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**Integrating Learning Technologies with Experiential Learning in a
Postgraduate Teacher Education Course**

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Integrating Learning Technologies with Experiential Learning in a Postgraduate Teacher Education Course

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Abstract

This paper discusses how a Postgraduate Certificate Course in Third Level Learning and Teaching for academic staff in the Republic of Ireland has adopted a particular approach in teacher education. As an important aspect of the successful integration and use of learning technology is the way in which it effectively reflects and articulates a given learning model, this course has its theoretical basis on the Kolb Experiential Learning Cycle (Kolb, 1983). The work illustrates that no one technology can support all types of third level learning and teaching; an effective approach is to combine a range of technologies. The self-study focuses on analyzing key experiences regarding the integration of a variety of learning technologies available in higher education today, in an effort to determine how the teacher educator's role can plan for effective integration of technology into the curriculum. Subsequently I hope to translate what I learned from this self-study to assist the course participants with some of the integration issues they, in turn, will be dealing with as they move towards

incorporating more learning technology into their own subject disciplines. Part of the ethos of the course for the course tutors was the wish to experience and model what we advocate to our own participants. Ongoing research will be outlined to measure the impact of this.

There is no professional training requirement for higher education teachers in the Republic of Ireland as far as their teaching is concerned. However, there is growing recognition within the sector for the need for training for lecturers and other academic staff who have a teaching component to their work. With the many demands on the time of today's lecturers, there are recommendations for a progressive shift from formal, institution-bound teaching to technology-facilitated learning (Skilbeck, 2001). With the advent of technology-rich teaching on a large scale, there are now many new opportunities for creative and innovative teaching and new relationships both with students and the shifting world of knowledge. A main question remains – are academic staff motivated and adequately prepared to take advantage of the opportunities?

This Postgraduate Certificate in Third Level Learning and Teaching course is aimed at such academic staff in higher education institutions in the Republic of Ireland, including lecturers, librarians, and academic support staff. In higher education, it is important to encourage teaching that develops critical and independent thinking in its students and research that informs the teaching process and it is proposed that this course is an important step toward these goals. An overall goal of the course is that it acts as a catalyst within the

various institutions represented, encouraging these lecturers to reflect on all aspects of the learning and teaching provision, including the integration of learning technology; by spreading this on-the-ground enthusiasm, the goal can be achieved by the management of the higher education institutes supporting the implementation of learning technology in current teaching practice.

This self study relates to others in the field in that it is aimed at the preparation of educators in teacher education programs in colleges of education and includes a vision of these teachers as architects of new directions for today's learning technologies as essential tools for teachers. To use these technologies responsibly and humanely, teachers need to understand their potential, have opportunities to apply them, be supported in their explorations, and have time to experiment. Equally important, they need to acquire dispositions to recognize and acknowledge technology as more than a tool for teaching and learning.

It was anticipated by the course team that over time those who have completed this course would have a positive impact in higher education in the Republic of Ireland by modelling good practices in teaching that enhance learning, and by generating increased interest in teaching and learning within their own departments in their various higher education institutes. It had been envisaged that this could be achieved by aiding the lecturers on the course to better manage the media mix and range of learning technologies (LT) available in higher education today. The paper will conclude with a discussion of current qualitative research conducted to establish if this vision has actually begun to take shape.

Context and Rationale for the Course

This Postgraduate Certificate in Third Level Learning and Teaching Course is located in the Faculty of Academic Affairs in the Dublin Institute of Technology (DIT). It was initially offered in 2000, and is continuing apace today, with 65 academic staff having successfully graduated from the course to date.

In the context of the course, learning technology (LT) means the incorporation of educational technology to help support a broad range of teaching and learning activities: on-campus or off-campus, scheduled or asynchronous interaction and communication – all with a learner-centred focus. From the outset, it was recognised by the course team that different learning technologies would not be fully integrated into the curriculum of the academics on the course in their higher education institutions in Ireland unless they came to believe in it. It was vital to present an integration of relevant theory and practice to support the staff in this transition.

