method of communication between roles. Participants could also use 'chat' to communicate with other roles and a notepad to communicate with other team members involved in playing the same role. Sim-mail and forum messages constituted formal communication paths that were assessed while chat and the notepad were informal communication paths that were not marked. Only messages that were sent to other characters in the role-play were considered for assessment purposes. A minimum of 10 messages per team per week and a maximum of 25 was set primarily to make the tasks of reading, moderating and assessing manageable for the moderators and to ensure that the students had an appropriate work load in keeping with the course requirements. All formal messages connected with the role-play were accessible by the teaching team who performed the role of simulation moderators.

Position paper (20%): Each team was required to produce a position paper from the perspective of their assigned character or stakeholder role within the simulation. These papers were published on the Website at or near the end of the live simulation so that everyone could read these before coming to the community conference. In the position paper, each character had to identify three issues of concern arising from the evolving story-line and recommend changes to policy and practice that could be implemented to resolve the concerns arising at the fictional child care-centre. The topics to be covered within the position papers referred to early childhood practice and were set by the teaching team. These topics were: parent-staff relationships; staff-child relationships; centre staffing; centre management; food and nutrition; as well as media and public relations.

Reflective essay (50%): Students were required to independently think through underlying moral and ethical considerations of the simulated scenario and critically analyse the experience as a way of learning about matters of interest to early childhood educators. It was recommended that the focus of this discussion be based on, conflicting rights, social justice, or communication, as these topics are embedded within the professional practice of contemporary early childhood educators.

The first three assignments were posted and assessed on-line. Individual student's grades and marks were allocated via an excel spreadsheet that was linked to the

Project Website to minimise the manual handling and processing of assignments. In this way, the Fablusi platform has the capacity to provide progressive overviews of students' work and this, in turn, allowed us to identify changes in learners' understanding, commitment, reflections on their learning, and provide appropriate feedback. Using the just-in-time problem based learning model, staff were able to adapt on-going lecture content and learning activities in response to the developing dialogue throughout the simulation.

OUR LEARNINGS FROM THE SIMULATION

In discussing the effectiveness of using simulations in higher education programs, Cameron and Wijekumar (2003, p. 119) stated that:

> *Simulations have been found to significantly improve knowledge transfer (Kozma, 1992; White, 1994). This type of discovery-based learning using simulations has been shown to increase understanding of abstract concepts (Rieber, 1996) and increase student motivation* (Brewer, 1982).

In keeping with a constructivist framework, in our simulation, the students (ie, the learners) participated as "active agents in the process of knowledge acquisition" (de Jong and van Joolingen, 1998, p.179). During the three weeks when the simulation was 'alive', any initial hesitancy with the use of technology – primarily concerned with mastering the different tools and resources available on the Website, soon dissipated as students became actively engaged in playing their roles. There were many students who were disappointed when the simulation ended and the 'game' had to stop due to coursework deadlines.

It has been further argued that "while the use of simulations in education has been studied for decades, its use in an on-line learning environment has not been widely explored" (Cameron and Wijekumar, 2003, p. 119). At the end of the course, an anonymous on-line evaluation instrument was administered through the Website to obtain objective feedback from participating students. Using this data, collected over two years with four groups of students who participated in the simulation, we now discuss key aspects of using on-line technologies in higher education realised through the CTP Project and consider implications for further research.

Those who have experienced the benefits of on-line education such as Cameron and Wijekumar (2003), King and McSporran (2002), and McLoughlin and Luca (2001), have tended to favour constructivist frameworks where the authenticity of the narrative, group work, learner control and scaffolding of knowledge are emphasised in the design and delivery of the teaching and learning. As Oliver and Herrington (2003, p. 112) noted:

> *The strength of constructivism as a theory of learning lies in its description of learning as a process of personal understanding and meaning making which is active and interpretative.*

Having adopted a constructivist approach in our simulation, we asked students to rate its usefulness in terms of:
• knowledge and understandings they had gained in relation to professional practice matters of interest to early childhood educators, and
• overall learning benefits of having participated in the CTP Project.
The findings from the evaluation related to four topics on early childhood issues are presented in Figure 46.1.

The development of sound partnerships between parents and professionals is central to the work of early childhood educators (Anning and Edwards, 1999; Ebbeck and Waniganayake, 2003; Jalongo and Isenberg, 2000; and Jensen and Kiley, 2000). Our simulation contained a variety of opportunities for students to interact with each other as either parents or professionals depending on the character allocated to each team. Through the simulation students were able to "practice skills, explore sensitive issues, expose behaviours and sensitize participants to other ideas, attitudes and values" (Bell, 2001, p. 256). As can be seen in Figure 46.1, on all four areas of early childhood practice identified, the majority of students rated the effectiveness of the simulation as being either high or very high. These findings augur well in supporting the use of on-line simulations to promote understanding about content, skills and values relevant to early childhood educators.

