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Developing a model of peer collaborating in E-learning that can be applied to the PNG context

Lalen Julieanna Simeon
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**Developing a Model of Peer
Collaborating in E-Learning that can
be applied
to the PNG Context**

A thesis submitted in partial fulfilment of the
Requirements for the award of the degree

Doctor of Education

From the

University of Wollongong

by

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Dip. Ed. (PAC), Dip. Off Admin (PAU), BEd (PAU) MEd (UOW)

Faculty of Education

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Abstract

There is an expectation that lecturers should be equipped with the skills needed to apply technology to support and enhance learning in their subjects. For many lecturers, the increasing emphasis on the use of ICT for research and teaching can be threatening, but these fears can be eased if professional development is supportive and ongoing, and provided in flexible, appropriate and adaptable ways.

This study focused on collaboration strategies employed by four lecturers and two instructional designers (IDs) as they worked together to develop online learning environments as well as other types of learning resources. It focuses on two case studies and describes the roles that the two IDs played in facilitating the professional development of lecturers that were constructing e-Learning environments.

The findings suggest that the lecturers needed ongoing support, advice and technical assistance for an extended period of time. Lecturers who are novices in using ICT for learning, should be encouraged to attend basic ICT training programs before working with IDs and ICT experts to design e-Learning resources for their subjects. Providing technical training by ICT experts enables lecturers to see the benefits and potential of ICT in learning and gives them the confidence to plan effective e-Learning environments.

The results are consistent with previous research findings, stressing the need for professional (IDs, ICT experts and lecturers) to collaborate and share their ideas, knowledge, expertise and skills in order to plan and design effective and meaningful learning environments. It is also important for IDs to explain their role clearly and outline the type of support and assistance they would provide during the design process.

Lecturers who collaborated closely with the ID/ICT experts gained more skills and were prepared to use ICT in learning while those who spent less time with them were less confident and had to attend ICT training courses during the session. This study demonstrated that having regular group meetings during the design process, receiving individual ICT support, having a good rapport between members of the design team helped to decrease lecturers' concerns and ICT problems.

This study has enabled the researcher to develop a team collaboration model for planning and designing e-Learning resources that would be piloted in tertiary institutions in Papua New Guinea. The findings, also contributes to the research literature about the design processes needed to improve the quality of learning resources. As team members share and learn from each other's experiences and expertise, they create authentic and student centred learning environments.

Declaration

I, Lalen Julieanna Simeon, declare that this thesis is submitted in partial fulfilment for the requirements of the award of the Doctor of Education, in the Faculty of Education, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledge. The document has not been submitted for qualifications at any other academic institution.

Signed:

Date:

Dedication

To my parents, late Nancy and Paul Kavaia, who believed in education and encouraged me to set my goals and work hard to achieve them. To my late mother, I am sure you would have been proud of me. Thank you for being my role model.

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First and foremost I would like to give glory, honour and praise to my God for helping me to successfully carry out this study.

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CHAPTER ONE

STAGING THE SCENARIO

1.1 Introduction

Pacific Adventist University (PAU) is a senior tertiary institution operated by the Seventh-day Adventist Church in Papua New Guinea. PAU is located about 17 kilometres from Port Moresby the capital city of Papua New Guinea. The University commenced operation as Pacific Adventist College in 1983, and obtained university status in 1997.

The University provides tertiary education from all over the Pacific Islands to an increasing number of students in the fields of Business, Education (secondary & primary), Humanities, Office Administration, Nursing, Theology, Science and Technology. Just like any other modern University, PAU is committed in ensuring that the staff and students have access to the latest technology, including the Internet.

With fourteen Apple computers, PAU established its first computer laboratory in 1987. Exclusively, students and staff in the Faculty of Business used these computers and in 1990 the Apple computers were replaced with 16 IBM computers. As the demand for computer usage increased in other faculties (Education, Humanities, Science and Theology), the university purchased another 32 IBM computers in 1997 and developed two more computer labs, which are now available to all students and lecturers. At present, some faculties, such as the Faculty of Science and Technology, have their own computer laboratory, while the Faculty of Humanities is currently working towards setting up their own.

The three computer laboratories, and all staff offices, were networked and connected to the Internet in 1998, but the Internet did not become available to faculty members until 1999. Initially, only three computers were set up for students to browse the Internet in the Library. Towards the end of 2000, each student was given an email account with either limited access or a predetermined quota for browsing the Internet within the computer laboratories at the university. The Administration of PAU funded that initiative, as their intention was for students and staff to experience and use information and communication

technology (ICT) in their work. At the present time, only lecturers with a computing background teach computer-related subjects. All lecturers, however, are now using computers and the Internet in their work. Nevertheless not many lecturers have been using ICT in their teaching.

The availability of the Internet and other technological resources does not guarantee that lecturers will be comfortable to use it in their teaching. They still require basic ICT training, support and advice to assist them and help them gain more confidence in using ICT in the learning environment. Later in this chapter, further explanation of the rationale of this study will be discussed, showing how lecturers and staff would be assisted in using ICT in learning.

1.2 Researcher's Background

The researcher is a lecturer in the Faculty of Business at PAU instructing mostly computer-related subjects to students enrolled at the university. She is also involved in running introductory computer courses to groups of primary school teachers with the aim of assisting them to learn ICT skills to facilitate them in their work. After completing her Masters majoring in Information Technology, Training and Education at the University of Wollongong, she began to get more involved in running basic ICT training programs for different groups of employees, students and women's groups.

PAU has an IT manager and an assistant both responsible for the entire network, and it also makes use of students to assist with ICT work. With limited ICT personnel available, it was hard for the researcher to receive ICT assistance with the planned online learning pilot program in 2001. As a pilot project, the researcher then negotiated with the Adventist technological group in North America to host three online courses on their server for three lecturers at PAU. The aim of the pilot project was to assist lecturers experience the benefits of using ICT in the learning environment. All things considered, PAU has the technological resources (except for the expensive WebCT software). The academic office agreed that the pilot project should indicate the direction to take, using ICT in learning.

The lecturers agreed to participate in the project, but just before the project began, two of the lecturers decided not to participate and only one (Arts &

Humanities subject) completed the experience with his students for one whole semester. The discussion space was well used by the students, and the lecturer enjoyed the experience and wanted to continue with it. The lecturers who had discontinued commented that they did not have the time to re-design their subjects and felt that they lacked the IT knowledge and skills.

The issues resulting from the pilot project are striking:

- Lecturers need basic ICT training to help them to use ICT in the learning environments, and this support must be continuous.
- A more flexible training program is required to suit individual lecturers' work schedules.
- An open invitation to lecturers will only result in interested ones that will run with the IT training team.
- There is a need to have a qualified and experienced Instructional Designer (ID) or IT expert on staff, one who has some background in designing learning environments to support the trainer and lecturers in the training and design process.
- There is a need to have training strategies in place to assist lecturers use ICT in learning.

1.3 Current ICT trend in Papua New Guinea

A meta-survey conducted by Vaa (2002) funded by UNESCO resulted in a report about the current level of ICT access and use in Papua New Guinea. It notes *inter alia* that the PNG government recognises the importance of ICT and its benefit to the country and has allocated a centralised ICT budget with an aim to "...develop and launch an ICT policy in the country" (Vaa, 2002, p.204). Unfortunately, since the establishment of such budgets, all attempts at encouraging the use of ICT have been unsuccessful for numerous reasons, such as: incompatible appliances and applications being installed, as well as different ICT approaches on the part of many donors. As a result, organisations and educational institutions have been developing their own policies on the use of ICT for their institutions. The report outlined some important views by organisations that utilise ICT (Vaa, 2002, p.204) among which were recognised that:

- There needs to be a blueprint for ICT development so that change is uniform and not rhematic.

- PNG does not really have an ICT infrastructure.
- PNG needs as much assistance as possible otherwise it will fail to realise its plan's.

At present, there are five major Internet service providers (ISPs) in PNG, but licensing of these ISPs is still a monopoly controlled by Telecom PNG. Most people in the urban centres especially in Port Moresby and Lae access the Internet either through work-stations or through educational institutions (Vaa, 2002, p.205).

The University of Papua New Guinea (UPNG) itself has been working in partnership with Telecom PNG, which has enabled them to use multimedia in their distance education (DS) programmes through its fourteen (14) regional DS centres throughout the country. Five of these regional centres have a lab with 20 computers networked to the university's Intranet system. This indicates that PNG is already using technology to provide distance learning to a great number of students in the regional centres who cannot make it beyond year 12. The report (Vaa, 2002) also states that:

...the Department of Education plans to increase its existing computer network systems...provide specialist training for information technology staff and provide audio and video conferencing to some remote schools on a trial basis (Vaa, 2002, p.205).

Furthermore, the government plans to develop a network system for Education and Research aiming at linking the five universities and other tertiary institutions in the country. In addition to these developments, AusAid has funded five ICT and multimedia centres in five Teacher Colleges in PNG between 2001 and 2002. Basic ICT training programs are being conducted to assist lecturers learn the skills which will enable them to use technology in their work.

Sustainability of these ICT centres is another issue that has prompted AusAid to train selected lecturers from each Teacher College to become the technical assistants to provide the basic ICT support to lecturers. ICT assistance can also be received from ICT experts and trainers from the universities. ICT is available in most urban schools in PNG but is not used to its full potential. This implies that lecturers require assistance to master ICT skills that will assist them to be comfortable in using the multimedia resources that are available in their schools.

Most tertiary institutions should be benefiting from the use of ICT by this time, but the following constraints were identified (Vae, 2002, p.205) which have stopped ICT being fully implemented in the country:

- High cost of equipment as well as domestic and international telecommunications.
- Unreliable power supply in most centres and poor quality of Internet connections.
- High cost of telecommunications for communication nationally and internationally.
- Lack of skilled support services.
- Poor access to telephone networks.
- Lack of bandwidth.

Despite these constraints, some tertiary institutions have been doing their best to provide ICT training and support to the lecturers to use to it in their work.

1.4 Organisational Challenge

The availability of the multimedia technology and the Internet at PAU poses a challenge to ICT experts and trainers to assist and support lecturers to use ICT in the learning environment. Traditional face-to-face teaching has been, and still is, the main method used in PAU since it was founded in 1983. Students attending PAU come from different developing countries around the South Pacific and most of these students have very little knowledge of how to use computers. Students, therefore, are all required to do a compulsory subject known as *Introduction to Computer Studies*. The experience of teachers is slightly different, as most of them are quite familiar with the Internet and use other software products similar to Microsoft office programs (Excel, Access, Word) to do their work. Taking another step of using the available technological resources in the learning environment would be a new experience that will challenge lecturers to develop competence in using ICT and confidence to take risks and try new teaching practices as they collaborate with IDs to plan appropriate e-Learning activities for their students.

The introduction to the pilot project in 2000, as earlier described, simply failed because the particular lecturers were not prepared to attempt something new. This

also suggested that more ICT experts should be involved to sustain the lecturers in the design process, such as instructional designers, computer technicians, programmers, etc. Such ICT expert support will have to be ongoing, therefore it is important to describe and evaluate the collaboration strategies that ID(s) and lecturers employ during the process of developing ICT-supported courses in tertiary institutions with a lot of experience in this area. It was an important area of investigation that had personal relevance for the researcher.

ICT has the potential to enhance learning for students at PAU but lecturers need to change their approaches to teaching. Fisher and Nygren (1999) argued that:

... technology itself is a catalyst for change fundamentally encouraging different forms of interactions among students and between students and teachers; engaging students in higher-order cognitive tasks, and promoting teachers to question old assumptions about instruction and learning (Fisher & Nygren, 1998, p.4).

Jonassen (1999) argued that technology is more than hardware: “Technology consists of the designs and the environments that engage learners to facilitate ideas and construct knowledge” (p.2). In order for the lecturers (beginners in technology) to use ICT to support learning, they require assistance and technical support from instructional designers during the process of planning and designing their online subjects. King et al., (2000) pointed out that every educational institution needs an instructional designer to provide technical advice and support to lecturers/educators. The process of designing online environments requires a collaborative approach since both groups (lecturers and IDs) are experts in their own fields, and have a lot of experience to share with each other (King, et al., 2000).

1.5 Rationale for this study

This study is motivated by the need to find ways of assisting, training and supporting lecturers (beginners in using ICT) work to engage collaboratively with ICT experts such as IDs, IT technicians etc., in developing ICT-supported learning environments.

Collis (1996), McNaught (2001), Oliver (1999), Fisher and Nygren (1998), reported on some suggested models and how they assisted and supported faculty members who were novice online-users in their institutions. A common theme

emerging from these reports is that lecturers attempting to use online learning environments would require a lot of support, advice; that assistance from experts such as instructional designers/learning designers; IT technicians; graphic designers, and otherwise experienced academics implementing ICT in e-Learning is needed to support them throughout the design process. According to Fisher and Nygen (1998):

... introducing technology into the classroom appears to provide a catalyst for putting these concepts (incorporate interdisciplinary studies, team teaching, accommodation for students with different learning styles, etc. into practice and helping both students and teachers succeed, sometimes in dramatic fashion (Fisher and Nygen, 1998, p.9).

They further state that teachers/lecturers only become comfortable in using technology when they receive appropriate support from IDs, ICT experts and experienced online users. When teachers (lecturers) are comfortable in using ICT, they may then adjust their approach to teaching and learning from curriculum-centered to learner-centered; from individual tasks to collaborative work, and from passive learning to active learning (Jonassen, 1998). Jonassen (1999) posited that technologies are tools for learners to construct their own knowledge therefore teachers (lecturers) need assistance from IDs to assist them learn the appropriate skills and knowledge of using ICT to enhance learning.

Lecturers at PAU are computer literate, but they are novices in the field of using ICT. In the learning environment, it is therefore important to have some form of program that will enable them to collaborate with the ID and ICT experts to design ways of using the available ICT equipment to aid their subjects. PAU at present is offering two courses – a Masters degree in Theology and a postgraduate degree in Nursing on a part-time basis - where students are expected to attend four (4) weeks of intensive work on campus while they do the rest of the work independently in their work place.

1.6 The Problem

Lecturers in both developed and developing countries who are experts in their subject areas cannot, however, be expected to automatically transmit their expertise, skills and knowledge into ICT-supported learning. Lecturers require support from IDs who are experts in designing online learning environments to assist them plan, design and use ICT in their work. Lecturers and IDs need to

collaborate as a team to share their ideas and expertise. A successful working team is one where members have a strong relationship amongst themselves (Price and Schlag, 2002).

Oliver (1999) stated that ICT enhances learning when proper planning, organisational support and technological team support is given to the development team as they collaborate in designing e-Learning environments. Keppell (2000) concluded that lecturers require such ongoing support to enable them to use the full potential of ICT for student learning.

The main problems experienced in tertiary institutions are as follows:

- Many lecturers are new to online learning so they require a strong supporting network from experienced colleagues, IT experts and the administration to assist them use ICT in their work.
- Lecturers could comfortably use ICT provided they have a good rapport with IDs.
- Instructional Designers are specialists in their own area, but they still require lecturers' input in the design process.
- Effective and quality online learning environments can only be achieved through a successful collaboration process.

Many lecturers in tertiary institutions have embraced the idea of using ICT in their work. However, not all environments have successfully utilised ICT to enhance learning. Collis (1996) and McNaught (2000) reported that lecturers who receive ongoing support and training gain the skills and knowledge needed to utilise the potential of technology. This requires lecturers and IDs to collaborate as a team in designing environments.

1.7 Definitions

Instructional Designer

King, et al., (2000) define an ID as someone who is focused on best teaching practice and assist faculty or lecturers in meeting student needs using the most appropriate and effective tools, resources and strategies available.

Collaboration

Is defined as a learning process which emphasises group or cooperative efforts among faculty and students. It also means active participation and interaction among participants

Team

Collections of people who collaborate, to some degree, to achieve common goals.

ICT

Information and Communication Technology is the technology that is used to manage information and support communication for the purpose of learning.

(ICT) ... is a broader concept (than online learning), encompassing a wide set of applications and processes which use all available electronic media (intranet, Internet, audio/video tapes, CD-ROM, etc) to deliver vocational education and training more flexible. (ANTA, 2003).

1.8 Purpose Statement

The purpose of this study is to describe the roles and facilitation strategies that two Instructional Designers employed as they each supported lecturers in the development of a suite of ICT-supported subjects in two graduate courses.

The study compares and contrasts two cases. The first case study involved three lecturers and one ID and the second case involved one lecturer and an ID as they collaborated to plan and design an e-Learning environment for one whole course. This study also describes the design strategies employed by experienced lecturers in designing environments.

1.9 Theoretical Framework

This study adopts the collaborative team theory approach suggested by Johnson and Johnson (1997), where membership of a team has a limited life span and members know their specific roles or functions within the team (Johnson & Johnson, 1997).

Teams can be classified in different ways. According to Johnson and Johnson (1997), '...a work team is a set of interpersonal interactions structured to (1)

maximize member's proficiency and success in doing their jobs and (2) coordinate and integrate each member's efforts with those of the other team members' (Johnson and Johnson, 1997, p.508). They further stated that a team's performance should include work products that require the joint efforts of two or more members as well as individual work products. The authors also mentioned that teams not only meet to share information, perspectives and make decisions, they should also produce discrete work through members' joint efforts and contributions.