Fullan (1993) maintains that a high quality teaching force, always learning, is the *sine qua non* of coping with dynamic complexity; there are no substitutes to having better teachers. It is all about making the career-long continuum of teacher learning a reality. There are scores of unqualified teachers in third level (higher education) in the Republic of Ireland, who are required to learn on the job. The course is offered to appropriate staff of universities and institutes of technology in the Republic of Ireland. This is in line with the

recommendations of the Colloquium on University Teaching and Learning held in Dublin in December 1998. Their recommendations included one which sought “*to facilitate further inter-institutional collaboration in development of a core curriculum for the professional development of staff*” (Colloquium, 1998, p. 20).

Phillips suggested in 1998 that many academics still had limited experience of such learning technology for teaching and learning and lacked familiarity with current thinking in educational technology. In 2000, Anstey posited that academic staff were still adhering to the use of the WWW for more passive and didactic forms of teaching and learning. Despite the growing discussion of ICT development at university teaching levels (Skillbeck, 2001), even today, there are still numbers of academic staff in higher education in the Republic of Ireland who would not be comfortable with integrating such technology into their teaching and learning. By offering continuing professional development to academic staff through this course, these teachers could gain the skills and knowledge required to incorporate new teaching methods, and integrate relevant technology within their own courses. The focus of this paper is to draw a parallel with how this corpus of knowledge has contributed to the development of this course.

During the last decade of the millennium, in countries throughout the world, a considerable amount of effort and expense has been spent on teacher education relative to computer related technologies. Courses and training relative to teaching and computers have involved large numbers of teachers in Europe, North America, Australia, and throughout the rest of the world including developing countries. Collis (1994) has argued that there has been little

substantial symbiosis between the educational technology and the teacher education communities. Comprehensive data on the educational use of computers as instructional tools within teacher education internationally has been limited, but it has shown that the opportunity for pre-service teachers to experience models of computer supported instruction before they try to manage it themselves is seldom available (Collis, 1994).

The design and implementation of this course has been contrary to this. The design focus was on the importance of fully integrating the use of LT within the experiential model of learning on which the programme was moulded, taking full account of the programme aims and objectives, assessment strategy and issues of student motivation. This Postgraduate Certificate Course on Third Level Learning and Teaching for academic staff has fully integrated a range of learning technologies to teacher education and the LT education has been stimulated and delivered by tutors with an academic background in teacher education themselves.

Role of Course Team

The course team of four educational developers (course tutors) were responsible for designing and moderating this course. Team teaching figures strongly in the moderation of the course, as a Centre, we favoured teacher collaboration and collegiality, and it is an area that we wished to promote to the teachers who came on the course. We agreed that it was important to bring a variety of perspectives to the subject under consideration. All tutors are jointly responsible for course content and assessment. However, they take turns presenting

material appropriate to their individual areas of specialization. Careful planning is essential, and this approach depends for its success on the compatibility and mutual respect of those involved.

Course Design Process

The emergence of new learning technologies – multimedia and telecommunications – are presenting new challenges and opportunities to teacher education, and it was a strong wish of the course team to make use of them. Just as the teacher may no longer be able to be considered the primary source and organiser of his or her students' learning in the information society of the 21st century, neither may the traditional teacher education courses be able to adequately provide or control teacher education.

While mixtures of new media can offer significant opportunities for course participants, this can also be a daunting hurdle for newcomers, such as the lecturers who were participants on this specific course. The design challenge presented by this course was to enable the course participants to feel comfortable with using a range of learning technologies and replicate that in their own teaching practice in their own subject disciplines.

There are a number of key lessons learned from the process of designing and implementing this course.

What Worked!

As stated, part of the ethos of the course was ensuring that how the course is taught is a means of modelling for the participant's own teaching. It was vital to promote best practice in the design, integration and use of LT to the course, so that the participants (academic staff) in turn could apply what they had learned to their own teaching situation for their own students.