We acknowledge, however, that a minority of students rated the effectiveness of the simulation as either very low or low as shown in Figure 46.1. One possible explanation for this finding is that some students may have found some matters emerging from the simulation concerned with either parent – staff relationships or human rights issues for instance, either too abstract or complex due to language barriers or personal attitudes and belief systems. Variations in learning styles associated with
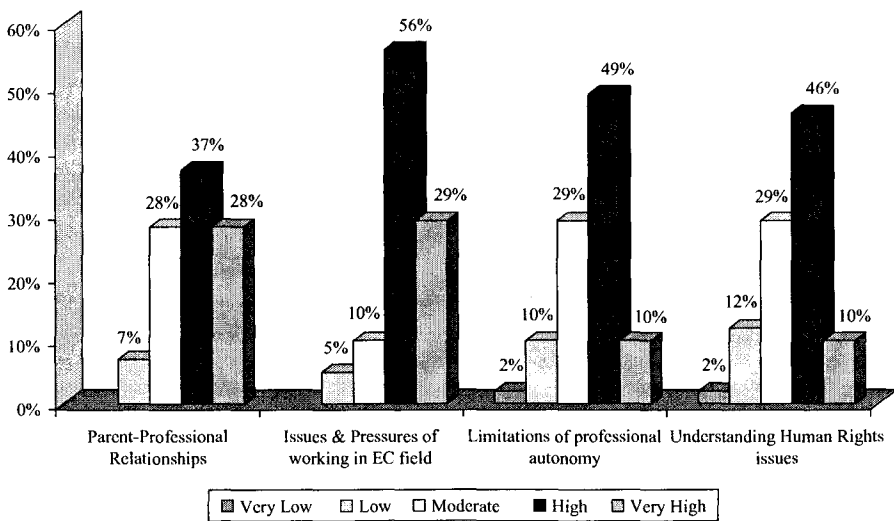

Figure 46.1.   Effectiveness of the simulation in learning about early childhood matters

participants' diverse cultural backgrounds, English language proficiency and compe-
tence in using technology can also influence both learning outcomes as well as the
overall engagement in the simulation – especially the smooth flow of the interactions
(Bell, 2001; Johnson, 2001).

It would also be useful to find out through any future simulation whether perceived
effectiveness of the simulation is related to the assigned character or the specific
roles students played. For instance, Bell (2001) raises questions about role engage-
ment in terms of students' cultural values and beliefs. In our simulation, although
cultural diversity and human rights concerns were integral to the storyline, available
data do not shed any light on the extent to which students found it easy or difficult to
play the role of someone from another cultural background. It is also possible that
role engagement could vary according to learners' interests as well as competence
and awareness of options available to the same characters in the real world. For
instance, dealing with the media and managing public relations is a relatively new
area of professional practice for early childhood educators (Ebbeck and
Waniganayake, 2003). Students' feedback suggest that whilst some were keenly
interested in playing the role of the journalist in our simulation, others were less
comfortable in this role due to the lack of first-hand experience of working with
the media.

As discussed earlier, critical thinking competencies are also reflected in the
integrated assessment requirements incorporated into the simulation design. As
McLoughlin and Luca (2001, p. 421) wrote:

> *It can be argued that the move towards authentic assessment paradigms
> has been accelerated by technology with its capacity to cope with a
> broad array of activities, tasks and forums for collaboration, dialogue
> and student-centred learning.*

McLoughlin and Luca's sentiments are also supported by evaluation data derived
from the analysis of the overall benefits of our simulation, and are depicted in
Figure 46.2. When the data on those who used the ratings of either 'agree' or
'strongly agree' are taken together, Figure 46.2 shows that almost three quarters or
more of the students supported the use of the simulation in terms of increasing
interactions with peers (ie, 80%), overcoming space and time limitations of studying
at university (ie, 73%) as well as in helping students to organise large amounts of
information (ie, 85%) and providing a holistic approach to learning (ie, 91%).