Some teams are formed for long-term periods for special purposes while others exist temporarily. Teams vary in sizes, some having as many as twenty people, while others may only have two, three or four members. The dynamics of a small team of two, three or four are very different from bigger teams (Belbin, 1998). Despite the different sizes of each team, the most important thing is the flow of communication and the collaboration process that should keep members together to achieve the goals of the team. Kaye (1997) pointed out that groups are different from teams because of their hierarchical setting. For example, teams emphasise collaboration where members depend on each other by sharing information and responsibilities as they strive towards achieving a common purpose. Dyer (1987) stated that teams are collections of people who must rely on group collaborations if each member is to experience the optimum of success and goal achievement. He further stated that '... although all teams represent a collection of people who must collaborate to some degree, to achieve common goals, there is a difference in the amount of collaboration that is required,' (Dyer, 1987, p.47). Some teams are required to meet regularly to work very closely together, such as a football team. Other teams would work towards the common team goal but members do most of the required work alone. The latter team style only requires members to meet when an important decision needs to be made that would require the coordinated efforts of all team members (Robbins & Finley, 2000) and the latter team approach is adopted in the two case teams involved in this study, where the lecturers and IDs only meet when they have important issues to discuss and clarify.

The literature records many different types of teams, however Johnson and Johnson (1987) listed three most common types of teams that may be used in an organization:

1. Problem-solving teams;
2. Special-purpose teams; and
3. Self-managing teams.

This study uses two teams for two case studies and employs some characteristics from the special-purpose teams and self-managing teams from the list above.

The lecturers and the two instructional designers in this study were required to collaborate together as a special purpose team with an aim to design ICT-supported learning environments. The self-managing team techniques employed by the two teams required lecturers to learn new ICT skills and integrate these skills into their own pedagogy style as they designed e-Learning activities for the students enrolled in their subject. It was anticipated that lecturers would be collaborating amongst themselves as well as with the ID responsible for their team. Both teams were expected to adopt a collaborative learning process as they worked together in designing e-Learning environments. Collaborative learning is not a hierarchical situation where one partner will try to impose his/her view on other members in the team using his/her authority. Collaborative learning requires members to share information and responsibilities and learn from experts. The IDs and the lecturers in this study were expected to interact and depend on each other's expertise throughout the design process.

Parker (1994) pointed out that team learning involves the development of interpersonal skills and the establishment of a level of comfort in working with a diverse group of colleagues, strangers and even old enemies. Team collaboration and collaborative learning does not come naturally. Working together in a team environment is learned behaviour, '...before good communication can occur, all team members must value the skills the other members bring to the team,' (Parker, 1994, p.142).

Successful teams are those which set defined goals and priorities, make a plan and schedule their days towards carrying out their plans to achieve their goals. For example, a design team such as the participants in this study, decided to have four of their courses online due to the high demand of full-time employed workers who wanted to do the course both within Australia and overseas. Each team invited an experienced ID who guided and supported them to plan their

goals and their timetable and ensured that they worked towards achieving these goals. Teams progress through various stages of development that affect their ability to facilitate communication, make decisions, implement plans, and resolve conflicts.

This study will adopt the seven-stage model of learning group or team learning development outlined in Johnson and Johnson (1997):

1. Defining and structuring the procedures and becoming oriented.
2. Conforming to procedures and getting acquainted.
3. Recognizing mutuality and building trust.
4. Rebellious and differentiating.
5. Committing to and taking ownership of the goals and other members.
6. Functioning maturely and productively.
7. Terminating.

Members in team one were to develop materials provided on CD ROM, readings, and a website using WebCT. Members in team two were to create a website that might be used by all the lecturers and students enrolled in an entire course. It was anticipated that team members would collaborate in the design process from the planning stage till they completed the final product as shown in Figure 1.1.

Diagrammatic Overview of the Research Process

Adopted from Edgars (2000)

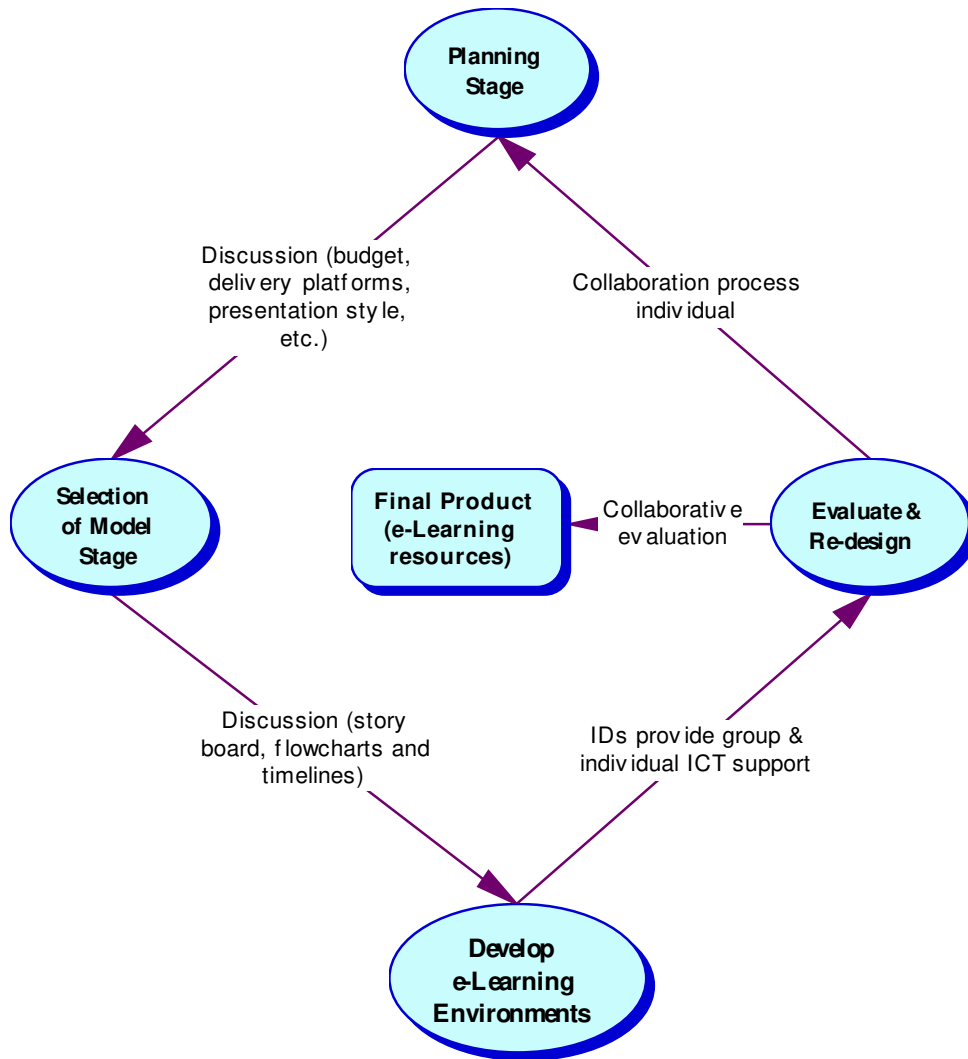


Figure 1.1. Research Process

Members of both teams followed the four stages shown in the design process in Figure 1.1.

1.10 Research Questions

The main question underpinning the study was:

What professional development processes and strategies do IDs and lecturers use as they collaborate to design e-learning environments?

To support this question, a series of sub-questions were used to guide the data collection in the research.

Strategies

- What strategies did the IDs and lecturers employ as they worked in teams to develop e-Learning environments?
- How did the IDs and lecturers use these strategies (in meeting, communication and design) in the design process?

Roles

- What were the IDs' and lecturers' views about the roles they played the design process?

Learning

- What were the IDs' and lecturers' view about the role of ICT in learning?

Concerns

- What were some of the concerns that lecturers and IDs raised before and during the collaboration process?
- How were these concerns addressed by IDs and lecturers?

1.11 Significance of the Research

Introducing technological innovation in an educational institution for the first time requires considerable effort from the technical team as well as the lecturers, academics and the administration. Today, Papua New Guinea (PNG) is still a developing country. PNG plans to use technology (ICT) in learning environments in some tertiary institutions and, in PAU, this will soon become a reality when the required infrastructure is put in place. There seems to be a vast difference between developed and developing countries in ICT-supported learning environments. Many academics, even in developed countries, are still struggling to develop ICT-supported environments, using IDs and ICT experts to assist them develop their courses. This study is specifically relevant to the educational environment in Papua New Guinea because at the time of writing, ICT-Supported Learning Environments are not offered in any institutions in the country. The findings of the study will be used as a training guide or model to assist lecturers (teachers), IDs and the overall development teams to understand the role(s) that each of them should play in the process of developing ICT-Supported Learning Environments.

The findings will be added to the body of literature to understand how IDs and lecturers (especially novices in developing countries) work as a team to collaboratively plan and design online learning environments. The findings will guide and enable the researcher and the PAU technological team as they

collaborate with lecturers in designing ICT resources for learning, and will set some team strategies that IDs can use as they work with lecturers in the design process.

1.12 Limitations and Delimitations

The study will be limited to two case studies, each case consisted of an ID working with one or more lecturers. The aim of the study was to explore how the two IDs at a tertiary institution collaborated as a team with lecturers to plan and design learning environments.

Time limitation was another factor, as the researcher had to work within the timeframe of her scholarship (4 years).

Due to lack of experienced IDs and ICT support in assisting lecturers to learn the skills to use ICT in the learning environment, the study could not be carried out in PNG. The research strategies that will be reported from this study may however, be applicable in the PNG context and especially in other developing countries.

The issue of subjectivity may be raised due to the qualitative nature of the study, which makes the researcher the main research instrument responsible for the collection and analysis of the data. To overcome subjectivity, the researcher verified the data through member checking and familiarising professional staff with environments to check the analysis and interpretation of data. The researcher's financial support was also limited to a short period of time, so everything had to be done within the sponsorship period.

Integrating ICT in the learning environment in PNG (especially at PAU) is a new idea so lecturers would require training and guidance from IDs/ICT experts. The researcher has experience in design e-Learning environments but was wanting to learn and experience how professional and experienced IDs/ICT experts collaborate with busy lecturers in designing e-Learning environments.

1.13 Thesis Structure

The thesis consists of five chapters. The content of each chapter is outlined below.

Chapter one – Introduction

This chapter provides a background of the study and outlines the current ICT situation in PNG. It covers the research questions underpinning the study and identifies the reasons for IDs and lecturers to collaborate.

Chapter two – Literature Review

This chapter provides the supporting evidence from the literature on the different design approaches, theories and concepts. Seven different areas focusing on the use of ICT were covered. The chapter begins by looking at how ICT supports learning at tertiary level, and then discusses the quality and effects of e-Learning environments and the role that IDs and lecturers play in the design process. It then focuses on team collaboration and staff development programs that are conducted during the design process. Finally it presents a few related studies.

Chapter Three – Methodology

This describes the research inquiry used, the site, the participants involved and the methods used for data collection and analysis.

Chapter Four – Discussion

This chapter reports on the analysis of the collected data in the study. It focuses on the research questions and is divided into four parts as shown below:

Part I - Information from preliminary analysis

Part II - Analysis of strategies

Part III - Other contributing factors in the design process.

Part IV - Analysis of final design process and outcome.

Chapter Five – Review and Critique

This chapter reviews the findings of the study and how it relates to the literature.

Chapter Six – Conclusion

The final chapter focuses on the implications of this study for lecturers and IDs in tertiary institutions in Papua New Guinea. It describes a model that was developed out of this study and it outlines the principles that can be adopted by IDs and lecturers developing countries. The chapter concludes by making suggestions for further studies on team collaboration or for community of practice.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The previous chapter explains that this study sets out to describe the team collaboration process that occurs between lecturers and IDs in the development of online learning environments. The purpose here is to review the latest literature relative to the theoretical aspects of the team collaboration process between the lecturers and IDs during the development of e-Learning environments.

General Review of Literature

The aim of the literature review is to critically explore the role of e-Learning and its implications for this research project. The areas covered in the literature are as follows:

- Using technology (ICT) to support learning at tertiary level.
- Effective and quality e-Learning learning.
- E-Learning and lecturers.
- Instructional Design
- Instructional Designers (IDs)
- Roles of IDs in e-Learning environments.
- Staff development and team support.
- Collaboration in the design process.
- Literature relating to PNG situation
- Specific studies related to this study.

The review of the background literature relating to the role of instructional designers (ID) and lecturers in e-Learning is well recorded. There are also quite a number of different approaches to studies in the literature that lecturers and IDs could take when designing online learning environments. However, only a few describe the design process between IDs and lecturers as they collaborate as a team to develop quality online learning environments. This study will provide valuable opportunities to add to this growing body of literature.

Not all lecturers in tertiary institutions, in both developed and developing countries, are able to design their own online subjects and computer-based

learning resources. There is still a need to explore the collaboration strategies used by IDs and lecturers that underpin the e-Learning design process from the planning stage till completion.

2.2 Using Information and communication technology (ICT) at tertiary level

The use of the Internet, the World Wide Web and the different varieties of technological equipment and software programs have had a substantial impact on the nature of modern university teaching (Radloff, 2001). In support of this view, Anderson (1999, p.24) stated that ‘...many universities are integrating ICT into their academic courses because they have realised the values of learning it brings to the learner’. He further mentioned that the achievement of excellence in teaching and learning in university education could no longer be sustained using unaided traditional methods. ICT has enabled both students and lecturers to engage in a new form of learning through the process of virtual online interaction (White, 2000). On the other hand, Kook (1997) argued that most academics have unrealistic expectations that ICT would transform the content of the subject and improve their teaching methods through the different facilities that support and deliver e-Learning. Studies have shown both positive and negative aspects of integrating ICT in the learning environment. The truth, however, is that no higher educational institution can avoid the use of technology because technology is here to stay. Therefore all academics should be encouraged to take the time to learn new skills and to use ICT. Agostinho et al., (2002) claimed after conducting an evaluation project which involved academics and designers, that high quality and effective online subjects have improved the standard of teaching.

ICT has not only changed the method of developing learning resources and pedagogy, but has also brought innovation to each organisational structure and culture. An example is the Collis Twente Model (Collis, 1997) where the whole university had to re-organise its program to accommodate the use of ICT in its courses. Universities have used different approaches to review their educational plans to put in place training programs for staff members. Many of them have invested considerable resources into ‘...formulating appropriate strategic and operational approaches in response to what has sometimes been referred to as the technological imperative’ (Holt & Thompson, 1998, p.199).

The literature reports many studies which have been conducted in areas associated with learning with ICT in tertiary settings. Most of these studies focused on specific methods of integrating technology to enhance learning in the researcher's own interest or institution (Siragusa, 2000; Murphy, 2000; Gray & McNaught, 2001; Torrisi-Steele & Davis, 2000; Roblyer & Knezek, 2003; Barnett, 2003). Each study reports valuable evidence to support the use of technology as a transforming tool in education, although some studies (McNaught et al, 2000; Jones, 2001; Rumble, 2001) do point out negative experiences that call for attention from the administration or the funding body. Realising that there is already a wealth of information from the many studies conducted, Cunningham stated that these studies represent:

...documents (research) that provide insight into what students need for the future in terms that are meaningful to all stakeholders and can assist educators formulate a vision for technology integration that transforms education: content, delivery and assessment (Cunningham, 2004, p.52).

ICT has become a great tool in the learning environment, and the only way to really assess its impact on learning is through conducting research. Reports from studies also assist designers to identify problems in their courses and set out ways of improving their design structures. This is one reason why governments, educational institutions and designers themselves have set up evaluation frameworks, guidelines and assurance policies to ensure that there is quality in their online courses.

Impact of ICT

The findings of different studies in the literature concerning the impacts of ICT are varied, but the underlying design structure would be the same in most online courses and this could be replicated in other situations (Agostinho et al., 2002). The impact of ICT is similar in most educational institutions. Table 2.1 summarises some of the impact of ICT, its challenge and possible future trends in the use of ICT found in the literature. It shows that there have been some benefits to the users but that it has challenged institutions to do all they can to support their staff to use ICT.

Impact on Lecturers	Impact on Learners	Impact on Institutions
Benefits <ul style="list-style-type: none"> • Collaboration, network among peers • Learn to facilitate Learning • Accessible to student • Develop quality learning tasks • Assess personal learning and training needs • Availability of ICT support • Enhances lecturers' abilities (Richards et al., 1997) 	Benefits <ul style="list-style-type: none"> • Collaborate with peers • Discuss- (synchronous & asynchronous) • Work independently • Expand network peers • Improve communication skills • Learn teamwork techniques • Enhances students' cognitive abilities (Richards et al., (1997) 	Benefits <ul style="list-style-type: none"> • Increases student enrolment • Keeping up with latest technology • Set policies to guide designers, lecturers
Challenges <ul style="list-style-type: none"> • Funding • Increased workload • Assessment • Access to latest technology • Teaching online in a distance course • Collaborate with IDs • Providing appropriate support to learners • (Sims et al, 2001) 	Challenges <ul style="list-style-type: none"> • Creating a student-centred learning environment. • Access to computers • Teamwork can be hard for some • Some students can feel isolated 	Challenges <ul style="list-style-type: none"> • ICT equipment can be costly • Funding for training programs • Funding for ICT specialist staff members
Future Trend <ul style="list-style-type: none"> • Continue to work with ICT experts • Improvement in staff development programs • Improvement on quality of e-Learning tasks • Collaboration will increase 	Future Trend <ul style="list-style-type: none"> • More authentic tasks (Keppell, 2002; Bennett et al, 2001) • Student-centred learning 	Future Trend <ul style="list-style-type: none"> • Training will expand • Need for universities to offer flexible learning will increase (McNaught, 2001) • Emphasis on quality & rich learning environments

Table 2.1. Impact of ICT in the Learning environment

The benefits mentioned in Table 2.1 above, are commonly reported in many studies conducted on the use of ICT in learning. However, these benefits are different in each situation and depend on the objectives of the course and the choice of learning tasks. E-Learning activities and resources are designed to cater for different levels of learning environments and in most cases, the lecturers decide on the type of activities that would be included on their website. For example, some lecturers may decide to have only the subject outline and assignments on their website; others may decide to include more detailed learning activities and require students to discuss certain topics online. Westhorp (2000) classified the different levels that lecturers could choose to deliver their online

courses as the supplementary level, the complementary level and the wholly online level. The design and structure of each of these levels of e-Learning is determined by the learning tasks and level of students' learning.