From the outset, the course design team were concerned with the issues of pedagogical use of learning technology and its practice. Pedagogically, design issues centred on whether the integration of the learning technology would make the participants' learning more accessible and whether it would promote improved learning. Participants were very aware of any effective integration of learning technology calling for substantial thinking and rethinking of their curricular and educational practice, and inevitably that time and effort must be expended when developing in their colleagues, a critical understanding of LT as a shaper of information and values.

Furthermore, discussions took place on using relevant LT to provide students with a variety of experiences and contexts to integrate their skills and knowledge both in and out of college. The rich potential of LT for enabling more effective learning was identified where it is subordinated to the learning goals of the institution and its critical selection is based on the needs and learning styles of students; only then can it be infused into the curriculum.

The LT aspects of the course had been designed with Constructivism as a focus. Times have changed and students now need to be able to think flexibly and creatively, solve problems and make decisions within complex multidisciplinary environments. The participants were made aware of this through the course and the need for integrating different instructional methods, techniques and strategies. They in turn, discussed the areas of student responsibility and initiative, generative learning activities, authentic learning contexts and assessment strategies, and co-operative support. Interaction is a critical component of constructivist learning environments, whether via the web or in person, because learning occurs in a social context through collaboration, negotiation, debate, and peer review.

The most popular component to the course to date has been the Online Journal Club using WebCT. Each week a journal article relevant to the face-to-face class is discussed by the participants in an online discussion board. In a three hour practical class session, there generally is not sufficient time for the moderator and participants to explore in any depth the theory behind the topic. By using this online opportunity, the dialogue in class is extended and deepened through these reflections. The participants are invited to respond to the online article through relating it to their own contexts, teaching practice, and experience.

In practical terms, a strategic view of the integration of ICTs to one's institution was not overlooked. According to Squires *et al*, (2000), if LT is to realise its potential, it must be integrated into the daily practice of higher education. For this course, how LT

developments could be aligned to wider institutional strategies was an area of consequence: the institution's own policy regarding LT was important. In its Strategic Plan, the use of novel pedagogies such as group work, online and problem based learning are encouraged. From this, it was felt that the LT developments in the Postgraduate Certificate would be aligned to the wider institutional strategies. However, the institutional constraints had to be borne in mind of working within the quality and quantity of hardware and software available, and the level of technical and other support which would be available.

The course has aimed to make its participants aware that introducing a new LT can be an exciting and rewarding project, but it also can be complex and time consuming. Not only does it involve them developing a range of new technical skills, it also requires that they become "expert" in a new way of teaching and their students become proficient in and enthusiastic about a new way of learning. At the same time, they may have to enthuse their colleagues in their departments about the benefits of adopting a particular technology.

Room for Improvement

Effectively integrating new technologies into learning environments is challenging under any circumstances. The major difficulty experienced by the course team was in working out the flow of introducing different technologies at different times. It was also important to ensure that introducing the range of learning technologies would not add to the participants' work burden on the course. A main issue which emerged was participant's level of familiarity with ICT. Their technical knowledge also forced the course tutors to re-evaluate

certain learning objectives early in the course. Most participants had extensive knowledge of basic computing packages; however, few had used web-based course facilities. The lack of technical knowledge hampered student interaction in the first phase of the course, with participants needing to quickly learn how best to use non-verbal communication tools. A common complaint early in proceedings was the limitations of participants without requisite skills not being able to communicate as effectively as they wanted to with their peers (e.g. online discussions becoming a one line, short answer advice session, rather than consolidated information sharing session). Course tutors therefore had to intervene to guide participants in ways to manage technology.

Course Evaluation

In 2003, full online course support was offered using the Online Learning Environment, WebCT; as recommended to course participants, taking small steps initially in the area will benefit in the design and implementation of a bigger system in the future.

