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ONLINE PROFESSIONAL DEVELOPMENT THROUGH ACTION RESEARCH: A NEW ZEALAND EXPERIENCE

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Abstract

This paper examines the impact and effectiveness of an online professional development course to support teachers as beginning researchers. The course is taught wholly online, and teachers develop understanding of research methodology, negotiate their topics, and design their research projects via online interactions with their supervisors. Teachers then implement, observe and evaluate a substantial investigation on an aspect of information and communication technologies (ICT) in education using action research methodology. The paper will examine teachers' perceptions of this professional learning experience where all guidelines, instruction, mentoring and support occur within the online environment.

New Zealand's National ICT Strategy supports a range of professional development approaches where the focus is clearly on supporting teachers to plan, implement, observe and evaluate the use of ICTs to enhance learning experiences. Action research provides an appropriate framework to effectively guide this process, and aligns with the findings of a recent Ministry of Education sponsored research report assessing the progress of the ICT Strategy nationally. The paper will explain how the Diploma in ICT in Education (DipICTEd) offered at the Christchurch College of Education links with the National Strategy and how teachers participate in action research in their classrooms through online professional development.

Introduction

When one starts to investigate a topic as broad as online education, different terms like "distance learning", "resource based learning", "electronic course delivery", "open learning", "flexible learning", and "online learning" immediately come to the fore. The term "open and distance learning" (ODL) is also frequently encountered.

ODL means that students will be able to receive and access information and guidance regardless of geographical proximity and that access to this type of learning will be, in some sense wide and open, and can in fact be seen as flexible learning. Graham, McNeil and Pettiford (2000, p.4) define openness in terms of time and therefore access to learning resources. The technological requirements of some types of ODL have led people to fear that learning may become less open in the sense of being restricted to fewer people (Kearsley, 1998, as cited by Graham et al, 2000, p.4).

The creation of the Internet and the development of the World Wide Web have not only influenced all aspects of modern society including learning (Sangster, 1995, p.1) but have also resulted in online

education becoming a topic of ongoing debate (Werry, 2001, p.1). Hatch (2002, p.241) states that technology has become the driver of change opening up new possibilities for the way in which people interact, communicate, work and study.

Sherry (1996, as cited in Graham et al, 2000, p.2) is of the opinion that the "chalk-face" models of teaching will have to be changed from a transmission model to one which is "much more complex, interactive and evolving". For many teachers this will not be a comfortable change and they will require support. This paper will explore how the use of online teaching and learning is supporting teachers to investigate their own classroom practice through action research, as part of their own professional development.

How have things changed?

The Internet and the World Wide Web have altered approaches to education by changing the interaction between teacher and student, student and content, teacher and content, and student and student. In short, the ways teachers communicate with learners and learners communicate with each other are rapidly changing. Technology has enabled a different approach to education and phrases like online teaching and learning, e-learning (electronic learning) or web based learning are becoming part of many educators' everyday language. These significant changes to education represent a "paradigm shift" from the traditional views of teaching and learning. Collison, Elbaum and Haavind (2000, p.14) call the evolution of the possibilities of online teaching and learning, a New Landscape, where-as Kachelhoffer (2001) refers to it as the New Frontier of Education.

Time and time again it has been said that we live in an age of change, and Inglis, Ling and Joosten (2000, p.14) argue that we are experiencing a qualitatively different change to what was experienced at the beginning of the 20th century when machinery driven by steam, electricity and petroleum replaced manual and animal power. They qualify their argument by saying that the change we are experiencing now is significantly different in pace. The current era, according to them, is marked by restructuring and transition, in which social institutions, including education, are undergoing dynamic transformation. What was once considered a special form of education using non-traditional delivery systems is now becoming an important concept in mainstream education (McIsaac and Gunawardena, 1996, p.403). The educational field has to deal with, *inter alia*, a transformation in the way in which we see learning. While it has been possible to divide the approaches to education into three categories, namely: the traditional face-to-face classroom, traditional distance education, and the electronic or online learning environment, the distinctions between these categories are becoming blurred. The electronic or online learning environment has the potential to transform and permeate both distance education and the traditional classroom in such a way that the categories are no longer discreet (Ministry of Education, 2003, p.4).

What then is online teaching and learning?

By now it is becoming clear that online teaching and learning is part of a revolution in education. The role players in this revolution are
• The student
• The facilitator
• The curriculum and
• The technology.