ICT enabled lecturers and IDs to design authentic activities (Youngblood, 2001; Herrington & Oliver, 2000; Bennett, 2002) that would encourage critical and higher-order thinking and would enhance students' learning (Oliver, Omari & Herrington, 1998; Quitadomo & Brown, 2001).

However, ICT also has its challenges as summarised in Table 2.1. Some of the studies in the literature (Phelps, Ledgerwood & Barlett, 2000; Hedberg, 2002; Weaver, 2003) have shown that many of these challenges could be overcome through ongoing ICT training programs for lecturers, which would give them the confidence to design creative and high quality learning activities for their students despite their background and culture.

Jonassen et al., (1999) claimed that ICT provides tools that come in different forms and are used to support and extend the learner's ability to understand ideas, concepts and processes in the learning environment. In supporting the positive impact of ICT in learning, Chen (1993, p.25) argued that ICT 'accelerates skills and knowledge acquisition and enhances teacher and student abilities.'

Furthermore, ICT has enabled designers and academics to set real-life tasks that would challenge students' cognitive abilities, instead of spending a lot of time copying notes and memorising important facts from lectures. The development of more user-friendly software has created great opportunities for academics to re-assess the learning activities and develop learning tasks that will stimulate the learner to think. Amory et al (1999, p.113) concluded that:

Learning environments are becoming more creative and diverse with educational institutions becoming, not only information centres for specific content, but also arenas for technology development and innovation.

Challenges in adopting ICT at tertiary level

In general e-Learning has been adopted and accepted by lecturers in universities, especially in developed countries (Shepherd et al., 2002). The reasons for adopting ICT vary; for example, some universities use technology to increase their student population, others adopt it to improve the quality of delivering their courses. Despite their reasons for adopting technology, they have set up policies

that would guide the ICT development team as well as lecturers to develop highly creative and quality learning environments. According to Ellis and Phelps (2000), ICT is changing the traditional university academic work from a transmission of information model to a collaborative team-based approach for both the learner and the lecturer. ICT is changing the dynamics of university classrooms in developed countries by shifting the once held belief that teacher knowledge is superior and they are the transmitters of all knowledge, towards a more student-centred learning environment where teachers and students learn and explore things together.

Integrating ICT into the learning program requires funding. As such, many universities have allocated funding for software, hardware and staff training programs, (Collis, 1996; McNaught, 2001; Murphy, 2000). Again, lecturers who are committed to learning about ICT need training to gain the skills, knowledge and confidence in the process of re-thinking and re-designing their online courses (Koppi et al, 2002; Palloff & Pratt, 2000).

Lieberman (2000), emphasised that staff training and development is essential in terms of both learning and handling technologies in the learning environment because:

...technologies alone cannot provide solutions to teaching and learning problems and needs. Neither can technologies themselves transform teaching, learning and assessment. Transformation comes from re-structuring or re-designing of existing teaching and learning practice with incorporation of technologies (Lieberman, 2000, p.223).

The potential and value of ICT in learning is enormous, but this depends on the skills and attitudes of lecturers. Pearson (1999), reported that ICT in recent years has placed a greater emphasis on lecturers' facilitation skills. On the other hand, Barnett (2003) argues that emphasis should be on lecturers getting involved in ICT training programs because by gaining the skills and knowledge in the use of ICT lecturers can develop an understanding of their real role as facilitators in the e-Learning environment. Integrating technology into the learning environment requires teachers to restructure the content of their subjects and to rethink about the methodology that would suit the variety of contemporary pedagogies, resources and skills that will provide active learning for their students (Lieberman 2000; Charp, 2002; Wood & Smith, 2001).

Kemelfield (2002) reported that developing and implementing teaching and learning strategies in higher education is a process that is becoming quite complex, simply because academics have to really define the learning activities instead of just transferring their conventional notes into the e-Learning environment. For example, vocational and higher educational institutions expect academic programs to be of a high quality, flexible and responsive to the needs of students, (Sims & Jones, 2002). These authors further stated that:

...academic staff are continually being challenged with new teaching and learning paradigms. These learning paradigms challenge teachers to employ new pedagogical methods and new ways of thinking and doing things (Sims & Jones, 2002, p.10).

In essence the shift to e-Learning poses enormous challenges to academics, as they are expected to use their best teaching in the cyberspace classroom and ‘...those practices are the basis for what we term "electronic pedagogy or the art of teaching online’ (Wenger, 1998, p.11). Technology integration for lecturers is not only deciding if and when technological tools should be used but also how to provide the appropriate implementation method (Morrison & Lowther, 2002; Roblyer & Knezek, 2003, Shelly et al, 2004). Palloff and Pratt (1999) argued that training academics to use technology means assisting them see better ways of organizing and delivering learning materials. In supporting this statement, McDonald and Postle (1999) claimed that, while technology can enable learning opportunities, it is the teachers’ careful planning and incorporation of instructional strategies that contribute to student interaction, growth and learning.

ICT Support Unit

Most higher educational institutions have created staff support units where professional and technical support and advice, relating to developing effective online teaching and learning, is given to academic staff members. In an attempt to equip lecturers with basic technological skills and knowledge some universities have set up Information Technology Centres where technological assistance is made available to lecturers and staff on an ongoing basis. In addition, universities are also conducting staff professional development programs to assist lecturers master the basic technological skills that are needed in an online environment (Collis, 1996; McNaught, 2001). Table 2.2 shows an example of a support services department set up by the University of Wollongong, in Australia.

The staff support unit is known as CEDIR (Centre of Educational Development and Interactive Resources) and its purpose is to provide ICT support and training to academic staff at the university. CEDIR plays a very active role in ensuring that the university staff, especially the lecturers, are supported and equipped with the skills and knowledge to provide quality learning using the most recent technology.

Institution	Support available
University of Wollongong	<ul style="list-style-type: none"> • Runs free basic IT training courses for all staff. • Works with groups or individuals in designing online courses. • Available to all staff, anyone who requires support to develop teaching materials. • A Faculty agreement form is filled out, the Dean or Faculty Education Committee Chairman ranks all submissions in order of priority and importance before submitting to CEDIR. <p>Listed below are the programs offered by CEDIR.</p> <ul style="list-style-type: none"> • Staff development in Teaching and Learning. • Educational Resource Development. • Quality Improvement of Teaching. • Audiovisual Support and Teaching Spaces. • E-Teaching Support. • Learning, Innovation and Future Technologies. • Teaching Innovation Support. <p>http://cedir.uow.edu.au/CEDIR</p>

Table 2.2. Example of an ICT support unit
(Information used with permission)

The main aim of CEDIR is to ‘...facilitate and support continuous development of high quality teaching and learning practices, products and services...’ (<http://cedir.uow.edu.au/>), for the whole community. Many universities have established strong staff development and support units like that of CEDIR (McNaught et al, 2000). These support units usually have experienced and highly qualified staff members such as programmers, website designers, graphic designers, computer technologists, instructional or learning designers, visual and audio specialists etc.

Support for ICT comes from different sources. It could be from an established department like CEDIR or might only involve a lecturer collaborating with one or two IDs to develop an online learning course. Establishing staff support units is an excellent idea but it cannot really cater for an individual lecturer’s demands especially if projects have to be prioritised and screened by the Dean or the chairperson (Lambert, 2003; McNaught, 2001). However, for IDs to support an

individual or a group of academics does encourage them to use technology (Lambert, 2003).

Studies have shown that members of design teams continually evaluate their work and often conduct research to improve their design work or alter their design methods and techniques. McGriff (2001, p.312) mentioned that for higher institutions to make full use of the potential of ICT in teaching and learning, they have to conduct more research to assist them take a ‘...hard strategic look into how their delivery of instruction conflicts with the cognitive potentials of contemporary information technologies.’ In addition, McNaught (2001) asserted that research has to be done because the design of many on-line learning environments seems to fail to take advantage of the learning opportunities that the new technologies offer and support and as such, they do not provide the quality learning that they claim. Lack of technological support and organizational plans for the use of ICT often causes lecturers to develop e-Learning courses which only duplicate what is taught in a conventional class, (Dehoney & Reeves, 1999). Bostok (1997, p.229) concluded that: ‘...simply placing lecture content on web pages gives flexible access, but makes no contributions to active learning ...’ Furthermore, Hedberg, Brown and Arrighi (1997) claimed that simply allowing the user to choose between pages of cute animations cannot be classified as interactivity. Online learning emphasises a user-centred approach and this should be reflected in the created online environment where learning tasks are designed to challenge users to take control of their own learning.

Despite the negative reports about the use of technology, many tertiary institutions have realized the vast potential of technology and are currently re-evaluating their online courses for quality assurance purposes (Peat et al, 2001; Taylor & Richardson, 2001; Kemelfield, 2002; Murphy, 2000; Wood & Smith, 2001). These educational institutions have also developed professional staff training and support programs as stated earlier, with an aim to assist lecturers produce effective and quality computer-based learning resources (Lieberman, 2000; Gray & McNaught, 2001).

Cunningham (2004) added that technology has altered the methods of teaching and learning for both learners and lecturers. Further support for this claim comes from Torrisi-Steele & Davis (2000, p.29) in stating that:

Recent advancements in technology have dramatically increased the capabilities and accessibility of online learning environments. It is also undeniable that online technology changes are parallel.

New technologies (software & hardware) are changing the learning environment and some lecturers have embraced the opportunity of using technology to innovate and improve their teaching styles. Despite growing enthusiasm among some university lecturers, there are still lecturers who need ICT assistance and are yet to truly experience the power of ICT in the learning environment.

Furthermore, the concept of developing effective and challenging activities using technology can be a threat to lecturers and that is where ongoing support and encouragement is required to help them understand its potential and actually integrate it in their teaching (King, 2002; McGriff, 2001; Liu et al., 2002). Lecturers require assistance from IDs who have the technical knowledge and skills to support and guide them to create new learning opportunities in an exciting and challenging way (Kozma, 2000; Radloff, 2001; Kemelfield, 2002). This is the very reason why most universities have set up ICT support units or departments to provide ICT training to the academic staff members at their institution.

Ongoing support from different sources, including IDs and other computer specialists, is commonly used to encourage and prepare lecturers to employ ICT to enhance their teaching. There are a variety of new technological tools that can be utilized by lecturers (Copper, 2002; Youngblood et al, 2001; Oliver, 1998) to support learning, however, selecting the suitable software to use in the learning environment will also require assistance from an ID or from other technical experts (McGriff, 2001; Torrisi-Steele & Davis, 2000), especially if lecturers are novices in using ICT for learning purposes.

2.3 Effective and Quality e-Learning

There is not a clearcut definition of effective and quality e-Learning environments. Different people have voiced their own opinions and explanations about effective and quality learning courses, and recent studies have shown that the effectiveness and quality e-Learning is measured in a variety of ways, (Agostinho et al., 2002; Laycock & Nowland, 2000; Wood & Smith, 2001; Department of Education, Science and Training, 2002). Although there are a

number of frameworks, guidelines and ‘policies’ set by individual universities or Education Ministries, they are intended to guide Instructional Designers (IDs) and lecturers in the design of effective learning tasks.

Gunn (2001, p.253) otherwise suggests that ‘development of various forms of online courses and activities has brought the higher education community to a point where attributes and criteria for effective online teaching can be formally and reliably identified’. The literature records many frameworks used by higher education institutions, and several claim that these are different but clear characteristics of an effective online learning environment that result in learning outcomes which are more effective than conventional learning environment (Collis, 1996; Salmon 2000; Goodyear & Salmon, 2002; McNaught 2001; Martin et al., 2003).

Gunn strongly argued that knowing what effective online learning is will ‘provide a useful starting point for further analysis of the issues that determine the quality of online learning and teaching’ (Gunn, 2001, p. 253). Ellis et al., (2001) saw that quality learning online depends on how the online components are situated in relation to the learning outcomes of the whole curriculum. Online learning requires a different mindset for people involved in the design process, such as lecturers, IDs, researchers and students who may be involved in it. Effectiveness of the online learning environment starts right at the beginning of the design process. Reeves (1999) pointed out that designers (IDs and lecturers) today are challenged to design activities that will provoke intelligent responses from the learner and that this can be achieved only if ICT training programs are established and supported by the administration and technical people.

Studies have also shown some negative impacts of technology in learning. For instance, McNaught (2001) claimed that technology does not always cater for diverse student learning styles. Greening (1998) added that learning driven by technology is ineffective, that learning should be driven by theory and not technology. Windschitl (1998) mentioned that technology could make learning complicated and time consuming as learners search for specific information amongst the vast amount of information that is often linked to an online course.

Sims, Dobb and Hand (2002) argued that to have quality in online learning, lecturers and designers need a framework or evaluation tool to evaluate their work right from the beginning and they should take time to assess their reasons for putting their subject content online. Secondly, they need to evaluate the strategies used in the development process and finally evaluate the learning outcome. Formative and summative evaluation should be employed throughout the design process by designers (Laycock & Nowlan, 2000; Reeves, 1997). Despite the fact that different evaluation instruments are being used to assess the effectiveness of online learning, no one can claim that their evaluation instrument is the best, because learners and lecturers experiences can be interpreted differently. However, Reeves (1997), expressed that regardless of the different evaluation tools used by designers, their aim should be to see that ICT supports meaningful learning.

Quality Assurance

Most studies conducted today focus on improving the quality of online courses. Quality, according to Garvin (1988), is difficult to define: it is not about having no defects in a process, it is about identifying ways and means of improving a process in order to achieve predictable positive results. Walklin (1992) mentioned that organizations (including educational institutions) use different approaches to achieve quality in their end product and one of these approaches is known as quality assurance. Quality assurance was defined by the Australian Vice-Chancellors' Committee (2000) as '...the policies, attitudes, actions and procedures necessary to ensure that quality is being maintained and enhanced' (Australian Vice-Chancellors Committee, 2000, p.46). In addition, Nichols (2002) described quality assurance as '...a journey rather than a destination,' which could be interpreted according to Harman and Meek (2000, p.vi) as '...system management and assessment procedures...' which ensure that the final output contained the required quality of the product. In support to this explanation, Kenny and McNaught (2000) gave a more precise definition of quality assurance, as a system that equally treats, plans, controls, implements and continuously checks its system procedure to ensure that the quality of their product is maintained according to set policies. Copper (2002) stated that, '...the purpose of quality assurance measures is to demonstrate quality of a product or process' (Copper, 2002, p.159).

Most universities have developed quality assurance systems to guide them as they plan and design online learning environments. Some researchers (DETYA, 2002; Nichols, 2002; Hedberg, 2002; Cooper, 2002) have expressed the view that in order to achieve quality in online courses, designers (IDs and lecturers) have to follow a set framework, criteria, policy or checklist to assist them plan and design effective online learning materials. As such, McNaught (2001) reported that Royal Melbourne Institute of Technology (RMIT) has developed a university-wide quality assurance system for all online courses they offer. This policy requires all online courses to be signed off by the faculty Director of Teaching Quality (DoTQ). The online approval process ‘...basically asks staff to show evidence of some educational planning before their subjects become live’ (2001, p.438).

Nichols (2002) mentioned that quality assurance policies and documents for e-Learning are available in most education systems, but it is yet to be adopted into each situation. His report indicated that creating quality assurance procedures for their e-Learning was time consuming, but at the end they were able to create four distinct quality assurance procedures and they are: the training process, the consultancy and training process, the full project process and the single task project process. Most of these quality assurance guidelines are being carried out by educational institutions. For example, some institutions have taken the time to reflect on the results of their projects, which gives them the opportunity to ‘review and alter their policies and quality assurance procedure,’ (Nichols, 2002, p.10).

The integration of technology into learning and teaching is best supported by setting up policies and frameworks which will embed best practice and relevant pedagogical methods as lecturers learn and use technology in the online environment (Collis, 1996; Grabinger and Duplap, 1995; McNaught, et al., 2000). Having policies and guidelines for online design and development does assist the designers in the development process. On the other hand, Mishra et al (2002, p.7) agreed that there must be policies and guidelines for designing online learning, but argued that having a set framework for designing online learning does not always produce effective and quality online learning environments. From their experiences they discovered that using a framework does not allow novices to

fully express their best teaching practices because they tend to use other people's ideas. Preparing lecturers to use technology means providing the best methods of designing the content and activities that have been used in the conventional learning style into the new method of teaching using ICT. In most cases the IDs should be the best people to assist because they have the knowledge and experience to suggest the most appropriate methods of presenting the learning tasks in the online environment (King et al., 2000).