In 2004 an evaluative study was conducted to retrospectively measure the impact of change in teaching practice for the teachers who have graduated from the Postgraduate Certificate in Third Level Learning and Teaching Course over a period extending from 2000-2003. Impact in this context is the difference that the course has made on these lecturers' professional practice as a result of the course they completed. One focus of this impact was that made by the integration of LT within the course. A qualitative questionnaire was distributed to the forty five successful graduates of the course to establish the difference that the course has made on these teachers' professional practice as a result of the course

they completed. These graduates were from mixed backgrounds in learning and teaching, some coming directly from industry with a minimum of teaching practice, whilst others had a wealth of teaching experience spanning several decades. They also came from a wide range of subject disciplines including: apprentice education in aeronautical engineering, joinery, sheet-metal work, bakery studies and electrical services engineering; undergraduate courses in architecture, physics, mechanical engineering, economics, visual communication, fine art, media studies, nurse tutoring, real estate management, legal studies, psychology, biology, chemistry, ophthalmology; and postgraduate courses in graphic design, hospitality management, business studies. Aspects of academic support services were also participants on the course including faculty librarians, career guidance officers and staff development IT trainers.

Twenty five teachers returned completed questionnaires; all indicated that impact had been made on their teaching practice, and a number of changes had taken place. The most significant of these had been increased reflection on current teaching practice; the introduction of new teaching strategies using learning technologies; increased focus on the design and delivery of classes, and integration of technology; an increased in confidence about learning and teaching and technology and a more student-centred approach taken to teaching.

As a result of this study, certain aspects of the course have been confirmed as strengths: all respondents indicated positively that having completed the course has had an impact on their teaching practice and eighteen provided evidence that their experience of completing

the course has had an impact on their students' learning. To counter the return rate on the questionnaire, two focus groups were held with twelve of the remaining course graduates to explore further this impact on practice.

A number of important issues were uncovered. Foremost of these were that the teachers still needed to focus on making a difference with individual students, but they must also work on department-wide change to create the working conditions that will be most effective in helping all their students learn. They appreciated the need to look for opportunities to join forces with others in their departments, and realized that they are part of a larger movement to develop a learning society through their work with students. Ultimately it is only by these individuals taking action with the learning technology to alter their own environments that there is any chance for deep change therein.

It is necessary for the course tutors to continue to evaluate if the course is focusing directly on developing the beginner and experienced teacher's knowledge base for integrating learning technology into effective teaching and the knowledge base for making changes in the conditions that affect teaching. We need to keep asking ourselves: "are a large percentage of these educators thoroughly grounded in the knowledge and skills required to bring about meaningful change?" Goodlad (1991, in Fullan 1993, p119).

Technology and Experiential Learning

The course was designed with two modules, 'Learning and Teaching in Higher Education' and 'Designing Curricula and Assessment Strategies'. The following section of the paper will explain the practical aspects of how certain learning technologies available in higher education today are *fully* integrated into both core Learning and Teaching modules of the course. Practical details of the course being that each module is of 15 weeks duration, and the course participants meet for a face to face class session for three hours of each of these weeks. Independent learning is fully encouraged outside of this schedule.

The course was modelled on Kolb's (1983) Experiential Model of Learning which encompasses learning methods based on the experience of the learner. Relevance and application of learning are important features to this model. An aspect that influenced the adoption of this particular model was the fact that the next stage of the programme was progression onto a Postgraduate Diploma in Third Level Learning and Teaching. The diploma has Problem-based Learning (PBL) both as its curriculum design model and teaching/learning strategy. The certificate is participant-centred, and the experiential model is congruent with PBL being issues-based and embedded in the participant's real-life context. A conversational stimulus in both courses elicits participants' issues in third level learning and teaching.

The course outcomes regarding technology were for the participants to be able to select and use a variety of learning technologies that may be used to enhance student learning and to

be able to integrate and evaluate learning technologies in the context of their own subject area. As the course was designed to apply LT to support the learning and teaching process, some considerable time was spent looking at the best national and international practice in the area. By doing this, it was considered important to introduce to the course creative approaches to using the LT; comparing different media, discussing pedagogical and interface design, accessibility, participant attitudes and experience of learning technology, interactivity, assessment and evaluation.