At the heart of this revolution is a completely new pedagogy for which most teachers are not trained (Arsham, 2002, p.9). Furthermore, administrators do not understand this new pedagogy and its implications. What is currently happening is that many untrained teachers are fooling themselves, and are being fooled into believing, that all they need to do, to be part of this revolution, is to convert existing courses to Web-page format and be prepared to answer the e-mails (Arsham, 2002, p.9).

So how should we describe online teaching and learning? It is very tempting to think of online education as only the action of putting the materials and resources together in a course management system, like StudentNet, Blackboard, WebCT etc. It is also important to note that educators are moving away from the idea of a course management system (CMS) and are becoming more aware that the system should support educators to manage students' learning and not the course. What is becoming apparent is that most online educators see the discourse that occurs both between the teacher/lecturer and the students, and among the students themselves, as the most important element of the programme. There are three types of online discussions that can be engendered by the tutor: (Macdonald & Caverly, 2001, p.42).

- The student asks questions of the tutor or hands in assignments and tasks. There are no interactions between the students. Generation 1 type course.
- Interaction is encouraged between the students but discussion is controlled by and led by tutor discussion. Generation 2 type course.
- Interaction between students online are led by student questions and answers but managed by the tutor. Generation 3 type course.

Salmon (2000, p.25) suggests students grow in their ability to participate in discussions through a five step incremental model: a) access and motivation acquisition, b) online socialization, c) information exchange, d) knowledge construction, and e) independence development allowing learners to take charge of their own learning. Type 1 discussions help students to move through the first three of these stages.

Stage 1	Access and motivation acquisition
Stage 2	Online socialization
Stage 3	Information exchange
Stage 4	Knowledge construction
Stage 5	Independence development allowing learners to take charge of their own learning

Figure 1 The stages of student's ability to participate in online discussions

In this "New Educational Frontier" wisdom is developing about the capacity of digital media to enhance learning or to accommodate learner convenience and preference. Digital courseware (materials developed for delivery by digital media such as CD ROMs, web pages, Internet, chat-rooms, discussion boards, e-mail etc) has the potential to offer increased flexibility with respect to *place, time, pace, entry* and *exit* (Inglis, Ling & Joosten, 2000, p.18).

ICT professional development for teachers in New Zealand

The changes in the education sector as discussed in the previous paragraphs, and the impact expected in schools and on students in New Zealand, urged the New Zealand government to develop the country's first National ICT Strategy 1999-2001 (Ministry of Education, 1998, p.2). A second National ICT Strategy 2002-2004 followed this (Ministry of Education, 2002, p.3). The aim of the first Strategy was, *inter alia*, to create a learning environment that enables students to develop the attitudes, knowledge, understanding and skills to enable them to take their full place in society. The role of information and communication technology (ICT) to achieve this aim was clearly identified (Ministry of Education, 1998, p.2).

The first National ICT Strategy for schools focused on a number of initiatives of which three dealt with professional development. These initiatives were:
- The establishment of an Online Resource Centre for teachers, hosting *inter alia* curriculum resource materials, lesson plans, classroom activities using ICT, links to curriculum experts, an interactive centre for e-mail, online chats, and professional development opportunities for principals and teachers. It also hosted links to government agencies, including the Ministry of Education. This online resource centre was called Te Kete Ipurangi (The Online Learning Centre) and can be viewed at http://www.tki.org.nz/

- The ICT Professional Development Cluster programme for professional development for teachers in ICT.
- The Principals First: First Principles programme of professional development in ICT for school principals.

It is clear that considerable time and money went into the implementation of the first National ICT Strategy and its associated initiatives. The Ministry of Education also funded research investigating the effectiveness of the first National Strategy. The aim of the research was to evaluate:

- The different 'school cluster' professional development models.
- The effectiveness of the ICTPD cluster programmes in terms of administrative efficiency, policy development and strategic planning for ICT in participating schools.
- The effectiveness of the ICTPD cluster programmes in increasing teachers' skills and knowledge related to ICT applications.
- The training of principals. (Ham, Gilmore, Kachelhoffer, 2002, p.3)

The research reported on different aspects of the implementation of the Strategy of which the most relevant for this paper is the reference to classroom usage. Ham, Gilmore and Kachelhoffer (2002, p.5) refer to the fact that the great majority of participating teachers reported that the ICTPD programme had increased their effectiveness as teachers and helped them to offer more varied, motivating and creative teaching and learning activities. Some teachers in these clusters were interested in investigating their own effectiveness with teaching and ICT integration and a group participated in an action research workshop (Ham, Gilmore, Kachelhoffer, 2002, p.21).