Wood and Smith (2001) suggest that it is important for every designing team to understand the policies or framework on the use of ICT in their institutions and work within those guidelines to create their learning environments. Hedberg (2002) cautioned that 'e-Learning will go the way of previous technologies unless there are changes to the design framework used as the starting point' (Hedberg, 2002, p.2). It is true that ICT has a lot of potential but all academics are yet to realise its value and benefit from it.

Attributes of ICT in learning

In order for lecturers to use technology effectively in their teaching, they have to acquire new skills and knowledge to assist them to design different types of activities that would link learning to the real world. Designing learning tasks can be a challenge and certain attributes have been set to assist learners. Table 2.3 shows the different attributes outlined by Jonassen, et al., (1999), Reigeluth (1999) and Wagner (1997).

The lists of attributes in Table 2.3 are very similar in nature. They all emphasise creativity, learner control, motivation, participation, and authentic or real-life activities. These attributes are reflected in most of the recent studies carried out by either lecturers, IDs, the designing team or the funding agents. Designing learning tasks requires special skills from both IDs and lecturers.

Author	Attributes, values and guidelines as basis for using ICT
Jonassen (1999)	<ul style="list-style-type: none"> • Learning environment is active - requires students' participation in processing information. • Constructive – students are encouraged to integrate new knowledge into their prior knowledge. • Collaborative – students work in learning communities.

	<ul style="list-style-type: none"> • Conversational – students share ideas, build upon each other’s knowledge • Contextualised or situated in real world task or problem-solving activities. • Intentional -students are made aware of cognitive goals and objectives at the onset. • Reflective – students are encouraged to reflect on the process and articulate what they have learned.
Reigeluth (1999)	<ul style="list-style-type: none"> • Success, volition, value and enjoyment motivates adults to learn. • Higher-order thinking skills and complex cognitive tasks are best fostered when learners interact socially to construct meaning. • Instruction should provide variety. • Instruction should foster creativity. • Instruction should be authentic and relevant to the learner. • Instruction should be linked to prior knowledge of the learner. • Use resources that learners can access. • Instruction should provide cognitive and social support. • Encourage all learners to participate. • Avoid providing an overload of cognitive learning tasks. • Learners should control their own learning.
Wagner (1997) Emphasised that the design should consider the interaction process.	<ul style="list-style-type: none"> • Increase participation and engage learners. • Increase social interaction, through communication/discussion. • Enhance elaboration and retention. • Support learners as they work through the tasks. • Increase motivation. • Support teamwork among learners. • To explore, discover and understand concepts in the learning environment.

Table 2.3. Attributes of using ICT in learning

The attributes above are set as guidelines and were set up to assist IDs and lecturers design high quality online learning in their own institutions. These attributes can assist any group or design team as they contemplate designing their online courses.

Many lecturers and designers have created excellent and high quality courses that contain most of the attributes listed in Table 2.3, shown above. These e-Learning courses provide challenging and authentic or real-life situation tasks. For example, Keppell (2002) reported on a multimedia project that had a visual dental clinic that assisted dental students learn the process of dealing with diabetic dental patients. This project was successful when it was first used and only a few minor instructional issues emerged. These were addressed in time for the next cohort of students. The designers learnt a great deal from the developmental process and were using similar design techniques in other courses within the university. Keppell (2003) pointed out that quality learning today requires experts from different universities, organizations and people in the same field to

collaborate and contribute their ideas, experiences and advice in designing a particular learning project.

Another study by Knowles, Knuz and Tarnowska (2003), reports that some of the learning tasks that are designed today can serve multi-purposes and could be used by learners in the educational institutions, as well as the general public. People often combine their efforts since they believe that high quality learning experiences can be developed when subject experts (lecturers) collaborate to design online learning materials (Richard et al, 1997). Hedberg et al., (2002) stated that effective and quality online learning resources, methods and ideas should be shared with other lecturers and designers. Furthermore, online learning resources, templates and design could be adapted to other learning situations.

The emphasis on quality assurance is a common concern in many universities. For example: universities in Australia are responsible for the quality of their own academic standards, but their online courses have to have certain qualities which is set out by the Australian Quality Assurance Framework (DEYTA, 2000). This shows that the emphasis on quality assurance goes beyond the boundaries of each university because it involves external funding bodies, State Accreditation Boards and the Australian Universities Quality Agency Audits. Continuous research is being carried out to help evaluate, assess and improve the policies and framework of developing quality online courses (DEYTA, 2000).

A case study done by the Institute of Higher Education Policy (DEST, 2000) on six US higher education institutions reported the benchmarks for success in Internet-based distance education. This study identified 45 benchmarks that were seen as essential and others not essential for online learning. Seven of these *essential* benchmarks are listed (p.35) because they are considered suitable for guiding online designers in any educational institution and they are:

1. Clear planning.
2. Robust and reliable infrastructure.
3. Good support systems for staff and students, including training and written information.
4. Good channels of communication between staff and students.
5. Regular feedback to students on their learning.

6. Clear standards for courseware development.
7. Ongoing evaluation processes with a strong student input.

The number of essential benchmarks confirms that quality and successful online courses do not automatically happen because technology is used; careful planning also has to occur (Taylor & Richardson, 2001). Gunn (2001) added that an effective and quality online learning environment is likely to occur when higher educational institutions take a holistic approach in designing online subjects. This view is further supported in the report by IHEP (2000) which suggested that the holistic approach considers every factor that contributes to education, such as institutional support, course development, teaching and learning, course structure, student support, staff support and evaluation and assessment.

The Australian Universities Teaching Committee funded a project designed to assess quality e-Learning courses. The aim was to identify and produce generic e-Learning resources that would assist lecturers to develop effective and quality learning activities for the learner. The project used the four criteria for quality learning proposed by Thornburg (1991). The four criteria were:

- Engagement of learners.
- Acknowledgement of the learning context.
- Challenging learners.
- Providing practice.

The four criteria guided the team members in preparing the evaluation instrument evaluation and redevelopment framework (ERF) that was used by participants to evaluate the quality of certain online courses. That report agreed with the previous studies (Wood & George, 2003; Laycock & Nowlan, 2000) which confirmed that academics need evaluation tools to help them assess the quality of their online learning environments. Agostinho et al (2002, p.7) concluded that:

Academics in higher education face the ongoing push to implement ICT in their teaching, not only is there a need for professional development to assist them to design and implement effective ICT-based learning environments, but there is a pressing need to provide them with tools to assist them to assess whether their learning designs can be or are indeed, effective.

Essentially, this study focuses on three of those factors (course development, staff support and evaluation) with an aim to understanding the collaborative strategies

that would guide IDs and lecturers to design quality online subjects, while providing assistance to assist lecturers comfortably apply technology in the development of their online subjects.

Effective e-Learning courses are those that are well planned and organized, (Carlise, 2002). In support of this, a study by participating universities conducted by Franklin (2002) in the USA employed the following elements (learning effectiveness, cost effectiveness, access, faculty satisfaction and student satisfaction) as the basis of creating their e-Learning courses. The result reported by each university showed positive and overwhelming evidence of satisfaction by the users of their online environments. The report supports the concept of using a set framework or policy to design quality online learning environments. Sharp, Conole and Beharrel (2001) contend that there must be pedagogical guiding principles or framework to assist designers and lecturers plan and create effective online courses. They further indicated that the process of evaluating appropriate materials to be used in an online subject does take a lot of time, but use of a pedagogical framework or a set of criteria or policy guides the designing team or individuals to develop appropriate, challenging and authentic (real-life situation) activities that provide meaningful and practical learning. Another challenge for academics is to use the most suitable method that will assist them to assess learning outcomes in their e-Learning environment, such as: cognitive, performance, portfolio and authentic assessment (Koppi & Pearson, 2002). These challenges can be met if they have access to experienced technical support.

Changes in learning

It still is clear from the literature that all educational institutions, organizations, committees and individual lecturers and their teams are focused on developing effective and quality online learning for their students. Most of the quoted studies are on large scale but this study will focus on two teams who aim to develop effective and quality online resources for both face-to-face and distance students.

2.4 E-Learning and Lecturers

With the use of ICT in education, lecturers are expected to be equipped with basic ICT skills that will enable them to integrate technology to support and enhance learning in their subjects. For many lecturers the increasing emphasis on the use

of ICT for research and teaching can be threatening. These fears can be eased if universities put in place training programs or professional staff development plans that would encourage, train and motivate staff to confidently use ICT in their teaching. Ellis and Phelps (2000) pointed out that some lecturers have welcomed and accepted (early adopters) online learning while others are slow in adopting the culture of technology and how they can use it. McLoughlin (2002) argued that ICT is seen as potentially the best method of teaching and learning which helps to cater for the predicted increased enrolment at university level. Winn (1990) argued that ICT has altered learning and increasingly higher education institutions are being asked by organizations, industries and the government to produce graduates with certain skills and requirements such as working in teams, problem solving, communication skills, understanding and using technology. Such pressure has challenged academics to re-assess their subjects and work with computer experts to develop more generic (Luca and Oliver, 2002) and authentic learning tasks (Bennett, Harper and Hedberg, 2002; Keppell, 2003; Herrington & Oliver, 2000).

Challenges for lecturers

Technology has opened up different learning opportunities for students and has created a challenging role for teachers to carefully plan and incorporate learning instructions that would contribute to learners' interaction, growth and learning (Reeves, 1997, Grabe & Grabe, 2004).

Lecturers as well as tutors at universities are being encouraged to become familiar with technology because they are the agents of change that will motivate students to use new tools and methods in learning (Biggs, 1999; Gunn, 2001.). The trend of using ICT has led some universities to put in place professional staff development programs to assist lecturers develop their skills of using ICT in the online learning environment (McNaught, 2001, p.218). McNaught goes on to say that, '...staff development programs that are successful in meeting the needs of complex modern Australian universities need to be supported strategically and financially by their own universities.' As such, some institutions have encouraged and coached the lecturers in one entire department or faculty to experience the capabilities of online learning through staff support services before actually applying these skills in their own online subjects (Collis, 1996; Torrisi-Steele &

Davis, 2000). The decision on when to support and train lecturers depends on the administration, faculty and even computer experts in each project. As technology becomes more main-stream, support services need to be scaled up. We are in a time of rapid technological change and therefore it is important that professional development support be flexible, appropriate and adaptable. Gray and McNaught (2001) stated that:

online technology and its educational implications challenge many staff to review their attitudes to their own teaching, and working with online learning technology lends itself to a team-oriented, collegial approach to developing and operating academic programs (Gray & McNaught, 2001, p.217).

This implies that ongoing support is the best way to develop lecturers' confidence to use ICT on their own for educational purposes.

Many lecturers are reluctant to learn the details of working with technology, because they think that the training process on how to use technology would only take up a lot of their working time. Thompson and Rodriguez (2003) saw that successful integration of technology involves four key components and they are: content (subject content), technology (board, chalk, online learning etc), representation (how the learning is presented – text, multimedia) and pedagogy (combination everything). These four components indicate that technology requires lecturers to think more deeply about the design structure and task for the learners. However, the most constraining pressure is the expectation of education policy that such intensive re-cycling of the pedagogy should be effective with the normally assigned workloads of teaching staff. Perhaps a review of that policy would more effectively produce less of an accumulating stress, therefore better teachers and subsequently students.

Lecturer skills & expertise

Over the years universities have been trying different methods of assisting academics to integrate technology into their subjects. Some universities have actually set up policies to guide academics and computer experts to work together in designing online learning environments. Others like the Michigan State University took a different approach (Mishra et al, 2002). In that case, academics were required to prepare the subject content, while the technical experts had to develop the online design of the course. When this was done it was then given to

a person known as the producer to combine the two to form a subject. They admitted at the end that this trend affected the pedagogy. Lemke (2003) argued that lecturers should be allowed to bring their individual teaching style into the online learning environment. Phelps et al., (2000), emphasised that academics own the intellectual property right of their subjects, so it is important in terms of the ongoing sustainability of online units to include them in the design process. Lemke (2003) concluded that it is not enough for academic staff to hand over technical dimensions of their unit development to administrative or technical staff. Instead they should collaboratively work with the technical staff so they could learn the skills, gain confidence and motivation to assist them undertake their own maintenance and updating of their units during the delivery process.

Martin et al (2003) argue that academics need to be involved in the design process so they would learn to negotiate the interactions between the content, pedagogy and technology from the experienced technical experts. On the other hand, Mishra et al (1994) reported from their study that not all academics were willingly to take up the challenge of using ICT; some were reluctant at first but after listening to their colleagues' experiences, they gained the courage to work in teams with some senior students to develop their online courses. Their project began by assigning individual roles, before commencing the task of wrestling with the important issues of technology, content and pedagogy. Training workshops also assisted the academics especially and as a result the team designed effective online subjects, which they were very satisfied with.

Lieberman (2000) warned that teaching in an online environment is a completely different process to conventional teaching and requires changes to lecturers' pedagogical practices. Holt and Thompson (1998, p.198) stated that:

...although many of the skills which teaching staff have acquired in the past may be transferable to the new context, there is also the urgent need to develop in staff the skills and the knowledge required to exploit potential teaching and learning advantages of the new medium.

Higher educational institutions today have to ensure that teachers are equipped with the appropriate expertise and skills for teaching as well as for designing and developing online learning environments (Oliver, 1998). Ellis and Phelps (2000) added that training of academics must incorporate both technical skills and pedagogy, but the challenge is to help them master the new teaching methods and

avoid the problem of transferring their existing and poor teaching practices to the online learning environment (Bates, 2000; Oliver, 1998).

Different approaches have been taken by higher educational institutions to prepare and train academics, such as running workshops and seminars for academics, providing individual consultation, and grants for improving instructional designs, resource materials such as books and newsletter and allocating funds to hire technical experts (King et al., 2000) to provide needed training. Koppi and Pearson (2002) suggested that different people should be involved in the training and design process because their experiences, skills, interest and knowledge will assist the team to exchange and form quality learning resources and methods that would assist academics.

In support of the idea above, Mishra et al (2002, p.18) emphasised that:

teaching online courses requires a level of familiarity and comfort with technology that many faculty members still lack. Although faculty members were the 'content experts' they were not the technology experts. Consequently, developing an online course required collaboration with individuals who are experts in technology.

Having different technical experts to work with academics in a team has a lot of benefits because academics can learn technical ideas directly from the experts, which encourages them to re-assess their attitudes towards technology and pedagogy. The greatest challenge is to create quality student-centred learning environments.

Facilitator and Collaborator

The literature reports that e-Learning environments today are tending to be more student-centred and aim to use authentic learning activities (Bennett et al, 2002; Herrington et al, 2000; Crawford, 2002). Students are required to control their own learning while lecturers act as facilitators in the learning process. Some lecturers today still require ongoing technical support from IDs and other experts to help them understand the shift in pedagogy and to become effective facilitators (Jawah & Northcote, 2002). Understanding the pedagogy of any teaching approach is critical in the delivery of quality learning opportunities for students.

Lecturers who use and support online learning are fully aware of the shift in pedagogy of online education, but they still have to be prepared to confront the challenges of thinking through new designs and structures for meaningful teaching and learning (Muffoletto, 2002). On the other hand, Bitner and Bitner (2002) posited that teachers often lack good models/frameworks to emulate for effective integration of technology into the curriculum. This is why they require ongoing support from technology experts to assist them use the full potential of technology to enhance learning.

Bitner and Bitner (2002) proposed that an often-overlooked but crucial determinant of whether technology succeeds or fails in the classroom depends on the capabilities of the teacher/lecturer. Technology on its own does not bring quality and effective learning so training teachers to be skilled in using technology is the only way to improve the learning and teaching resources. Lonergan (2001) argued that, “although most teachers are familiar with computers, many do not incorporate computer skills into classroom instruction”. Therefore, teachers, whether they be pre-service or in-service should be provided with examples and activity models to assist them experience the potential of technology in their teaching and learning. Lonergan (2001) made the following recommendations to assist teachers.

- Focus institutional technology planning on the integration of technology in teaching and learning, not only on facilities.
- Provide opportunities for the teacher to apply technology in their teaching.
- Provide faculties with the tools, incentives and professional development that will enable them to integrate technology into the curriculum.

He further stated that, ‘...teachers share common knowledge based in educational theory as well as powerful perspectives in regards to what typifies appropriate instruction’ (Lonergan, 2001, p.2). Teachers feel a great deal of ownership regarding the content of their subjects, thus actually involving them in the design process gives them more confidence to learn about the different ways that technology could be used to support learning.

2.5 Instructional Design

Instructional design practices have their roots in a very behaviourist tradition where the theory of the linear model was seen in the advent of different theories concerning programmed instruction. For example, Glaser (1990) synthesised the work of previous researchers and introduced the concept of instructional design. Gagne, Briggs and Wagner (1992) focused on the practice of effectively designing events of instruction, Dick and Carey (1990) looked at the systems approach for designing instruction and outlined a simple instructional design model for teachers/lecturers to apply when designing instruction for learning, while Briggs et al, (1991) focused on instructional objectives. Wilson (1997) stated that ‘Instructional Design theories serve as a guide to professional practice. Conceptually, ...they are about how to get something done, how to design a solution, ... for problem solving’.

<http://carbon.cudenver.edu/~bwilson/construct.html>. Rassmussen (2002, p.377) described the role of instructional design and technology as follows: (1) professional foundations (including research and theory), (2) planning and analysis, (3) design, (4) development, (5) utilisation, (6) evaluation and (7) management. Those responsible to perform different tasks in instructional design are lecturers, IDs, support staff, educational designer, quality control expert, project co-ordinator, trainer, evaluator and subject developer. Instructional design according to Pan (2003) refers to a formalised model of instructions used in specific aspects of learning. For example, in an educational setting IDs and lecturers begins the instructional design process involves stages such as, (1) planning (2) developing, (3) implementing and (4) evaluating. The process is then repeated with an aim to improve the quality of the design process. Ceraulo (2003) outlined the definitions of instructional design in Table 2.4.