Insert Figure One here

Concrete Experience

The learning in this teacher education course begins with the real experience of the lecturers in their role as teachers and facilitators of learning in their institutions. The participants' concrete experience of using LT needed to be taken into account and the technology then restructured around the participants. We were aware of the participants' current knowledge of LT through the introduction of a pre-induction session on basic IT skills. Early on in the course, there was time given for discussion of issues relating to the structure, objectives, content and delivery of teacher education concerned with LT, and also issues relating to the appropriate background for teachers delivering instruction in this area.

In the induction session for the course, the participants were asked what they themselves wanted out of the course (Hopes, Fears and Expectations) and these responses were used as the basis of the subsequent teaching and learning sessions and for integrating LT. They felt

strongly that the appropriate use of LT should release them from the high contact hours that they were currently having with their students, to enable more time to be spent in small group teaching, materials development, and research into their own subject disciplines.

At this stage, it was appropriate to consider and discuss the use of LT in terms of the way it would affect the conventional teaching situations that many of the course participants would find themselves facing. These areas were:

- How the LT would enable the learners to manage their own learning?
- How it could supplement or complement the existing lecture programme that many of them still used?
- How it would support working with large groups? (some of the course participants taught classes of up to 80 students)
- How it would support disparate ability levels?
- How it would enable small group teaching? (some of the participants had moved towards using problem-based learning tutorials in their sessions)
- How it would assist in acquiring key skills?

Reflection

The participants were facilitated to reflect on their experiences of teaching and learning to date, including technology, in order to make links between their reflections on practice and the theories and principles of learning and teaching. The idea was for them to be able to confirm their strengths, raise questions, improve their practice and innovate. This reflection

took many forms including, in the main, teaching portfolio work, which was the form of assessment for the module on Learning and Teaching in Higher Education; but the reflection step of the Kolb Cycle also concentrated on the participants working in pairs, taking part in group discussions, and the setting up and maintaining of online special interest groups. They were actively encouraged to reflect on any innovations in LT they were attempting for the first time, especially if it did not go according to plan; if problems arose, they reflected on what went wrong and why, in order to try again. Learners develop understanding through the medium of discussion, whether internal (as reflection) or external with peers and tutors.

Abstraction

The generalisation and abstraction took many forms including exploring web resources, investigating best national and international practice in order to benchmark their work, resource reviews and developing a personal practical philosophy. The participants were encouraged to ask questions about the theories of learning and teaching using technology from the viewpoint of their current practice. They also theorised from reflections on their own teaching practice.

As part of the abstraction step to the Kolb Cycle, in addition to Integrating LT, several other key themes in learning and teaching were integrated to the core modules. Electronic links were included on the Course Web Site to research papers on the themes of Equal Opportunities in Higher Education, and the Philosophy and Psychology of Higher

Education. These are added to each year by participants who discover papers that they find interesting and relevant. Throughout the duration of the course, the participants themselves were called upon to present case studies unique to their subject area. Several of these directly related to the use of a learning technology. A slot was reserved on each face to face session for a case study presented by a course participant on an aspect of their practice that was innovatory for them. There was an outlook on the course that much that could be learned about learning and teaching would come from fellow participants rather than solely through the conduit of the tutors; and this outlook was endorsed by the tutors themselves. Dissemination of all course materials, including the case studies was encouraged at all times; the newly formed web site would be used for this. It was to be a dynamic resource and the participants were strongly encouraged to submit their own work for inclusion on the site.

When introduced to new IT skills, academics may place emphasis on the technology, rather than course design issues, resulting in the production of learning materials offering little engagement for the student (Littlejohn, 2000). The participants were made aware of a number of learning theories from the area of educational technology. One that found favour was the 4 E-Model (Collis *et al*, 2000); the four areas explored were Educational Effectiveness, Ease of Use, Engagement (student self-confidence in using LT) and Environmental (the need to choose an appropriate system for the educational context).

As the Active Experimentation step of the Kolb Learning Cycle was where the main implementation of integrating LT to the course took place, this paper will discuss the step under the two modules of the course.