Following the success of the first National ICT Strategy, a sequel was launched in 2002. The vision of this second Strategy is that all learners will use ICT confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the *global community* (Ministry of Education, 2002). The significant changes in education enabled by digital technologies, and discussed earlier in this paper, were catalysts for the initiatives introduced in New Zealand's second National ICT Strategy. With this Strategy the Ministry of Education acknowledges that the expansion of ICT is driving significant change in many areas and that the challenge is to create a learning culture that keeps pace with these changes (Ministry of Education, 2002, p.7).

The Strategy presents goals for teachers and students to develop their ICT skills, knowledge and understanding. It emphasises that learners should have opportunities to develop digital information literacy and use ICT in extending their horizons. One of the strategies to attain this goal is to promote the development of online learning options and opportunities for learners (Ministry of Education, 2002, p.12). The Ministry of Education suggests that teacher education providers (like the Christchurch College of Education) work with teachers, schools or clusters to formalise ways to integrate ICT professional development programmes in schools into recognised qualification pathways (Ministry of Education, 2002, p.14).

From the previous paragraphs it is emerging that teachers participating in the ICT strategies are starting to look at ways in which they can investigate and better their own ICT practice through professional development and how they can formalise gaining qualifications or course recognition while doing so. This move is strongly supported in the second ICT Strategy (Ministry of Education, 2002, p.14).

Action research, online teaching and learning and ICT integration

As discussed in the previous paragraphs, ICT professional development is a focus area for the Ministry of Education and teachers. Many teachers are keen to participate in professional development programmes to further their own professional learning and also to gain course or qualification credits as an additional outcome.

The Christchurch College of Education is the leading provider for teacher education in the country as well as being the oldest teacher training institution (126 years). The College is divided into different schools:
- School of Primary Teacher Education
- School of Secondary Teacher Education

- School of Early Childhood Education
- School of Business Studies.
- School of Professional Development

The Diploma in Information and Communication Technology in Education (DipICTEd) is one of the qualifications offered by the School of Professional Development. This qualification has two major aims throughout all the courses, namely to:
1. Introduce skills and concepts to teachers related to the use of ICT as effective teaching and learning media in education.
2. Develop an awareness of the pedagogical issues involved in the integration of ICT into classroom practice.

The DipICTEd is a two-year equivalent full-time qualification consisting of the equivalent of seven one-semester courses. Students must complete three core compulsory courses and three optional courses. All courses are available online and all (except the research paper which will be discussed below) require 50 hours teaching time, or the equivalent online time, plus 125 hours of individual study time.
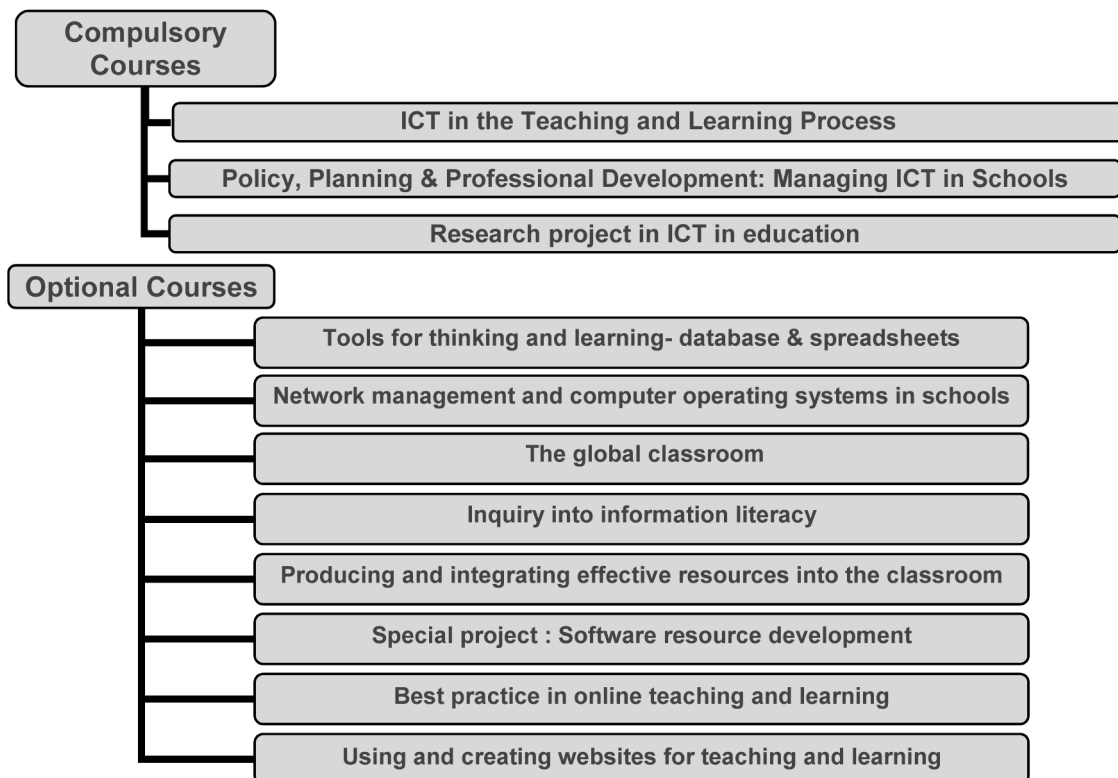
Compulsory Courses
- ICT in the Teaching and Learning Process
- Policy, Planning & Professional Development: Managing ICT in Schools
- Research project in ICT in education