Definition	Explanation
Instructional Design as a Process.	It is the entire process of analysis of learning needs and goals and the development of a delivery system to meet those needs.
Instructional Design as a Discipline.	Carries out research and theory concerning the instructional strategies and the process used in

	developing and implementing those strategies.
Instructional Design as a Science.	It is the science of creating detailed specifications for the development, implementation, evaluation and maintenance of situations that facilitate learning.

Table 2.4 : Definitions of instructional design

This study will employ the first definition in Table 2.4 above, because participants (lecturers and IDs) will be analysing the learning needs and goals and develop e-Learning resources and activities to achieve their goals.

2.6 Instructional Designers

Instructional Designers (IDs) come from all disciplines and domains. There are many different career paths that they follow, including, multimedia development, program evaluation, technology specialist, ICT consultant, graphic designers, web designers, etc. The field itself is rooted in Education, Psychology and Communications. Another definition of ID is:

‘Instructional designers have extensive knowledge of education and multimedia design. Experience in teaching, research, consultancy and multimedia production in commercial and academic environments, inform the design of materials that are both highly innovative and educationally sound.

<http://www.tedi.uq.edu.au/edResources/how-teamRoels.html>

In an attempt to define the term instructional designer, Liu et al., (2002, p.24) explained:

The term instructional designer is less familiar outside the field of instructional technology. Instead ... job titles such as industrial designer, curriculum developer, learning specialist, instructional technologist or project manager. Yet people of these titles are often carrying the responsibilities of an instructional designer. These are some of the many different names used in describing the role of IT experts or technical people.

Schwieb, Campbell and Kenny (2004) concluded from their study that an IDs promote collaborative engagement among participants in McGriff (2001, p.312) stated that:

The instructional designer is one of the best prepared education professionals to provide training in skills that are essential for teaching and learning with technology, to provide support during the instructional development process, and to offer

pedagogically sound guidance for the effective integration of media and information technologies. ... instructional designers can play a key leadership role in the transformation of higher education.

In addition, Liu et al (2002) stated that instructional designer is the title given to the person who plans instruction and uses cognitive strategies to create activities that will challenge students to be more involved in the learning process. They further noted that the term ID 'is less familiar outside the field of technology' where other titles are used, such as educational designer, learning designer, learning technologist, instructional technologist etc. Regardless of the title, it is clear that the role of an ID is very important when integrating technology into the teaching and learning environment.

2.7 Role of Instructional Designers

Ideally Instructional Designers (IDs) are people who have the experience and expertise to assist lecturers, subject matter experts and academics to develop online courses and computer-based learning resources, which they believe will produce quality learning (Keppell, 2000). In addition, King et al., (2000, p.2), noted that IDs as computer experts '...are focused on best teaching practice and in assisting faculty meet students needs using the most appropriate and effective tools, resources and strategies available and they also tend to focus on pedagogical issues...' when planning and designing e-Learning materials.

Another description of

'The role of Instructional Designers is to design educational resources in collaboration with clients and to facilitate the resource development process... provide support to the academic development team in designing and developing courses and units that effectively and efficiently meet the needs of the learner target.

<http://www.tedi.uq.edu.au/edResources/how-teamRoles.htm>.

Knowles, Kunz and Tarnowska (2003, p.639), believed that the '...design process usually starts with a learning requirements analysis...' and that is where the ID is required to work with the academic in identifying the aims of the course as well as the expected results in learning outcomes.

In addition, Knowles, Kunz and Tarnowska (2003) added that IDs do have a very special role to play in the design process. For example, most of the academic

members in their design team doubted that their unique teaching styles could be shown in the virtual learning environment. Such statements indicated that not all lecturers understand that IDs have the skills and knowledge to assist develop interactive learning environments that represent the ideas of academics. Torrisi-Steele and Davis (2000, p5) used another definition, educational designer, to describe the similar roles that IDs do. 'The educational designer's role is the provision of support and advice in the design, development and use of electronic (including online) and print media used for teaching and learning.'

They outlined the type of advice that educational designers would offer to academics:

- 'The range of options available and the most appropriate technology to meet the needs of the target audience and achieve the purpose and desired outcomes.'
- 'Advantages and disadvantages of particular media.'
- 'The integration of various resources with other teaching strategies to assist in the creation of a wide variety of flexible learning environments.'
- 'Effective design of learning resources including multimedia, print based and audio and video resources to enhance student outcomes.'

Other researchers like Price and Schlag (2002) used terms like Course Developer in place of ID and Subject Matter Experts (SME) instead of lecturer (Keppell, 2000). Price and Schlag argued that Course Developers or IDs are the ones that should provide easy-to-use course design templates for developing online learning environments. In addition, Keppell (2000) stated that SMEs or lecturers should be shown different online learning environments as samples of different activities, and pedagogical ideas that can be used in online learning environments. Gray and McNaught (2001) agreed that lecturers in different universities need to share their successful technological ideas and methods, as an example to assist their colleagues and other lecturers see better ways of doing things.

Challenges IDs face

Instructional designers, according to Muffoletto (2002), face a range of challenges from lecturers who come with their ideas on what they would like students to experience in their online subjects. Such challenges require IDs to

understand the different perspectives, theories and how they relate to the different values and knowledge in each subject. Keppell (2000, p.4) explained that ‘many projects have failed due to an inappropriate consideration of what the client/SME (ID/lecturer) expects from the project’. He emphasised that IDs should have a very close working relationship with lecturers in order to achieve the expected outcome in the design process. Although there are no set models or guidelines for IDs and lecturers to use as they collaborate in the design process, a few models that have been suggested by some researchers have been proven to be useful (Keppell, 2000). For example, the use of concept maps by Novak and Gown (1984) assists IDs to link concepts in a way that will represent the lecturer’s thoughts, ideas and plans. Another strategy suggested by Barron (1980) is the use of graphic organisers that IDs use to visually represent the main ideas of the subject content as described by the lecturer. Lambiotte, et al (1989) introduced the knowledge map concept which IDs could use to define links between concepts as outlined by the lecturer.

Lecturers usually know what they want (and wish to have) in the learning process, but the challenge is to be engaged in a good working relationship with IDs, where they can communicate freely, by asking questions and understanding each other’s role and expectation as they collaborate as a team in the design process. The team members in this project will use some form of design maps, models or frameworks to assist the two IDs understand what the lecturers require and want.

Thornburg (1991, p.12) argued that, despite IDs having no content expertise, one of their main job ‘is to select, sequence, synthesise and summarise the content of instructional purposes’ as they aim to assist lecturers develop effective instructional materials. Apart from IDs, there are other specialists who are often involved in designing online courses, such as programmers, technologists, Internet specialists, Web designers and graphic designers.

However, this study only focuses on the role of IDs because they are the key people who work with lecturers from the planning stage to the development stage of e-Learning environments.

Instructional designers have a lot of experience in designing learning environments and their skills and knowledge improve each time because of the constant feedback they receive from the users (academics and learners), (Tripp, 1994). Every design job, according to Murphy (2000), has its own unique challenges but designers often encourage lecturers to plan more creative and interactive learning tasks and IDs would usually know the best way of presenting them in the e-Learning environment.

Squires, Grainne and Jacob (2000) argued that learning today is no longer structured in a systematic way as it was in the conventional setting. With this new form of learning, IDs are expected to foresee problems and find ways of solving them.

Lecturers whether they are novice or well experienced in e-Learning, still require continuous technical support and assistance from an ID with their subject. Novice lecturers in e-Learning would require an ID to support them right from the planning stage, whereas an experienced lecturer would require an ID's advice when selecting a software, or on how to re-design their e-Learning activities to improve their subjects.

King et al., (2000) argued that colleagues and educational institutions must have a position for an ID. The ID does not have to be a technical person, but must have the work experience, skills and knowledge about using a variety of software in learning. Having this knowledge is important because this will prepare them to guide lecturers in designing the learning structure, while the technical experts can direct other technical issues.

2.8 Staff development and team support

Staff development is widely recognised as being crucial in the successful introduction of technological innovation in teaching. Teachers (especially in developed countries) are under pressure from mandated curriculum to integrate ICT into their teaching and are being asked to model best practice while they are still learning about and how to use ICT (Ainley, et al., 2002). A support team, in most cases, consists of the ID(s) and technology specialists, the people who

support the faculty and lecturer in a collaborative way to develop their e-Learning environments (Jones, et al. 1999). Other major supporting components are the administration and other lecturers who share the same values, challenges, experiences and knowledge as they work together in finding solutions to successful e-Learning environment (Muffoletto 2002; Price & Schlag, 2002).

A successful working team is one that establishes a strong rapport among team members (Price & Schlag, 2002). Having a good rapport enables lecturers and IDs to freely discuss and have access to unlimited information that will assist them to understand each other in the design process (Keppell, 2000; White, 2000; Liu et al., 2002). One of the challenges for the designer team (lecturers and IDs) is to collaboratively plan suitable activities that will accommodate the diverse learning styles of the students using the most appropriate resources (Reushle & Dorman, 1999). While many of the ICT skill, lecturers have acquired in the past may be transferable to the new structure, there is also the urgent need to provide support for staff to develop the skills and knowledge required to exploit potential teaching and learning that is required in modern universities (Torrissi-Steele & Davis, 2000).

Team collaboration is paramount in creating effective, better quality, and successful e-Learning environments and this comes as a result of the contributions and inputs from different experts.

A growing body of literature revealed that staff development is required for e-Learning development and learning in universities (Ellis & Phelps, 2000; Bennett, Priest & Macpherson, 1999; Slay, 1999). Staff development means supporting and preparing academics to face the technology era (21st century). As such, Charp (2002, p.6) stated that:

Preparing teachers, especially in the use of technology, is an ongoing endeavour.

Preparing teachers for the 21st century, with the onrush of new technologies and the flood of multimedia products, requires a restructuring of content, rethinking of existing methodology and another look at existing assessment tools.

Such a statement indicates that staff development has the potential to transform lecturers' pedagogical practices. In support to this, Shannon and Doube (2004) stated that it will assist them to alter their teaching methods, class preparation, increase their confidence in using ICT in learning and prepare them in carrying out research work. Staff development programs cannot be done alone, but

require team effort. McNaught et al (2000) asserted that there are already staff development training programs being offered in most tertiary institutions, which focus on pedagogy and the use of ICT in the learning environment.

Murphy (2000) asserted that team collaboration can yield either positive or negative results and it does require delicate handling, especially at the beginning of a training session. If the team process is clumsily handled then it will only discourage participants, hurt their feelings and, worse still, end with a failed project. Projects have failed simply because team members did not have a good relationship and did not really understand their goals of learning about the potential of technology in learning.

Training programs

Preparing lecturers could be done in several ways; for example, staff development training programs can be provided to the entire faculty or to small groups of lecturers or to individuals, depending on the needs of lecturers. Charp (2002) also argued that if staff development programs are not effective then it is wise to involve only enthusiastic people who will run with the program. Training for ICT integration or research on what is best or innovative is still minimal (DEST, 2003).

Mishra et al (2002) stated that in order to encourage staff to use online learning we must, 'find ways to develop the expertise needed in the online world, while meeting several very real constraints such as limited faculty time, limited college budgets, fear of technology etc' (Mishra et al, 2002, p.10). Many lecturers argue that the training available to them does not meet their needs, so it is important that training programs are tailored to meet the needs of the lecturers (DEST, 2003).

Studies carried out in the area of faculty development reported that attitudinal issues such as how people perceive and react to technology stop them from changing their ways, so training is one way of assisting lecturers to see the different technological methods that could support their work. Table 2.5 summarises some of the staff development programs that have been reported.

Author	Staff Development and support	Impact on Participants	Recommendations
Crawford	• Step 1. Basic ICT	• Resistance to use ICT	• Set datelines and

Author	Staff Development and support	Impact on Participants	Recommendations
(2002)	<ul style="list-style-type: none"> workshop for all academics • Step 2. Option of attending novice or advance workshop. • Step 3. One-on-one meeting, face-to-face support. • Step 4. Trouble shooting, training and support. (online, tutorials, discussion was offered, contact information of SME) 	<ul style="list-style-type: none"> at the beginning. • Novices assisted each other during group training. • Individual support gave them confidence. • Well planned schedule encourages participants to work towards due dates. 	<ul style="list-style-type: none"> timetable for each stage of training. • Provide ongoing ICT support according to needs. • Run separate courses for novices. • Invite as many novices as possible to participate.
Sparrow, Harrington & Harrington (2000)	<ul style="list-style-type: none"> • 1999 – A 3 year project - assisted experienced academic staff develop masters programs. • Conversion of print material to online. • Information, discussion, resources, support made available to academics on the website. • Academics choose software program to use, (WebCT, Top Class etc) and had ownership of their courses. 	<ul style="list-style-type: none"> • Easy access to courses materials. • Improvement in variety & quality of resources. • Smooth flow of communication • Both students & academics gained the skills to use ICT. 	<ul style="list-style-type: none"> • Assign an ICT expert to provide ongoing support. • Allow lecturers to explore different styles of designs & presentations. • Spend more time with novices.
Westthorp & Berk (2000)	<ul style="list-style-type: none"> • Two academics (novice in designing online), one developed a student website, the other the staff website. • Receiving & understand brief from management. • Plan website, learn about website design, software and create website (storyboarding) • Learn roles for each individual. • Both academics discussed ideas together. • Design was reviewed by peers, selected academics who would use the site. • Developers were supported with specific issues. 	<ul style="list-style-type: none"> • Good rapport between designers & management. • Lecturers were challenged mentally for multiple re-workings of the content & structure. • Communicate openly with ICT experts. • Allocated time to learn software programs and ICT skills. • Set own dateline as a motivating factor. 	<ul style="list-style-type: none"> • Encourage & support lecturers interested in using ICT. • Management, ICT experts & IDs clarify expectations & design procedures. • ICT experts introduce each stage of design at a time. • Management allocated a budget for ICT & lecturers must be informed. • Provide online assistance to meet individual needs.
Martin, Hupert, Gonzole & Admon (2003)	<ul style="list-style-type: none"> • RETA (Regional Educational Technology Assistance). • Teachers experienced in using ICT in learning become trainers for novices. • Weekend workshops provided in-service training. • Established peer network, 	<ul style="list-style-type: none"> • Teachers adopted new pedagogy, became facilitators. • Lecturers presented ideas in conferences. • Use various types of hardware & software. • Involved students in ICT activities more than ever before. • Lack of Internet 	<ul style="list-style-type: none"> • Depend on circumstances only involve interested lecturers. • Different trainers must present same design ideas when dealing with novices in different groups. • ICT experts have access to ICT

Author	Staff Development and support	Impact on Participants	Recommendations
	set up to share, collaborative skills, discuss ideas & problems and challenges in pedagogical activities. <ul style="list-style-type: none"> • On-going support was in place. 	access & functioning. computers at workshop sites. <ul style="list-style-type: none"> • Lack of Web-filtering software. 	equipment and Internet facilities at all times. <ul style="list-style-type: none"> • Schedule group discussion so lecturers can share ideas and receive assistance.

Table 2.5. Staff development programs

The staff development programs listed in Table 2.5, above vary in their training aims, methods and timeframe. Phelps, Ledgerwood and Barlett (2000, p.203) stated that,

‘...online development presents significant challenges in terms of cultural change and staff development. E-Learning should be viewed as a product, there is no beginning or end to the process of e-Learning development and the pedagogy and technical goals posts are continually shifting.’

Universities have reacted differently to these challenges; some have responded by creating support units to embrace the online opportunities, as discussed earlier in this chapter. Some institutions established ICT support units in response to the demands of the academics, while in other institutions, which are yet to create their policy, e-Learning design is driven by individuals. Studies have also shown that some universities are confronted by the challenges of bringing large groups of units online. This method requires a re-structure in the whole faculty or institution (Collis, 1996). Tripp (1994) suggested that despite the different development programs that are created, academics must be supported at all stages. This will assist them to gain the technical skills and knowledge needed to develop their own e-Learning courses and to maintain and update it.

Using e-Learning requires more than the development of technical skills alone, ‘...it requires new pedagogical approaches, new working partnerships, new needs for motivation, new staffing roles and structures and new models of student support’ (Phelps, Ledgerwood & Barlett, 2000, p.204). These are the challenges that should be taken into account when designing staff development programs.

Challenges in the development program

Staff development and training programs do have their own challenges that affect team members. The first skill that team leaders must have is to create an environment that will foster relationships between members. McMurray and Dunlop (1999) claimed from their study that there was significant evidence of effective collaboration amongst team members, right at the early stage of the development process, when members realised that the success of the project was subject to individual contribution. They further commented that the workshops held at the beginning of the design process, opened up great opportunities for academics to learn together, share their resources, ideas, frustrations, teaching methods and as well as gaining the courage to comfortably, make suggestions or comments on their colleagues' design ideas. Barnett (2003) claimed that:

Technology professional development programs are successful when they focus on the teacher's stage of use. A teacher afraid of technology or a beginner user would be lost in a class for power users (Barnett, 2003, p.1).