Figure 46.2 also shows that one of our design assumptions concerned with pro-
moting interactions between students and academic staff was not fully supported by
the data collected. That is, almost half the participating students (ie, 43%) did not
believe that the simulation had enabled them to relate better to us as their lecturers.
This finding surprised us because as the simulation moderators, academic staff was
always accessible to students on-line. However, it must be noted that we did not have
a direct role as characters in the role-play. Moreover, our role as moderators during
the simulation and as lecturers outside the simulation was perhaps not easily distin-
guishable. These factors may have influenced the nature of interactivity between
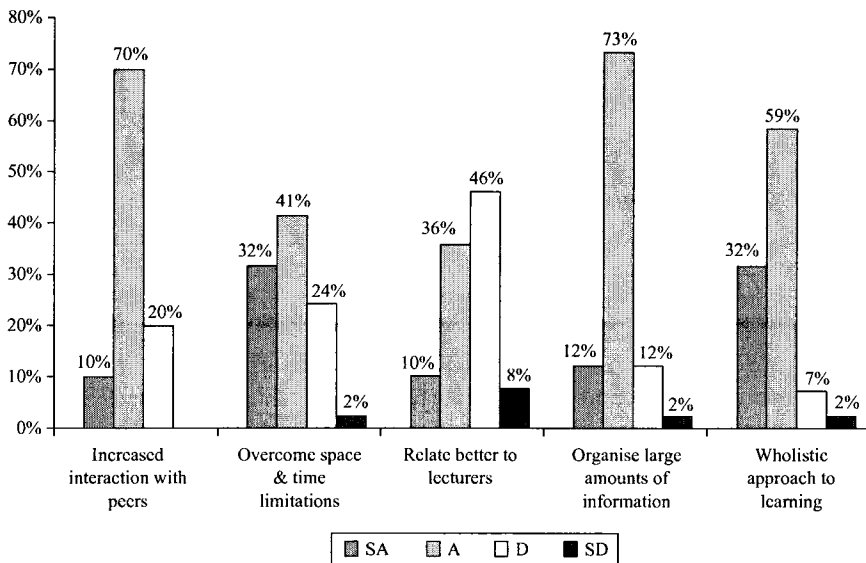
Figure 46.2.   Overall benefits of the simulation

Note: SA = Strongly Agree, A = Agree, D = Disagree and SD = Strongly Disagree

students and us. Most of the initial interactions between moderators and students, though clearly not all, were concerned with the provision of technical support and clarification of course requirements. As such, this may have impacted on students' perception of the role of lecturers, particularly during the later stages of the simulation when students were competently and intensively engaged in the role-play. Broader concerns such as authority relations in the learning process reflected in these findings cannot be easily de-aggregated in this data set and have been addressed elsewhere (see Linser *et al.*, 2004).

Notwithstanding the feedback on teacher-learner interactions, there is strong evidence that the simulation allowed increased communication between peers and enhanced a sense of community among the players. Virtual communities, such as that which was created within our simulation, are in essence designed specifically to bring together those separated by geographical locations and time zones. The overall design of our simulation reflected a global classroom where students had easy access to diverse and boundless resources across the Internet. It has also been shown that "... networked communication has increased the parameters of what is known as a community" (Palloff and Pratt, 1999 cited in Johnson, 2001, p.51). Participation in our type of role-play simulation can facilitate a sense of a learning community because the emphasis is placed on "process development over market or product development" (Liedka, 1999 cited in Johnson, 2001, p.46). In our case, the learning community that emerged from the interactions on-line, saw the students relating to one another as stakeholders of a childcare centre community – an authentic learning environment, familiar to contemporary early childhood educators.

Our simulation also offered multiple channels of expression and connectivity with and between peers as well as academic staff. Johnson (2001, p.46) commented that:

> *In the past few years, group work and collaboration using on-line environments has become an important research topic because of the interconnectivity enabled by the Internet, and more specifically, the World Wide Web (WWW).*

He went on to say that "on-line groups are usually self selected, rather than being true random selection in an experimental design" (Johnson, 2001, p.52). In our simulation, team membership was mostly randomly selected on-line. However, being in their fourth year of study at the university, many students were either friends or were at least aware of each other. The extent to which these factors impacted on promoting and/or hindering collaboration is difficult to know. Qualitative feedback from the participating students revealed that players knowing each other prior to the simulation contributed to successful negotiation over differences of opinion and in determining operational strategies on how to play the game. This pattern is supported by others who note "collaboration was richer among students who knew each other" (Oliver *et al.*, 1998 cited in Johnson, 2001, p.55).

Issues pertaining to safety on-line was another key consideration raised through our simulation. At one level, privacy and confidentiality of individuals within the simulated world itself led to concerns about who can get access to whose material during the simulation. For instance, security difficulties may occur especially in terms of the authentication of learner input. The initial registration process contained within the Fablusi software system, however, enabled us to keep track of an individual's on-line input throughout the simulation. Others have also raised concerns about the permanence of messages posted on-line (see Bell, 2001 and Johnson, 2001). The Fablusi software resolves this issue by keeping all simulation-based messages securely stored on the system as well as by providing output in un-editable CD-rom format.