Optional Courses
- Tools for thinking and learning- database & spreadsheets
- Network management and computer operating systems in schools
- The global classroom
- Inquiry into information literacy
- Producing and integrating effective resources into the classroom
- Special project : Software resource development
- Best practice in online teaching and learning
- Using and creating websites for teaching and learning

Figure 2 Courses in the Diploma in ICT in Education

One of the compulsory courses, the Research Project in ICT in Education, is a two-semester course. The ICT professional development in this course involves the completion of a specific action research project related to the application of ICT in education for which candidates receive two course credits in the DipICTEd on successful completion of the project. Teachers and their research supervisors communicate via the online environment to negotiate a specific topic to be researched. Teachers then design, implement, observe and evaluate a substantial investigation on an aspect of the role or application of ICT in education using action research. The teacher receives all guidelines, instruction and guidance to successfully complete this professional development through online teaching and learning. All discussions regarding research questions, research methodology, the compilation of data gathering instruments, the execution of the research, analysis of data, presentation of data etc, occur online without the lecturer and teacher (student) ever meeting face-to-face.

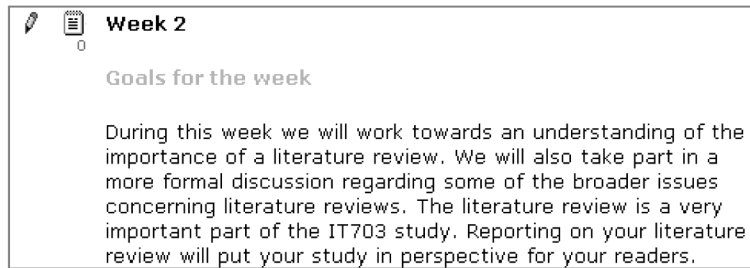Below are three examples of screens taken from the online class.

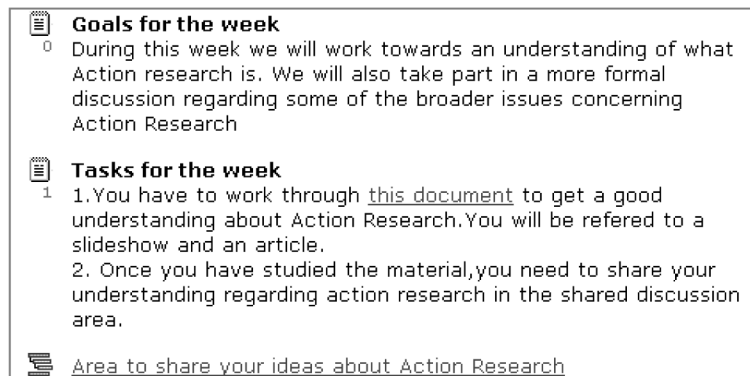*Figure 3 Starting with the literature review in the online environment*