Lecturers, especially novices in using technology (ICT), have to be convinced that ICT is worth using and staff development programs will assist them to improve their skills. Barnett (2003) listed some of the challenges that could affect a staff development program and turn it into a total failure. The challenges are:

- Decision of integrating ICT in learning is from top down by force.
- Training programs offer little hands-on experience.
- Inadequate support after the program; no follow up.
- Lecturers are not involved in the planning stage.
- Lecturers have no time to practise the skills.

Training and supporting lecturers to use ICT in the learning environment can be a challenging process because lecturers would only be committed in attempting to use ICT if they see the need and purpose of it in their work (Weaver, 2003).

Keeping lecturers interested in using ICT requires IDs and technical specialists to plan appropriate training program that would suit the lecturers' needs (Barnett, 2003). Successful design teams consist of members who are committed to their roles as they collaborate with others in the team. Lecturers should be involved as much as possible in the design process because this will help them see the potential of ICT.

Lecturers cannot be left behind; they need training on how to use ICT. New technology is entering the market today at a rapid rate and it is quite difficult for academics to keep up with it on their own. That is why ID and other computer experts are needed to guide, train and run professional development courses.

Administrative support for academics

ICT has added a new dimension to the administrator's role, which requires them to focus on IT plans, budget and implementation of ICT in their institutions. This step would be harder to handle in a developing country, as indicated by Mentz and Mentz (2002).

2.9 Team collaboration process

Teams, according to Dyer (1987) '...are collections of people who must rely on group collaboration if each member is to experience the optimum of success and goal achievement' (Dyer, 1987, p.4). In order for a team to be successful, members have to carry out their individual roles while they are being supported and assisted as they collaborate in achieving the goals of the team. Johnson and Johnson (1997, p.507) describe a team as a:

set of interpersonal interactions structured to achieve established goals ... a team consists of two or more individuals who (1) are aware of their positive interdependence as they strive to achieve mutual goals, (2) interact while they do so, (3) are aware of who is and is not a member of the team, (4) have specific roles or functions to perform, and (5) have a limited life-span of membership.

Teams of people collaborating together are everywhere. All teams have a manager, leader, or director who in most cases has the job of assessing the quality of work and is capable of giving a '...clear detailed accounting for the team's success or failure' (Dyer, 1987, p.3). Katzenbach and Smith (1993) explained that a team's performance includes teamwork products that require the joint efforts of different members of the team. Johnson and Johnson (1997) mentioned that members in a team try their best to work together, share information and do their best to produce high quality work because they know that their joint efforts and contributions will be accountable in terms of the final product.

Kaye (1997) noted that best performing teams have the following characteristics, shown in Table 2.6.

Team characteristics (Kaye, 1997)	Authors
Collaboration – work to achieve a common purpose.	Quick, 1992, Dyer, 1987, Johnson & Johnson, 1997, Procter & Mueller, 2000.
High level of communication, trust and openness.	Quick, 1992, Dyer, 1987, Johnson & Johnson, 1997, Procter & Mueller, 2000.
Resources and constant support is given to members who need it.	Quick, 1992, Myers, 1996, Procter & Mueller, 2000
Team members are committed and have high expectations.	Quick, 1992, Dyer, 1987 & Myer, 1996.
Self-esteem of individuals can be powerfully boosted through successful team work.	Quick, 1992, Dyer, 1987, & Myer, 1996.
Leadership is shared because experts/specialists are allowed to lead in their area of the team.	Quick, 1992, Dyer, 1987, Myer, 1996, Procter & Mueller, 2000.
No competition, members cooperate and respect each other.	Quick, 1992, Johnson & Johnson, 1997, Myers, 2000.
Quality – quality and accuracy in team work.	Quick, 1992, Myer, 2000.

Table 2.6. Team characteristics

The characteristics outlined above indicate that team members have one thing in common, which is to accomplish the goals of the team. Quick (1992) asserted that members of successful teams ‘...support one another, collaborate freely, and communicate openly and clearly with one another’ (Quick, 1992, p.3). The positive effect of team collaboration gives an employee job satisfaction and a high level of commitment and loyalty to their work. The negative effects of team collaboration are that members feel the pressure to perform, that they have to remove traditional skill boundaries and take on new ideas and learn new skills, that the goals may be unrealistic and may demand more time to learn new ways of doing things (Procter & Mueller, 1998).

Developing a good collaborative team does take up a lot of time because members have to be trained and they have to adjust into new ways of doing things. Kaye (1997) stated that, ‘you simply can’t expect people to change from servant to master without a period of adjustment or without some assistance from experienced and understanding professionals’ (Kaye, 1997, p.85). There has to be a lot of open communication between team leaders and members, so each must understand the goals and know the role they have to play.

Not all teamwork is successful and the reasons according to Procter and Mueller (1998) are because of inadequate and low leadership commitment *and* ‘...a failure to provide sufficient training to team members’ (Procter & Mueller, 1998, p.85).

In cases where team collaboration has failed, Procter and Mueller (1998) described the team members' relationship as a disaster. They believe that members fail to see the importance of their roles and as a result their relationship with others deteriorates and communication breaks down.

A team is made up of diversity perhaps in nationality, gender, culture and work experience, and these can be a problem. However, Myers (1996) stated that, 'team members will find that when they begin to understand diversity and learn skills to deal with it, there will be a significant payoff' (Myers, 1996, p.2). Dyer (1987, p.26) described the value of collaboration as a 'cross-fertilization of ideas and experiences...a sense of cohesiveness which was extremely supportive as development progressed.' Having a cohesive working team help members to support and assist each other to achieve the goals of the group.

Much of the team's work is accomplished during meetings, therefore it is important that the meetings are planned and conducted in an effective and efficient way. Quick (1992, p.79) stated that:

...a meeting should begin with a clear statement of the problem, issue or objective and discussion begins only when it is clear that every participant understands the meeting's purpose and what it is to accomplish.

Positive effects of group meetings are that people get involved in the discussion, ask questions and critically analyses problems and try to find solutions. The negative effects of group meetings are evident when members begin arriving late, leaving early or interrupting the meeting to attend to other business; sometimes people will end up shouting to get attention, members express disagreements and cannot compromise on suggested ideas, while some members tend to bring their personal and hidden agendas into meetings. Such negative behaviours will destroy the working relationship amongst workers in the team.

Johnson and Johnson (1997) pointed out that, 'teams structured cooperatively will be more productive than teams structured competitively or individually... the more cooperative the team the greater the productivity and the more committed team members are to each other' (Johnson & Johnson, 1997, p.518). Dyer (1987) conversely argues that an effective and cooperative team is not always easy to establish, and often teams who begin as cooperative teams fail simply because

members are not motivated and if they see no justifiable reasons to pursue the goals of the team then relationships crumble and fall apart. Katzenbach and Smith (1993) suggested that teams fail because leaders are not effective. Therefore, it is important that teams must be structured and nurtured, to achieve their goals. Most of the ideas discussed above apply to teams in organizations, industries and manufacturing plants. These concepts do however, fit in well with teams formed in the education environment. The next section will cover how teams perform when lecturers and IDs collaborate and work together as a team in the e-Learning environment.

Team Collaboration in designing an e-Learning environment

Collaboration has been defined in a variety of ways in education, most often in ways that describe situations where people work together to promote change (Price & Schlag, 2002, p.6).

Team collaboration in the design of learning environment is very important because individuals are experts in their own field and their skills are needed in the design process. Baskin (2001) explained that collaboration brings different individuals to put their best efforts to achieve a certain goal:

Groups accomplish tasks that cannot be done by individuals alone; they bring multiple perspectives to bear on a single problem; they capture the dynamic of real world complexity; they provide a vehicle for decision making and taking; and they impose an efficient means of organization control over individual behaviours (Baskin, 2001, p.265).

A study by Keppell (1997) shows that there are times when the ID may not be able to proceed without input from the lecturer, especially if the subject content is unfamiliar to the ID, and this is when the ID needs assistance from the lecturer or the subject-matter expert. In other cases, the ID may be familiar with the subject content but would still require the lecturer to outline the activities and actually participate in the design process, so they can benefit as they learn (Hron & Friedrich, 2003).

Online learning is changing the teaching and learning environment in higher education institutions and as a result lecturers are experiencing increased pressure to use ICT to create more challenging learning activities (Gray & McNaught,

2001). Learning in different disciplines is becoming more complicated especially when lecturers think of putting together more authentic activities (Resnick, 1987; Jonassen, 1991; Luca & Oliver, 2002; Herrington, Herrington & Omari, 2002; Keppell, 2002) in an online learning environment. This is when they would require specialised ICT support from IDs and other technical experts. McNaught, Phillips, Rossiter and Winn (2000), listed six key issues that emerged from a staff development program where staff from different disciplines and departments collaborated together to improve the quality of learning. Three of those points that applies to this study are:

- There has to be a strong relationship between staff members and the production support services.
- Careful planning should be agreed upon by lecturers and the support services (ICT staff) to ensure that there is enough time to learn new skills and practise them.
- Professional development support must be flexible, appropriate and adaptable. This should be agreed upon by the staff members and the support services.

The collaboration process in designing e-Learning environments is not always easy. It does take a lot of effort to plan and run staff development that will meet the needs of lecturers and help IDs to see how best to improve their courses and this can be frightening for some staff (Alexander & Mckenzie, 1998). It has been realised from failed staff programs that IDs need to encourage lecturers to reflect on and make decisions about their own ICT development needs on an ongoing basis. This will give lecturers more involvement and ownership and greater integration of ICT within the teaching and learning process (Thompson & Rodriguez, 2003).

2.10 Future trends

Collaboration in designing online learning has created networks between lecturers and IDs in different universities (Keppell et al., 2001; Weaver, 2003). Technological experts and lecturers involved in designing e-Learning environments are sharing their experiences while finding solutions to the problems they encounter, and to improve their e-learning resources. Universities today are creating staff development programs that introduce staff to ways of

improving their pedagogy in online teaching (Weaver, 2003) and professional development programs and support units are priorities of most universities today (Knowles, Kunz & Tarnowska, 2003). Mishra et al (2000) claim that some universities that have created ICT support units have discovered that they still have not managed to convince and train all lecturers within their institution to use ICT in their teaching. Most ICT staff development programs have failed to encourage lecturers/teachers to take full advantage of the benefit of e-Learning. In supporting this Murphy (2000, p.84) reported that in some universities, staff development programs 'which began by including every individual teacher in their training program have discovered that this is not possible so they reviewed and changed their plans to only help those interested in using ICT'. Such a result emphasises that staff training and development opportunities have to be flexible so appropriate support can be given to individual lecturers that are ready and willing to use ICT. Giving lecturers the choice allows them to weigh everything up before committing their time to learning new skills.

However, the realisation of this ultimate goal of training lecturers to use ICT is not beyond reach. IDs, technical experts and trainers are reviewing and evaluating their staff development programs with an aim to improving the training plans so they will be able to provide continuous support to lecturers.

2.11 Literature relating to PNG situation

Vaa (2002) outlined in her report that 'ICT development is *ad hoc* and there needs to be a blueprint for ICT development so that change is uniform and not staggered. In PNG we do not really have an ICT infrastructure, and PNG needs as much help as possible. The report listed a number of constraints on the use of ICT in PNG such as: (a) high cost of equipment, (b) High cost of telecommunications, (c) unreliable power supply and poor quality of Internet services, (d) poor telephone networks and (e) Lack of skilled support services. This reported also discussed the high rate of high school dropouts and the need to improve the distance learning centres using ICT, so young people who cannot afford to attend school can gain an education through ICT. Media such as the radio and television are well used for educational purpose for the whole country but warned that adequate staffing resources must be put in place. Shaw (2002) expressed that the Education Department in PNG supports the use of ICT in

education so AUSAID responded by funding 5 multimedia centres in 5 teachers training colleges to enable students and lecturers to use ICT in the learning environment. Training for lecturers to use these resources is still a great need. Evans and Ninol (2003) expressed that most universities, government and private offices are using ICT. They also pointed out that ‘many local development organizations have at least one computer. Most have not had the guidance and support to use this resource in a creative or exploratory mode. The non government organization (NGO) are ‘committed in enabling local development workers and organizations...to learn, demystify and take advantage of the great leaps forward in ICT for different aspects of their work,’ (Evans & Ninol, 2003, p.5). Many NGO groups, the government, universities, secondary schools and some private primary school have the ICT resources but training is required for users to benefit from it. Stock and Leeming (2004) reported that the:

‘government has already taken the lead on ICT development and will set up a committee to lead the development of the new national ICT policy and strategy...consists of members of all society including civil society, private society, academia...funds for ICT development will need to be allocated from the government budget.’ <http://portal.unesco.org/education.htm>

Further, the government has set up committees to conduct research into different issues on how ICT can be implemented in the country. The reports into indicate that PNG has recognised that ICT has to be used for business and education. Pacific Adventist University has the resources to use ICT in the learning environment but we have to have a training package in place for our lecturers and staff to enable them to use ICT resources effectively to benefit the learners.

2.12 Specific studies related to the current study

Instructional Designers, according to King et al., (2000), are needed in every higher educational institution implementing technology to support and enhance learning. From their experience in California Academic College, they suggested that an ID should be a person who has some basic knowledge about different types of software programs to enable him or her to direct and assist lecturers to develop their e-Learning environment. From their point of view, an ID should

not only support lecturers in the learning of new skills and the use of new methods of teaching, but should also suggest better ways of improving learning experiences, because they know the most appropriate technological tool to use for the desired activity. King et al., (2000) emphasized that having a good rapport between the ID and lecturers is the only way to achieve successful results.

Another study by White (2000) reports a successful development of a distance online course by a design team, which used a collaborative team approach to develop their online course. The team comprised an instructor, Internet specialist and an instructional designer. The conversion of the courses from conventional method to online courses required a greater effort, co-operation and collaboration on each individual's part. Each member had to examine, discuss and agree on the technical and pedagogical options before each section of the course was developed. The downside of this project was that there was not enough time for discussion because of the lecturers' busy schedule. Despite the downside reported, every team member agreed that the online course they developed was a success, because everyone was satisfied with their contribution. Constant collaboration was the underlying point of success for the group.

2.13 Contribution of this study to the literature

The findings of this study on effective collaboration strategies will add to the growing body of literature on lecturers and IDs working together in the design process. Although lecturers/educators are considered as change agents and are expected to develop competencies in using ICT in the learning environment, they face a great challenge in changing their instructional practices. They need ongoing support and guidance from ICT experts and IDs to help them understand new teaching and learning paradigms while learning the ICT skills to assist them use technology. Lecturers and IDs in this study work as a team throughout the planning and design process with an aim to create effective and quality e-Learning environments. Studying such a collaborative design process should provide strategies that may facilitate change to assist teams of IDs and lecturers use ICT in their work.

2.14 Summary

This chapter discussed the role of ICT in the learning environment. It began by comprehensively describing the benefits of ICT and how it supports learning in the e-Learning environment. The literature now has a wealth of research into staff development training programs put in place to support lecturers and staff of each institution. Education departments, higher educational institutions, individual IDs and lecturers are doing their best to ensure that there is quality in the e-Learning environments they design.

Emphasis is also placed on universities to adopt new technologies and have policies that will guide IDs and lecturers to make use of e-Learning opportunities in moving from a traditional teacher-centred instructivist approach to a more learner-centred constructivist approach. With these concepts, comes the idea of authentic learning that is being embraced by most e-Learning designers and users today. There are barriers faced by lecturers in the design process as they take on the challenge of using the new paradigms of teaching and learning in using ICT.

E-Learning environments, subjects and practices are continually being tested, upgraded and improved to reach a satisfactory level that is assessed by the designer, lecturer and students. Although there is a great push for lecturers and academics to use ICT, there are still some that are yet to make a change in their teaching practice and get involved in using ICT for teaching and learning purposes. According to recorded studies in the literature the only way to assist lecturers/educators is for IDs to carefully plan and work with individuals to help them see the values and benefits of ICT before committing their time to learning the skills of integrating ICT in the learning environment.

The next chapter describes the methodology adopted in this study to explore the team collaboration process employed by the lecturers and IDs as they carried out their assigned roles in designing their individual e-Learning environments.

CHAPTER THREE
METHODOLOGY
Gaining knowledge of the team collaboration process

3.1 Introduction

This chapter sets out to examine the team collaboration process that occurred between participants of two teams as they collaborated together to plan and design e-Learning environments for subjects delivered at the tertiary level, one team consisted of an ID and three lecturers and the other had one ID and a lecturer. The study focused on the following goals.

- To examine the strategies in teamwork, communication, meeting and design employed by the lecturers and IDs as they work together as a team to develop online learning environments.
- To describe the participants' (lecturers and IDs) views of the role of information communication technology (ICT) as a learning tool.
- To describe the concerns and issues experienced by both groups (lecturers and IDs) engaged in the study.

3.2 Research design

Selecting a research method to use in any study depends upon the purpose of the study as well as the 'nature of the research problem', (Strauss & Corbin, 1998, p.10). Researchers employ the methodology which will provide a sense of vision and which has the techniques and procedures that 'will furnish the means for bringing that vision into reality through its data gathering and analysis methods' (Strauss & Corbin, 1998, p.8).