Although it did not seem to be an issue in our project, it is important to keep in mind that some studies have shown that "lack of trust resulted in individual work with little collaboration, worker dissatisfaction and team attrition" (Johnson, 2001, p.50). In our case, however, the promotion of skills and understanding about working collaboratively was deliberately built into the simulation design to enhance the authenticity and application of learnings derived from the CTP Project (Waniganayake *et al.*, nd).

IMPLICATIONS FOR FURTHER RESEARCH

Analysis of the data derived from this study, whilst adding to the body of literature on the use of on-line simulations in higher education, also underscores the importance of continuous professional development for staff in the design and implementation of technology driven education programs. The rapid pace of advancement in on-line teaching tools and techniques demands the upgrading of both human and technical resources. Institutions need to allow for these matters to be systematically built into

their operational plans in order to harness the rich potential being offered by modern technology. Accordingly, we put forward three issues that warrant further investigation in promoting the use of on-line technology in higher education.

Role of the on-line teacher

As academic staff, we play many roles: teacher, coach, instructor, mentor or a facilitator, administrator and others. In our project, both students and staff shared responsibility for keeping abreast of the products of learning emanating from the simulation. Oliver and Herrington (2000 cited in Johnson, 2001, p.55) comment that the "content of asynchronous discussion can become poor and superficial without coaching and scaffolding". This is particularly important because the volume of information generated by an on-line simulation can be large and complex. Multiple perspectives generated by having ten stakeholders in the simulation may also have implications for cognitive overload for the learners (de Jong & van Joolingen, 1998, p.195). When taken together with Bell's (2001, p.11) concerns about "what are the appropriate participants numbers and time-frame" for an on-line simulation, these matters signify the need for further investigation and close monitoring during any subsequent simulations of 'A Different Lunch'. Similarly, when and how best to scaffold learning that emerges during on-line simulations remains a continuing challenge.

Other researchers have raised the need for educators to be adaptable in embracing new technology in order to be successful in porting teaching programs to the on-line environment. "As the growth of this area explodes, we must examine the pedagogical strategies that can be used for on-line teaching" (King and McSporran, 2002, p.49). Adaptability issues are, however, deep seated – some hate change of any type, and others fear technology in part because of the ease of accessibility and transparency in making the information available to large audiences. Nevertheless, as King and McSporran (2002) have eloquently argued, the aims of teaching, regardless of how and where, either in-person or on-line, are the same. Given the importance of the instructor's interpersonal skills to engage in any type of teaching, King and McSporran (2002, p.53) concluded by declaring that "on-line teaching demands hands-on commitment". As moderators, this demand was clearly borne out by our simulation experiences. (For a full discussion on the role of moderators in on-line simulations see Linser *et al.*, 2002.)

Methods and tools used in on-line education

Whilst there is some consensus about the principle of direct contact in promoting better learning, there is no agreement about the strategies and/or the mix of methods and tools that could be deployed in delivering on-line education programs.

Fischer (1998) states that face-to-face contact is essential for rapport. Hammond (1998) makes a case for multi-modal learning, that is, face-to-face mixed with asynchronous learning. According to Borthick and Jones (2002), synchronous environments provide a better learning environment than either asynchronous environments or traditional classrooms (cited in Johnson, 2001, p.56).

In our simulation, we used all these methods: forums, published presentations and sim-mail provided asynchronous contact, whilst 'chat rooms' within the Website made possible synchronous text communication. Apart from the pre-simulation training sessions as well as the community conference at the end of the simulation organised by the academic staff, most face-to-face contact between students occurred spontaneously or by arrangement, at their convenience. We did not however evaluate the merits of each of these communication strategies as a separate entity.

One cannot also ignore the finding of others who state "the lack of face-to-face contact in text-based communication tools can actually be an advantage because this environment suppresses traditional group norm behaviour" (Johnson, 2001, p.56) and instead promotes diversity and creativity. To what extent is face-to-face contact necessary or essential in promoting collaboration and learning? If face-to-face contact is essential, then what is the nature and frequency of this type of connectivity that is required to optimise learning? "Others argue that no single design or perspective is adequate for the design of technology enhanced learning environments" (Sfaard, 1998 cited in McLoughlin & Luca, 2001, p.418).