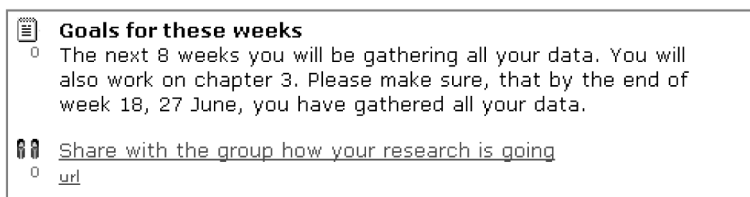*Figure 4 Starting to investigate Action Research in the online environment*

Figure 5 Sharing research experience

From the above graphics it is clear that students are expected to participate in sharing and discussions in the online environment in the same way as they would in a face-to-face class.

It is expected that students will, at the end of the course, submit a formal report on the action research undertaken and that the report shall contain an outline of the project's rationale and action research methodology, as well as a rigorous analysis and evaluation of the methodology used and the data collected. Students are guided to write the report as they progress through the research process during the year.

The presenters of this paper (who are also the lecturers for this course) undertook research to explore the students' perceptions of this Action Research course, and in particular their views of the implementation of the course, the building of online communities and the impact of the course on the students.
The lecturers conducted the research at the end of the 2002 academic year in order to better understand how to improve the course and to use the results to inform their own practice as online facilitators. The 2002 class consisted of 21 students. As part of the research these students were asked to participate in a mail survey consisting of 48 items using a four-point Likert scale, and three open comment questions. Eleven of the 21 students (52%) returned the survey. While the number is not large, the response rate is slightly better than what is common for mail surveys of this type (Neuman, 1997). The survey consisted of different categories some of which are presented here.

Course Implementation and Content

From the survey results it can be seen that the majority of the students either agreed or strongly agreed that the online environment enabled the content to be presented in an interesting and clear manner. This content related to the process of action research and provided the students, as beginning researchers, with the background and material to guide them in planning, implementing, observing, reflecting and reporting on their own school-based projects. Readings and material dealt with topics including discussion on qualitative research, action research methodology, ethical issues in conducting research, data collection methods, and report writing. Students were positive about the value of this content and the quality of their final research reports reflected their understanding of action research principles and techniques covered in the content.
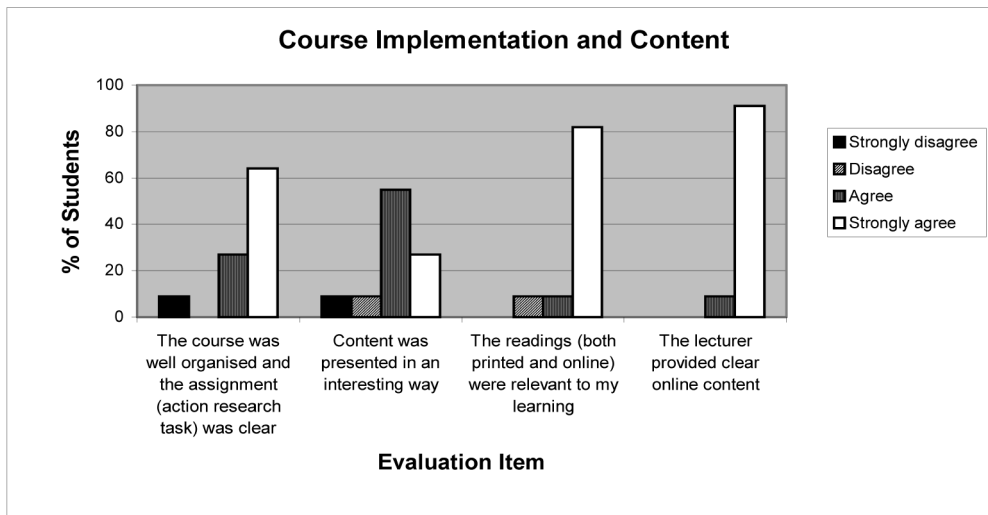

Chart 1 Evaluation of the implementation of the course content

In addition to the Likert scale items identified in Chart 1, students were also asked to rate the five most important attributes that they thought should be presented in an effective online course. Of the 54 attributes mentioned by students, the largest number (34%) related in some way to the course content including its organisation into manageable chunks, guidelines for interacting with the content, relevance to classroom practice, and the relevance of readings and other course material. Students were keenly aware of the content component of the course and survey results indicate that overall they were appreciative of the content and the strategies for interacting with this. The students were able to access the content via the course book and the online environment and apply this as the basis for their own professional development as they focused on a research topic.