Active Experimentation in ‘Learning and Teaching in Higher Education’

Active experimentation was a major key to the learning in this module. Participants were invited to try out different ideas and methods in their own teaching practice. In this first module, Lesson Planning, Group Project Work and Interactive Teaching were among the areas where the technology was integrated to facilitate the participants to test out the application of their learning. Hereafter, is a description of the areas of learning technology that were integrated to the module syllabus, and which formed the bulk of the active experimentation step of the Kolb Cycle, and thus closed the learning loop for the participants.

The first session was held on the use of the lecture method, but in a non-traditional format. The importance of varying the format of delivery, using electronic presentation media for structure and clarity, but also introducing interactivity in the form of brainstorming and buzz group sessions were all explored. The web sites they reviewed varied in detail, and the combined objective of the exercise was to make the participants aware that having access to the Internet can provide vast resources for conducting research and the usefulness of the individual sites for reviewing a specific topic.

The use of electronic presentations were a popular element of the new learning technologies amongst the course participants; the theory of learning how to design and deliver lectures effectively using software such as Microsoft Powerpoint, was not enough in itself. The participants needed to obtain feedback on the results of their efforts using the media, and this took place in a series of three microteaching sessions. The participants were divided into small groups of four and encouraged to give a brief minute presentation to the remainder of the group (including two course tutors) on any aspect of their teaching using this new media. The presentations were videotaped. Afterwards they were able to review their presentation and obtain constructive feedback from their peers. The feedback included positive as well as developmental feedback from all in the group. This enabled the participants to experiment and take risks with technology that previously may not have been familiar to them in a friendly and supportive environment; the way was then more open for them to use the technology in real classes in their departments. Other Audio Visual Media available for the participants to experiment with in the Microteaching Sessions were electronic whiteboards for group work, interactive smartboards, and visualisers.

Real-time or time-independent communication can take place among learners and staff within and between institutions. In a session on Effective Group Work, Computer Mediated Communication (CMC) software was discussed and demonstrated. In the area of interactivity, three aspects were explored and discussed: the student to student interactions, the student to instructor interactions and the student to resources interactions.

This was important as the Web is now causing educators to re-think the very nature of teaching and learning. Claims have been made that the Web can free teaching and learning from the physical boundaries of classrooms and time restraints of class schedules. Traditional lectures and demonstrations can become Web based multimedia learning experiences for students. Learning resources of the college and university can be augmented by learning resources of the world via the Web. Overall, web-based instruction enables greater individualisation and flexibility, creating an increased demand for self-directed learning.

Active Experimentation in ‘Designing Curricula and Assessment Strategies’

The second module on the course focused on designing of curricula and assessment strategies. As the main assessment of the module was in the form of a group project, there were several opportunities to seamlessly integrate various learning technologies. The participants were introduced to Online Group Discussions, through WebCT. They were encouraged to set up Discussion Boards to be used as a forum to discuss their module group project proposals and full group projects at each project milestone. The participants in the groups were all located at different campuses and the Group Discussion Software gave them an opportunity to continue their group work at times when it was not convenient to meet up face to face. A full session was then devoted to integrating technology into the curriculum and discussing different modes of delivery and it drew together many of the learning technologies that were alluded to in previous sessions to allow the participants to have hands-on experience of them.

Another session was devoted to Supporting Assessment with technology, and specific software was used as the basis of that. A range of current software available within the institution and elsewhere in the marketplace were demonstrated to show that the technology can provide the potential for learners to receive immediate feedback and for course tutors to carry out rapid and continuous assessment, specifically 'Respondus' linked into WebCT.

Evaluation was a session which included a first step evaluation of CD-ROM based Computer Assisted Learning (CAL) software, as well as what is currently being delivered via the WWW. For all web sites that the participants' attention was drawn to in all the sessions, a number of review criteria were set for evaluating the sites.

Initiating the Process of Change

The aim of this work has been to change my practice through continually adjusting my teaching activities to improve my interactions with others involved in this course (colleagues and course participants). It has been relatively recent since I asked myself if I have been living in the direction of my educational values (Whitehead, 1989). These are my ideas about what constitutes an educationally worthwhile process of teaching and learning by defining the relationship between knowledge, teachers and learners.