Another point of consideration is, to what extent does the on-line input have to be supplemented by other technological tools such as Web-based audio and video conferencing? For instance, in our case, the scenario that was the stimulus for the simulation was presented to the students in the form of an audio-visual dramatisation not simply as a text-based situation as in the case of other on-line simulations. Collis and Moonene (2001 cited in McLoughlin and Luca, 2001, p.419) "conclude that while learning gains cannot be proved, they still remain optimistic about technology integration" into university based teaching and learning. An experimental study has to be put in place to compare and contrast the adequacy of learning outcomes derived from deploying different methods and tools in on-line simulations. Until such time, we can only state that technology offers more options or multiple channels for expression and engagement in information processing by both academic staff and students.

Quality assurance of on-line education

It is possible that as the demand for and popularity of on-line training expand, the interest and use of role-play simulations may increase. It seems that university wide application of on-line education programs are being linked together for benchmarking purposes (McNaught *et al.*, 1999; McNaught *et al.*, 2000; and Oliver, 2001). As the attention on university-based on-line education intensifies, McLoughlin and Luca (2001, p.425) ask, "Will technology be able to meet the future challenges of the quality assurance agenda?" They advocate an approach where student involvement in knowledge construction is emphasised and benchmarks with clear expectations that reflect real world living are established.

Existing studies within different disciplines such as computer science (Cameron and Wijekumar, 2003), education (Bell, 2001), political science (Linser, 2004), and engineering (see de Jong and van Joolingen, 1998) clearly demonstrate the variable uses of on-line role-play simulations to promote skill development in diverse

professions. There is strong evidence to suggest that one of the key indicators of success in using simulations is their capacity to motivate learners by simulating authentic learning environments (Orbach, 1979 cited in Cameron & Wijekumar, 2003, p.118). When looking at commercially available simulation packages, it is therefore important to assess their flexibility and capacity to meet the goals and objectives of a specific training program. In our case, the Fablusi platform had the capacity to emulate real world operations within the context of an organization such as a child care centre, a primary employer of early childhood educators. Those such as Collis (1997) reiterate the importance of 'pedagogical re-engineering' when using on-line technology, so that course content is revised to meet the learning objectives instead of repackaging content simply to fit a given form.

Oliver and Herrington (2003, p.111) contend that although much effort, enthusiasm and time are dispensed in developing on-line education packages, "too often the opportunities and advantages of the use of technology in the learning process are poorly exploited". On the other hand, there is also concern that pressure on academic staff to "master new technology" by developing and extending their on-line skills can become overwhelming (Atkinson and Brown, 1997 cited in Kulski *et al.*, 2002, p.2). In writing about the evaluation of the introduction of a university wide on-line learning system at RMIT University, McNaught *et al.*, (1999, np) stated, "Staff workload is a critical issue " and called for "more local support for staff and students".

To ensure excellence in quality in on-line education, provision of continuous training and timely assistance to both academic staff and students must be guaranteed. This view is supported by those such as Bennett *et al.* (1999) and Kulski *et al.* (2002, p.1) who highlight the importance of establishing "institutional support structures to cater for the emerging professional development needs of their academic staff" and outlines the benefits of adopting a "strategic approach to centralised support" for all concerned – the institution, the staff and the students.

CONCLUSION

Much of the current literature on on-line teaching and learning relies on the discussion of case studies of interventions launched at various higher education institutions such as ours. The extent to which one can generalise and debate the potential of on-line learning based on these findings is somewhat limited because of the contextual variables particular to each case study such as the CTP Project. With the growing interest in developing standards and benchmarks for on-line teaching and learning (Cohen and Ellis, 2002; Oliver and Herrington, 2003) it is also possible that the richness and creativity contained in the case study designs of on-line education could be lost.

Just as much as the imposition of a system-wide curriculum can stall or stymie the advancement of classroom practice, it is also possible that top-down bureaucratic standards that force academics to converge their on-line designs around a single platform could thwart initiative and experimentation with diverse technology and enthusiasm to learn from meaningful experiences. Herein lies the danger that standardisation could constrain the potency of constructivist principles that has

driven much of the on-line learning revolution to become nothing more than mere rhetoric. Likewise, as our findings suggest, the impact of on-line education on the teacher-learner relationships require critical review and reconceptualisation. For instance, if the current trend in learner centred pedagogy continues to direct on-line education, is it possible that technology could eliminate the need for academic instructors all together? Large scale evaluations of on-line role-play simulations sustained over a period of time are needed if we are to strategically plan and address major dilemmas such as these which can change the nature of higher education as we know it today. As educators, we need to go beyond the technological advances of today in planning for pedagogical improvements of tomorrow.

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