Building an Online Community

In addition to the content of the course, the opportunity for interaction with others appears to be another important factor contributing to the success of these students to complete their action research projects. Chart 2 reports on some of the organisational and structural aspects of the course that facilitated interactions with peers and lecturers, and established a sense of belonging to an online community of researchers.

The instructional design of the online learning environment recognises the importance of the affective domain, and the need to build an online community where students can establish their identity and a sense of belonging (Palloff & Pratt, 1999, pp.25-32). Care was taken in the design of the course to incorporate features to enable online socialization where students interact with each other and with the lecturer. Early in the course students are encouraged to introduce themselves and to share their ideas about research, and their initial proposals with each other. As the course progresses there are regular discussion sessions designed to maintain the sense of community, and to overcome the isolation of conducting individual research projects. From the survey results, and students' responses identifying the attributes that they think are most important in an online environment, it is evident that students place a high value on their

interactions with others, and especially the lecturer. Almost all students mentioned either the relationship with their lecturer, and/or the timeliness and quality of the lecturer's feedback as being key attributes of online learning. These interactions are a vital part of the learning process and provide the opportunities to challenge students' thinking, to guide their research endeavours and maintain academic rigour, and to ensure that their action research provides a sound basis for their professional development as they gain course credits.
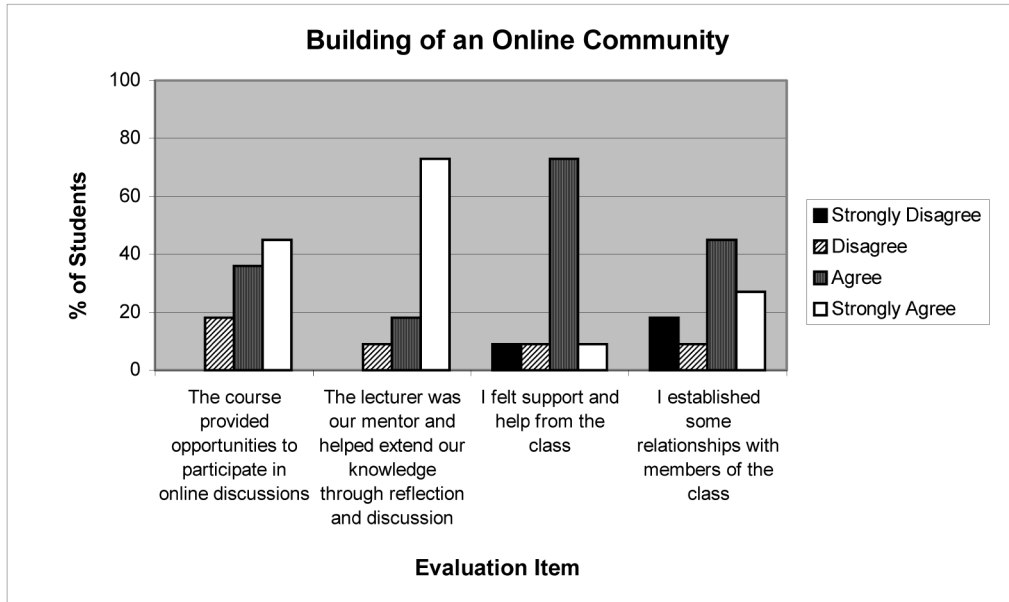

Chart 2 Evaluation of the building of an online community

While students indicated that they did establish relationships with each other, and did experience a level of support from the class, this attracted a lower rating than the mentoring and support from the lecturer. From the lecturers' perspectives this is understandable because, as the year progresses, the inter-student interactions tend to diminish as students become absorbed in their own research and work to reasonably tight deadlines to submit draft chapters of their work and seek feedback. To help maintain a sense of community, lecturers communicate with the whole group via regular emails and regularly post whole-group messages on the course website.

Impact of the Course on Students
As well as course content, and the ability of the online environment to foster a sense of community, the third area of interest to the course lecturers was the impact of the course on the students in terms of their increased understanding of ICT-related issues, and their ability to reflect on, and analyse their own practice. Chart 3 reports on some of the items related to course impact.