From the literature review (p.18), and the purpose statement (p.9) it was apparent that a qualitative methodology was the appropriate approach to use, because the research was conducted in a natural setting where the participants collaborated as teams. Hence, the study was a naturalistic inquiry (Lincoln & Guba, 1985). 'Qualitative research methods are another way of understanding people and their behaviour...' and this is specifically what this study set out to explore (Burns, 1997, p.294). Qualitative researchers are concerned with making sure they capture perspectives and information accurately so they use a variety of methods to gather detailed information that will give them a holistic view of the study

from the participants' point of view as well as other sources, (Bogdan & Biklen, 1992). The researcher in this study intended to discover what the participants were experiencing, how they interpreted their experiences, and how they acquired the best solutions to problems associated with the design process.

The method of inquiry was that of case study, because the focus of the study was to report an in-depth investigation and analysis of two projects (the case studies), and its purpose was to describe the techniques and qualities of team collaboration and staff professional learning.

Bogdan and Biklen (1982) stated that, 'a case study is a detailed examination of one setting, or one single subject, or one single depository of documents or one particular event' (Bogdan & Biklen, 1982, p.58). In addition to this, Cohen and Manion (1994, p.106) point out that:

... the case study researcher typically observes the characteristics of an individual unit
...the purpose in such observation is to probe deeply and to analyse intensively the multifarious phenomena that constitute the life cycle of the unit with a view to establishing generalisations about the wider population to which that unit belongs.

The case study approach has been defined as '...an empirical inquiry that investigates a contemporary phenomenon within its real-life context...' (Yin, 1994, p.13), as is this study. Creswell (1994, p.6) states that 'a case study is an exploration of a bounded system...the context of the case involves situating the case within its setting, which may be a physical setting...' or, as Miles and Huberman (1984, p.28), states it is '...a bounded context in which one is studying events, processes and outcomes.' This study was based in a natural setting rather than an artificial one, and the aim was to obtain information from participants of two teams. A case study approach emphasises situational analysis and it focuses on understanding the specific context of the case investigated. It also has the advantage of making a multi-dimensional exploration of the same unit, and developing the breadth and depth of a research situation (Creswell, 1995). The case study approach is about particularisation and uniqueness not generalization. This emphasises that the case under investigation is different from others and the '...emphasis is on understanding the case itself...' (Stake 1995, p.8).

For this research study, the case study approach adopted was seen to be the most suitable. It enabled the researcher to see the '... episodes of nuance, the

sequentiality of happenings in context ... and the wholeness of the individual...’ involved in the project under study (Stake, 1995, xii).

Such studies are designed to consider wholes rather than parts and ‘...they make use of a wide variety of data collection methods as long as it is practical and ethical,’ (de Vaus 2001, p.231). Bogdan and Biklen (1982) stated that qualitative study, especially a case study is best described as a ‘funnel,’ since it begins at the wider end of the phenomena by finding a suitable location and participants, then proceeds into data collection, which then narrows down to more appropriate concepts and ideas relevant to the study through the process of data analysis and interpretation of data. They also suggest that the study has to be of sufficient interest to the researcher to assist him/her focus on detailed information that occurs within the study.

Case studies in context

This enquiry consists of two case studies. Case one was the development of a suite of information communication technology (ICT)-supported subjects for a postgraduate course; the participants were three lecturers and one ID. Case two focused on the dependability of a website design to support a graduate diploma course; the participants were one lecturer and one ID. Both tasks were not specifically designed as special projects for the purpose of the research; they were carried out according to the plans of the university to utilise ICT to enhance learning at tertiary level. The research was conducted in an environment where participants in each team collaborated together in the planning the design process before actually designing their subject websites.

As stated earlier, the theoretical methodology that underpins this study is the qualitative methodology since there are neither constraints nor precise structures to test the objectives of the study as in a quantitative research. A qualitative method uses different paradigms to acquire data. A paradigm according to Bogdan and Biklen (1982, p.30), is defined as a

...loose collection of logically held-together assumptions, concepts, or propositions that orient thinking and research. When we refer to a theoretical orientation...we are talking about a way of looking at the world, the assumptions people have about what is important, and what makes the world work.

There are different theoretical underpinnings in qualitative research and also many debates concerning the use of different theories in such research. Many have tried to define qualitative research in its simplest form and, as such, Tuckman (1988, p.367) identified ten features of qualitative research that support this study as follows: naturalistic inquiry, inductive analysis, holistic perspective, qualitative data, personal contact and insight, dynamic systems, unique case orientation, context sensitivity, empathic neutrality and design flexibility. These themes will be elaborated on in different sections of Table 3.1.

Inquiry Employed	Supportive quotes from literature.	Rationale for using it within this study.
Qualitative Research	<p><i>Characteristics of qualitative research</i>, ‘the natural setting is the data source and the researcher is the key data-collection instrument’.</p> <p>‘it attempts primarily to describe and only secondarily to analyse’.</p> <p>‘its data are analysed inductively’.</p> <p>‘meaning is of essential concern’ in the process. (Bogdan & Biklen, 1982, p.27).</p> <p>‘...Qualitative approach includes the need to set boundaries and find a focus to ensure that the process is credible, appropriate, consistent, confirmable and neutral’. (Guba and Lincoln (1981)</p>	<p>Both projects (case studies) were carried out in their natural settings, not on an artificial basis.</p> <p>Data collection will be done by the researcher and the case has set boundaries.</p>
Naturalistic inquiry	<p>A ‘qualitative researcher studies things in their natural settings, attempting to understand the meaning or nature of experience of persons’. (Denzin & Lincoln, 1998, p.6).</p>	
The strategy	<p>‘A team is a set of interactions structured to achieve established goals...a team consists of two or more individuals who (a) are aware of their positive interdependence as they strive to achieve mutual goals, (b) interact while they do so...(c) have specific roles or functions to perform’ (Johnson & Johnson, 1997, p.507).</p> <p>‘People in teams have not been brought together merely to engage in social relationships: they are there to perform a body of work. This will have a bearing on the sort of roles they take up. Work roles may be defined as the mix of tasks and responsibilities undertaken by individuals or executed within teams. Team roles signify the contributions that individuals are typically disposed to make in their working relationships’. (Belbin, 2000).</p>	<p>Lecturers and IDs collaborated as a team to design online learning environments.</p> <p>Same as above</p>
Data Collection and Analysis techniques.	<p>Strauss and Corbin (1995) described qualitative methodology as any type of research that produces findings that are interpreted from a naturalistic perspective and not from using any forms of statistics.</p> <p>‘socially constructed nature of reality, the intimate relationship between the researcher and what is studied... they seek answers to questions that stress how social experience is created and given meaning,’ (Denzin and Lincoln, 1998, p.8).</p> <p>‘Case study approach is a detailed examination of one setting ... or one particular event.’ (Bogdan and Biklen, 1982, pg.58).</p> <p>‘The real business of case study is particularisation, not generalisation...take a particular case and come to know it well, not...how it is different from others, but what it is, what it does...emphasis on uniqueness and that implies the knowledge of</p>	<p>Case study (two case studies).</p> <p>The researcher followed both cases from the initial stage till the end of the project.</p> <p>The study was a detailed examination of the collaboration between lecturer</p>

Inquiry Employed	Supportive quotes from literature.	Rationale for using it within this study.
	<p>others that the case is different... the first emphasis is on understanding the case itself.' (Stake, 1995, p.8).</p> <p>A case study is most useful in achieving the ultimate purpose of reporting; raising the understanding and maintaining the continuity. (Lincoln and Guba, 1985, pp.357-360).</p>	<p>and IDs.</p> <p>A unique situation where the researcher tried to report and understand the collaboration process.</p>
<p><i>Data Collection</i></p> <p><i>Data Analysis</i></p>	<p>Qualitative research deploys a wide range of interconnected methods, hoping always to get a better fix on the subject matter at hand. It stresses and emphasizes 'socially constructed nature of reality, the intimate relationship between the researcher and what is studied... they seek answers to questions that stress how social experience is created and given meaning,' (Denzin and Lincoln, 1998, p.8).</p> <p>Case studies employ multiple methods of data collection and data analysis (de Vaus, 2001). Data collection methods are participation in the setting, direction observation, in-depth interviewing and document review (Marshall and Rossman, 1995).</p> <p>'is a process of bringing order, structure, and meaning to the mass of collected data,' (Marshall and Rossman, 1995, p.111) and they further outlined the analytic procedures, 'organizing data, generating categories, themes, and patterns... searching for alternative explanations of the data and writing the reports', (p.113).</p> <p>'inductive analysis or through a process of making sense of the field data.' (Lincoln & Guba, 1995, p.40).</p> <p>'Constant comparative method of data analysis was employed.' (Strauss, 1987).</p>	<p>Data Collection: Semi-structured interview, Participant observation, Artefacts –(initial planning flow charts, course outlines), Researcher's journal.</p> <p>Data Analysis: Data were coded into categories and themes. Verification by participants.</p>

Table 3.1. Theoretical framework

3.3 The Study

Case studies

The two case studies were not specifically designed for this study, as stated earlier (p.61). However, the reasons for selecting them are as follows:

The objectives of both case studies matched the researcher's interest in investigating the team collaboration process that occurred between lecturers and IDs when designing ICT- supported learning environments. The commencement of both projects fell within this study's timeframe (2 months), so the researcher embraced this opportunity to carry out the study.

Participants

Participants in the study were purposely selected because the nature and aim of both projects would enable the researcher to obtain specific and relevant information. The selection process can be described as purposive or opportunity sampling as participants were not randomly selected (Bodgan & Biklen, 1982).

The lecturers, who participated in the study, were specialists in their own subject areas, while the two instructional designers were highly qualified in the field of Information and Communication Technology (ICT) which included online learning environments. Both IDs have had many years of experience in designing online learning environments for different levels of education.

The structures of the case study group

Case study one consisted of three lecturers and an ID. Lecturers in this group were expected to plan, arrange and design their own subject resources while the ID was there to provide appropriate technical advice and support as required by each individual lecturer. Case study two had one lecturer working with an ID. The lecturer and ID were expected to share ideas and assist each other during the design process.

Gaining access and ethical considerations

Before this study was conducted, every effort was made to follow the guidelines (<http://www.uow.edu.au/research/staff/ethics.html#Human>) set by the University of Wollongong for obtaining permission to engage the participants in this study. Permission was granted by the Human and Ethics committee of the University of Wollongong, enabling the study to be conducted (Ethics committee approval no: HE 02/402, Appendix. 206). Participants (lecturers and IDs) gave their consent with the understanding that they were free to withdraw at any time during the study if they so wished and the data concerning them would be withdrawn and destroyed.

Confidentiality

This was guaranteed to participants and they were made aware that the data collected would be used solely for the purpose of this study.

3.4 Data collection and analysis process

Data collection process

Multiple sources of data gathering were employed at different stages of the study. Qualitative methods were mainly employed for data collection since they exposed the nature of transactions in the process more directly and were easy to adapt in

dealing with the multiple realities of the situation (Lincoln & Guba, 1985). Burns (1997, p.374) outlined three principles of case study data collection, use of multiple sources, maintaining chain of evidence, recording of data, and these were adopted in this study.

1. Use of multiple sources:

The use of multiple sources is the major strength of the case study approach. Multiple sources allow for triangulation through converging lines of inquiry, improving the reliability and validity of the data and findings. Corroboration makes a case study report more convincing, (Lincoln & Guba, 1985, p.315). This study used multiple sources to gather data.

2. Maintaining chain of evidence:

Verification should be easily traced whether from the initial research questions to the conclusion or from the conclusion back to the initial research questions (Lincoln & Guba, 1985). The evidence should be cited in interviews, documents and from specific observations. (Chapter 4 will show the chain of evidence from the data).

3. Recording data:

On-site recording can range from sketchy notes to detailed notes using a notebook or on video or tape. During the course of this study, the researcher sat among the participants during their group meetings and made sketchy notes while observing their meetings and listening to their conversations. Only the two final meetings in both groups were audio taped, and that helped to provide additional information to the sketchy notes. At the end of each meeting the researcher collated full notes and descriptions from the sketchy notes that provided a full record of vital facts and events that were important to the study. Other summary notes made from observing the websites, and from informal conversations conducted with participants in the study were included. Full notes were also made from these summaries and provided additional information for the study.

The main sources of data collection included in-depth dialogue with all participants (lecturers and IDs) from both teams, group meeting reports, individual reflective reports, artefacts such as the subject outline, and flow charts and diagrams which represented the subject website plans for lecturers and IDs.

The secondary data sources in the study are the researcher's journal, and observation and discussion notes. The data collection strategies will be described in detail later in the chapter.

Data analysis process

The purpose of analysing the data was to seek interpretation of the data by looking for meaning, then arranging and presenting the information in a systematic way. This is done by comparing, contrasting and gaining different insights from the data (Burns, 1997). The analysis process in this study occurred at different stages at the completion of each set of data. Marshall and Rossman (1995, p.111) supposed that:

‘... data analysis is the process of bringing order, structure and meaning to the mass of collected data. It is a messy, ambiguous, time-consuming, creative, and fascinating process. It does not proceed in a linear fashion; it is not neat.’

The analysis process commenced after preliminary interviews with the participants (IDs and lecturers) were conducted. All interviews in this study were audio-taped and transcribed immediately after conducting each of them. The researcher then read through each transcription several times before coding and categorising the emerging key concepts, issues and themes, in using the open coding technique (Strauss & Corbin, 1998) where key concepts are identified and labelled. In support of this process, Burns (1997) stated that ‘...the first stage in analysing the interview data is coding, i.e. classifying material into themes, issues, topics, concepts, propositions’ (Burns, 1997, p.339). In addition Miles and Huberman (1984) emphasised that ‘...coding is not something one does to get data ready for analysis, but something that drives ongoing data collection. It is, in short, a form of continuing analysis’ (Miles & Huberman, 1984, p.63), where the analysed data provided the basis as well as the direction for latter stages of data collection and analysis. Hence the inductive analysis process was adopted as a process of making sense of the field data (Lincoln & Guba, 1985). In addition, Denzin & Lincoln (1998) suggested that ‘...when a theme, hypothesis, or pattern is identified inductively, the researcher then moves into a verification mode, trying to confirm or qualify the finding. This then keys off a new inductive cycle’ Denzin & Lincoln, 1998, p.186).

All field-notes were transcribed, analysed and coded into categories and filed. ‘The purpose of coding and filing is to enable the investigator to sort and organise the obtained information into patterns and themes’ (Burns, 1997, p.338). The researcher continued to compare, link and identify similarities and differences in patterns and themes that emerged in each category, thus using the constant comparative method of analysis described by Strauss & Corbin (1998), as the study progressed. The pattern of simultaneously collecting and analysing data from one stage to the next assisted the researcher to re-shape the study and narrow it down to more focused themes. Three interview sessions were conducted with each team during the study, one at the beginning after their initial meetings, and a second during the working stage, and the final reflective interview took place at the end of the design process.

Table 3.2 below presents the sequence of the different data gathering methods employed in the study. Following that, an explanation of each stage of data gathering and data analysis is described as it occurred within the study.

Data gathering method	Participants
Preliminary interview	Four IDs (two were not involved in the study, while the other two were involved in the study). All lecturers involved in the study.
First Group meeting – Team one & Team two	Team one – three lecturers and one ID. Team two – one lecturer and one ID.
First interview	Participants in both teams were interviewed.
Informal Observation	Observe individual participant’s progress.
Informal Discussion	Lecturers and IDs.
Second Group meeting	Team one & Team two (same participants)
Second interview	All participants (lecturers and IDs).
Design period	Participants were individually consulted by the researcher to explain the design process they were engaged in. The main focus was on collaborative planning to individual design.
Final interview (reflective interview)	Participants reflected on the team collaboration work they did with the IDs.
Artefacts	Analysed artefacts collected from participants such as design plans, flow charts, meeting reports, email contacts etc.
Researcher’s journal	The researcher’s journal confirmed some of the ideas that emerged from the data.

Table 3.2. Data gathering methods

3.5 Preliminary data collection

To gain an insight into the procedures of an ID, the researcher interviewed four IDs employed at the university where the study was conducted. Out of the four IDs who were interviewed, two were involved in the study while the other two were invited to respond to the same questions as a further way of triangulating ideas emerging from the interview process. These interviews provided some

valuable insights on how IDs perceived their respective roles, their relationships with lecturers and their views on the different strategies (communication, planning etc) that they employed during the design process. To eliminate subjectivity in the data obtained from the IDs at the preliminary stage, lecturers involved in the study were also interviewed to assist the researcher to identify their views and plans before collaborating as a group. Each participant was interviewed individually and the interviews were based on the research questions of the study (p.14). The main focus of the preliminary interview was divided into three main areas as listed below.

Roles of IDs and lecturers

Each participant was expected to describe and explain her/his individual role in the design process.

Planning the design process

- Review professional strategies and processes employed during the design process.
- Describe their experience as they collaborated with lecturers or academics in the process of designing online learning environments.

Concerns and issues

Review their main concerns when working together as a team in the study.

As stated earlier, these preliminary interviews aimed at understanding the team collaboration design process from the participants' point of view, before they began working together as a team. The preliminary interviews were immediately transcribed after they were conducted and the subject interviewed verified each transcript for accuracy in interpretation. Each transcript was read through several times before emerging ideas were coded and categorised. These categories were carefully selected to suit the objectives and to set the course of the study. The main categories were also used as the basis of setting the questions for the first interview, which occurred after the first group meeting. The preliminary data were analysed using the open coding method, (Strauss & Corbin, 1998) where main concepts were identified and clustered to form categories as shown in Figure 3.1.