My professional role involves the provision of academic support for lecturers at the Institute. I felt there was a discrepancy between what I felt should be happening for these

teachers in terms of access and experience of learning technology and the reality of the provision. As a teacher educator engaged in this self-study, I am concerned with the consistency not only between my intellectual goals and my practices and participant outcomes from the course, but also between my values and my practice.

The experiences of tutoring on this course and the resultant opportunity to study my own practice, within my own institution, and indeed my own pedagogies, has led me to believe in the benefits from breaking free from previous ways of thinking about how to deliver teacher education. My evidence emerged from an analysis of qualitative questionnaires from successful graduates on the course. When the course was set up initially, we experienced problems with integrating technology to the curriculum effectively, as documented, but, in the past few years our persistent efforts seem to have paid off in terms of participant involvement with learning technology in their own practices.

My claim at the end of this self study is that I now have a clearer picture of the problem areas in integrating relevant learning technology into a teacher education course. I am now in tune with the suggestion that people develop as reflective practitioners through critiquing their own work, and offering their personal accounts for public criticism. I have believed for some time that the idea of the teacher as researcher is of crucial importance for the future development of my professional practice. Since undertaking this study, my professional practice has since been transformed. I can now make another claim in that I know that I have improved in my role in tutoring using learning technology. I have developed a better pedagogic style, one that is open to further reflection and development,

and inclusive of the strengths of the academic staff with whom I work. Reflecting on my practice, and engaging with the existing theories in the literature of integrating learning technology to a curriculum in higher education, led me to the realisation that there was divergence between my values and my practice. I set about planning a change to my practice and developing my professional knowledge so as to synthesise my values and my practice. I further refined my ideas for writing this study.

As the study moved to conclusion, I have found that I have learned a number of lessons about working with teachers trying to integrate learning technology into their own unique contexts and practices. I feel that the kind of honest collaboration detailed in this study - with the participants included in the process - is powerful and democratic. I have begun a transformation of my own practice to collaborate with academic peers and together to form which direction we wish to move in learning and teaching with technology.

I have also discovered a number of lessons about myself and my professional role. At the outset of this work, I had hoped that undertaking this study would lead to my own personal development, to better professional practice and to improvements in the institution in which I worked. This is the stage that I now find myself. I can now see more clearly - through this self study process of reflection, action and evaluation - that my values and my practice were at odds. They are now more synchronised and, as a result, I feel that my personal and professional lives are also more harmonised. Consequently, I feel more confidence in my role as educational developer in higher education, speaking about the impact that learning technology can have on learning, if integrated and utilised effectively.

As my practice evolves, I am continuously learning. The knowledge that I have generated is laden with my values and permeated with my personal sense of what is just. By continuing on this road, perhaps a new set of challenges will be presented. If so, I can build on the knowledge I have gained from this study. Thus, the transformation of my learning from year to year will generate new personal, professional knowledge. This study is part of an ongoing process that I will continue to explore for as long as I work in teacher education. Making these experiences public, and thereby susceptible to critical review and evaluation, and accessible for exchange and use by others, I believe, has encouraged me to be more imaginative, creative, and productive in my practice, and possibly making a difference?

The Future

What questions does this course raise in terms of the future of technology in higher education? As we look to the future, we need to recognize that if higher education is to succeed and thrive, it must re-create itself appropriately, using new technologies. Technology is changing the way lecturers teach and students learn. As technological advances are introduced into courses in higher education, campuses are more and more attracted by the promise and potential of technology for enhancing access and learning. Teaching staff need to understand what technology can and what it cannot do. Some see technology as a critical complement to the educational experience, opening more opportunities for the learner. However, within this, we believe that episodic, bottom-up

experimentation by a few interested lecturers, while a necessary component of the transformation ahead, is not a sufficient condition for its success. Success will require wise institutional investments in scalable technologies and professional development methodologies. This course is one such investment.

The Experiential Learning Cycle will continue to be the model under which the course is implemented. The course will keep on using LT opportunities to enable the participants to move from examining their concrete experience of learning and teaching, supported by a range of learning technologies, through the steps of abstraction, reflection and active experimentation.

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