One of the key indicators of the success of the course is its overall impact in enabling students to research their own developing practice through action research and to report on this in a manner which will inform others. The items relating to course impact indicated unanimous agreement that the course enabled teachers to understand global ICT in education issues, and provided them with insights that were useful to their current learning or which they felt would be useful in the future.

As teachers were able to identify and negotiate their own action research projects relating to the use of ICT in education, all teachers were involved in implementing research projects that were pertinent to them and their school situation. Teachers were required to develop their own understanding of ICT-related issues through reading widely and conducting thorough literature reviews on their topic.
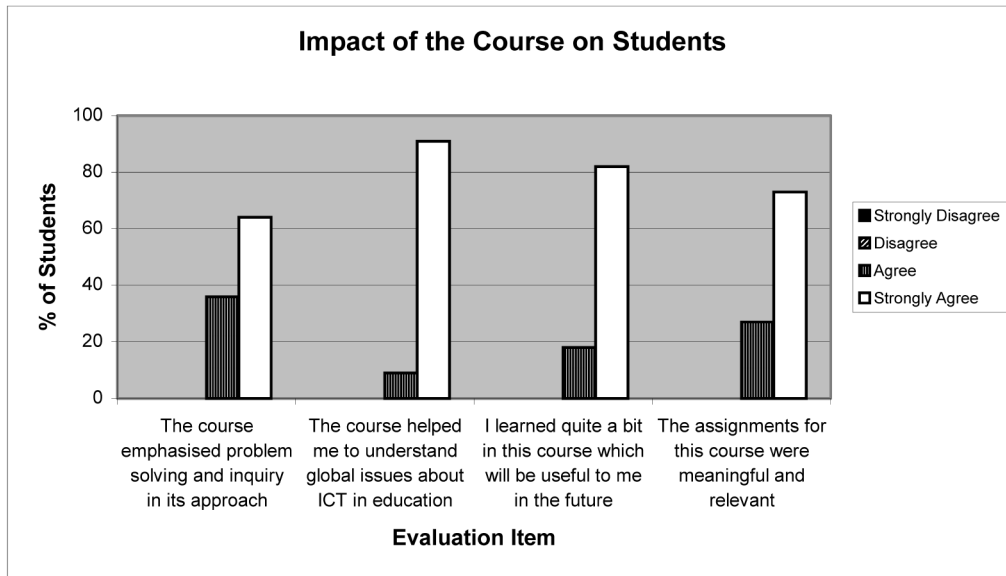
Impact of the Course on Students

Chart 3 Evaluation of the impact of the course on the students

The formal course requirements included a final research report, submitted in bound format, providing evidence of the application of sound action research methodology and comprehensive discussion of the research results. The implementation of an action research process led, inevitably, to a greater understanding by teachers of both the global and local issues relating to their study, and it also equipped teachers to adopt action research as a method to further develop their understanding of teaching and learning related to ICT education. In addition to the items reported in Chart 3, the majority of students (91%) reported that they felt more confident about themselves as learners as a result of participating in the course.

Summary

As the discussion and results suggest, online professional development can successfully support and guide teachers as action researchers. The Research Project in ICT in Education, delivered wholly online, provides the content for beginning researchers to understand action research methodology, and the guidance framework and mechanisms to support teachers in their research endeavours. The course not only teaches the participants about action research, but provides the scaffolding necessary for them to conduct their first major research project. It is clear that the combination of content, guidance, interaction and support, delivered via the online environment contributed to the students' experiences as beginning researchers in the field of ICT.

It is difficult to isolate the specific contribution of the online environment from other factors such as course design and lecturer input. However, the success of this online professional development model is evident in the completed research projects, which will inform future practice, and also in the skills, knowledge and understanding that teachers develop in undertaking such a project. Teachers become familiar with the literature in their chosen area, they develop skills for accessing and analysing this information, and they become more knowledgeable of global issues related to ICT in education. In addition, the action research methodology strengthens teachers' ability to reflect analytically on their experiences in order to inform future practice and provides them with an ongoing strategy for professional learning.

Online professional development through action research supports teachers in their implementation of ICT in line with the second National ICT Strategy; enables teachers to achieve course credits towards qualifications as part of this professional development; and most importantly, equips teachers with the knowledge, skills and understanding necessary for future research and learning related to ICT in education.

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