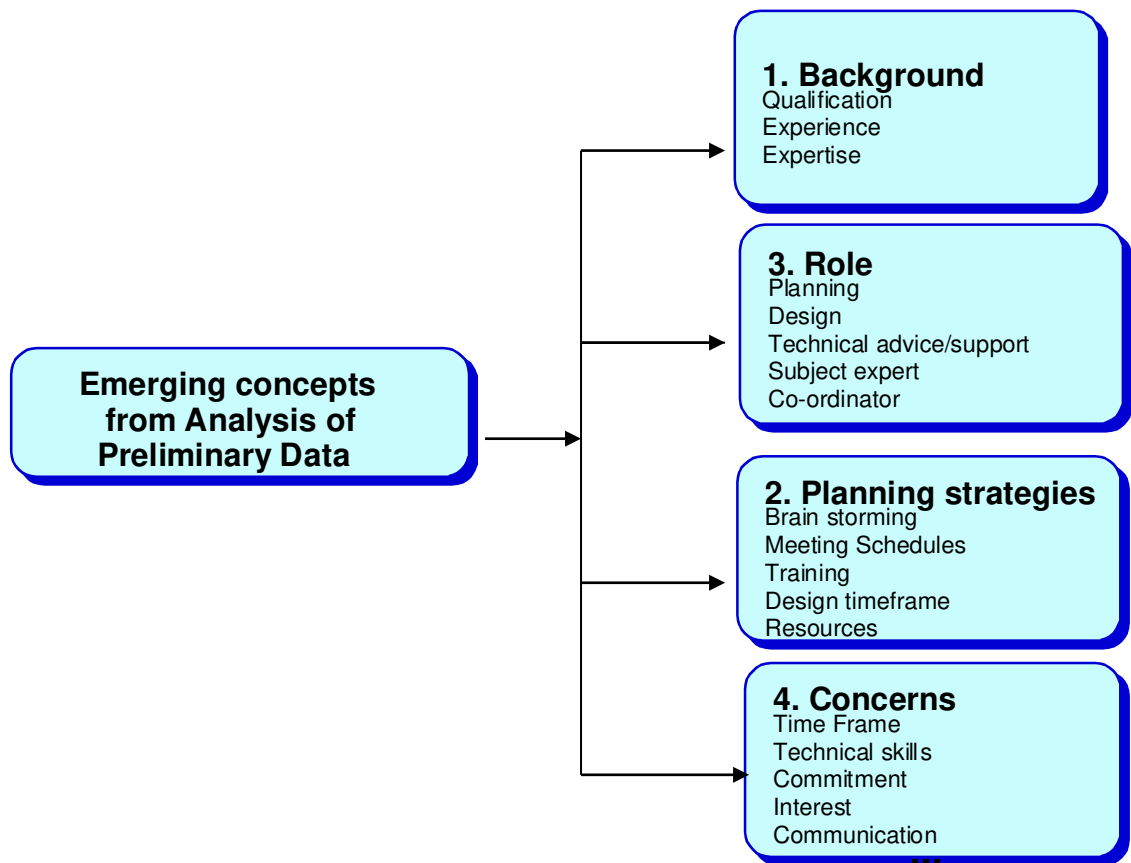


Figure 3.1 Main concepts from preliminary data.

Group meeting one

The first group meeting with the researcher was the basis of informing participants about the role each member had to play in the teams. This was a formal meeting and all members were required to be present. After this meeting individual lecturers had *ad hoc* meetings with the ID depending on the problems or concerns they were experiencing. The first meetings in both teams were very similar and Table 3.3 illustrates some of the similarities and differences of these meetings.

Attributes	Similarities	Differences
Members	Lecturers & ID	T1 - 3 lecturers & 1 ID. T2 – 1 lecture & 1 ID.
Lecturers' ICT skills	Could use the computer	T1 - Novice in online learning environments. T2 – Had technical skills, an expert.
Resources Use:	Whiteboard Website samples	T1 – ID used Power Point presentation. T1 – Handout about ICT for lecturers. T1 – ID gave lecturers a chart to plan their websites. T2 – Lecturer explained the concept and drew a diagram to

		represent ideas. T2 – both lecturer & ID had website samples.
Chairperson	Facilitator	T1 – ID facilitated the meeting. T2 – Lecturer facilitated the meeting.

Key: T1 represents team one and T2 represents team two

Table 3.3. Summary of group meetings

After the first meeting, lecturers in team one were given time to plan the content of their subjects, assessments and other resources for their individual websites. The lecturer in team two continued to discuss the features and plans of the website with the ID which resulted in alterations made to the diagram each time they met. The researcher attended and observed both teams' first group meetings and later interviewed all participants during the same week.

3.6 First interview with participants in both cases

The first interview occurred after both teams had their first group meeting, which was basically a brainstorming session. Each team took a different approach in addressing their first meeting. In team one, lecturers were novices in the online learning environment, so they mainly listened as the ID explained the role of technology in education and presented examples of subject websites designed in WebCT for other subjects and currently used within the university. The ID also explained the role each member is expected to play in the project.

The lecturers were given time at the end to express their views, but the overall meeting was facilitated by the ID. Team two had a different experience where the lecturer facilitated the meeting while the ID listened to the plan and information as intended by the lecturer. Participants were individually interviewed and audio-taped. This interview allowed them to explain and describe their new experiences, expectations, plans, roles, and how they perceived their contribution towards the design process.

Interview questions were mainly based on the themes derived from the preliminary interviews, while some of the questions were adopted from the interview questions in Keppell's (1997) study. The questions were used by IDs to understand their clients (subject matter experts or lecturers engaged in this

study) before actually planning the design process with them (Appendix Four, p.214 & Appendix Six, p. 218). These questions were relevant in this study because they assisted the researcher to understand how lecturers and IDs began collaborating as a team at the beginning of the projects.

The first semi-structured interview was conducted and audio-taped in each participant's office for 25–30 minutes. Questions ranged over their expertise and experiences, skills and knowledge in ICT and their involvement in the project. Participants were given a copy of the interview questions before the interview began to give them an opportunity to know the type of information the researcher wished to obtain. The collected data were analysed inductively as the researcher was attempting to make sense of the data (Lincoln & Guba, 1985) to represent the main ideas that would guide the next stage of data collection and analysis.

Formal and informal observation and discussion

The researcher was invited as an observer during the formal group meetings. This was an opportunity for the researcher to note the participants' contributions or reactions to certain concepts, concerns and issues, and to closely follow their design approach as it unfolded from their plans. Informal observation (outside of meetings) of the different design strategies and discussion with the participants revealed additional information about the design plans which helped to clarify each participants experience in the design process. During the informal discussion period, the researcher took the time to observe their plans, charts and diagrams and listened as they explained the reasons for selecting what they had included in these.

Group Meeting Two

Attribute	Similarities	Differences
Subject plans	Lecturers used charts/diagrams	T1- Lecturers explained their plans drawn on charts. T2 - ID explained ideas on the flow charts & lecturer continued to add new features, amend others etc.

Concerns	Copyright matters Technical issues	T1 – Copyright issues depended on librarian & ICT issues depended on the ID. T2 – ID handled the copyright issues & ICT issues.
Website design style	Website designed for adult users	T1 – Website for face-to-face & distance students. T1 – Choice of assessments deferred. T2 – Website for all lecturers teaching in the same course, no assessments required.
Timeframe	Set dateline	T1 – Timeframe drawn up for everyone, but individual organised own meeting time with ID. T1 – ID advised that she will be available at all times. T2 – ID began designing the website as planned without waiting for the lecturer and showed lecturer her work during the meeting.

Table 3.4. Similarities & differences of the second group meeting

Group meetings and discussion procedures

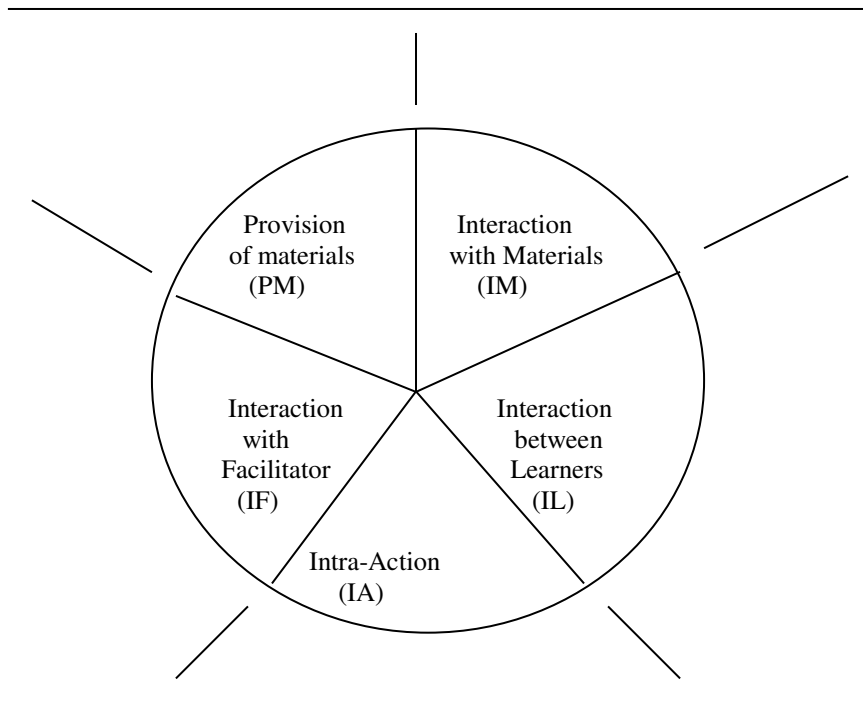
The first common activity that occurred in each case was drawing diagrams (Figure 3.3 & Figure 3.4) on the whiteboard to represent the different features that would appear on the interface of their chosen subject websites. Both group meetings were mainly focused on planning of the website structures and features; technical issues were not discussed and were avoided as much as possible during these meetings. Technical issues were only touched on when the ID knew that lecturers, especially in team one, were confident and ready to learn about it; and that occurred during the final stage of the design process. The charts and diagrams assisted the lecturers to visualise the interface of their websites and that gave them the opportunity to voice their plans and concerns to the ID, who was available to answer their queries, make suggestions or advise on their plans and ideas. Figure 3.2 shows the chart that the ID in team one adopted from Caladine's work (1999) and gave to the lecturers to use as a guide in planning their individual websites.

Teaching and Learning Overview

Lecturer:

Subject:

Consultation Date:



Issues:

Figure 3.2. Chart for planning used by lecturers in team one

The second group meeting began with lecturers in team one revealing and explaining their plans drawn on charts. The ID listened, then made suggestions and constructive comments on each individual's plan which lecturers really appreciated. Next, the ID gave more ideas to lecturers by describing the different features that would usually be used on subject websites. These features were then drawn on the whiteboard as illustrated in Figure 3.3.

As mentioned earlier, most of the lecturers in team one were novices in planning and integrating an online learning environment so the visual diagram played a very important role in assisting each individual with their planning.

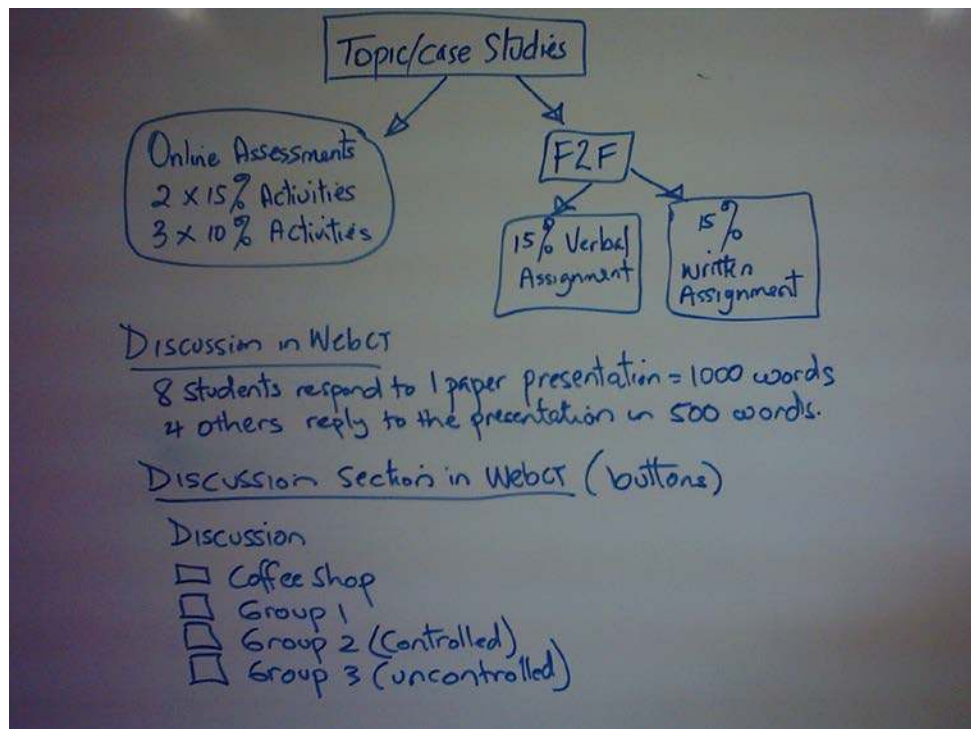


Figure 3.3 Sample diagram for team one

Figure 3.3 represents the different features and pedagogical methods that lecturers could use in their subject websites. Unlike the first meeting, the discussion period during the second meeting lasted longer because lecturers by then had attempted to plan out their individual subject websites using the chart provided by their particular ID during the first meeting. They were now in a better position to understand what to do and how to go about it. The idea of planning their own subject websites before attending the second meeting was an excellent strategy because it provided an opportunity for lecturers to uncover different methods of arranging the learning materials for the students. The second meeting took longer than anticipated because lecturers asked a lot of questions with the expectation that the ID would provide suitable answers to assist them plan their subject websites. The ID in team one seized the opportunity to highlight the different problems experienced in online learning environments but at the same time provided hints and ways of minimising such problems. The discussion mainly focused on very basic technical issues, types of assessments, fairness in assessments, copyright laws and training, compatibility of software programs and methods of arranging effective online learning resources. Towards the end of the discussion a timeframe was drawn up to assistance all the lecturers in team one to organise their work and prepare their websites for uploading resources well before the beginning of the session.

Design plan demonstrated by the lecturer in team two

Team two's approach to the design process was slightly different. Both members in team two had the technical skills and experience in online learning. The lecturer facilitated the conversation by explaining the website interface and actually drew the diagram on the whiteboard in the form of a flow chart. The ID in team two was engaged as a technical consultant and advisor throughout the process. Figure 3.4 shows the design plan that was drawn up on the whiteboard by the lecturer to illustrate the different features that will be included on the course website. The diagram looked messy on the white board but the lecturer and the ID knew exactly what each stroke of writing represented and where it would be located on the website.

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

Figure 3.4. Course Website design plan for team two

Figure 3.3 and Figure 3.4 above, illustrates the actual diagrams that visually represented the proposed WebCT interface which lecturers especially those in team one could adopt in their individual websites. The lecturer in team two drew this diagram during the meeting to illustrate the ideas of the different features of the website. The main features and concepts drawn up by the lecturer became the basis of the website, but the more they discussed each feature the more clear the

concepts became. So the ID began to ask questions and make suggestions which are then shown on the diagram where different coloured markers were used. Groups of ideas were written in different sections of the whiteboard to represent the new ideas that emerged from the discussion. The diagram began to take shape during the first meeting and ideas were falling into perspective as the ID and lecturer began sharing ideas and carefully looking at the effects, advantages and disadvantages of each proposed section of the website while considering the needs of the users.

The first meeting in team two was chaired by the lecturer who began by explaining and describing the project before actually drawing up the diagram on the whiteboard to assist the ID visualise the interface of the website. After the meeting the ID illustrated her understanding of the ideas expressed by the lecturer in a flow chart on paper that was given to the lecturer during the second meeting. The ID's flow chart provided other alternatives for looking at the features on the lecturer's diagram. The ID's flowchart provided an equal opportunity for both participants to discuss, plan and do other things such as agreeing on new features or altering and deleting others that were already on the diagram.

3.7 Second interview with participants

After the second group meeting, participants (lecturers and IDs) were again interviewed and audio-taped individually for 25 – 30 minutes and the interviews were immediately transcribed. These interviews were semi-structured as the researcher was attempting as much as possible, to obtain relevant information on specific issues in the design process. Lecturers by this stage had begun planning, modifying, editing and revising the resources and subject content to be included in their online websites. The interview questions at this stage were designed to address the following concepts:

- Technical requirements and support.
- Individual role.
- Professional training and planning strategies.
- Team collaboration in the design process.
- Concerns and issues.

The concepts listed above are important to the study because they represent different categories and themes that have been identified as well as the new ones that emerged from the data.

1. Technical requirements and support - addressed issues like, technical requirements and IDs responsibilities, support provided, timeframe for assisting and coaching lecturers, relevance of professional training in the design processes.
2. Individual role - regarding each individual's role, what worked and what did not, specific features of the design process that were of vital importance. Participants had to describe and explain the different features used in the subject website and the reasons behind them as well as the planning strategies used.
3. Professional training and planning strategies - concentrated on the professional training programs that were available to lecturers. Ideas on who was responsible for lecturers' professional training were sought and whether enough training was provided within the limited timeframe. The participants had to express their own desires on the type of training they required and explain their reasons.
4. Team collaboration in the design process - team collaboration was the crux of this study, so the questions required participants to describe their relationship with each other and explain reasons why they thought the relationship was either successful or unsuccessful.
5. Concerns and issues - focused on the concerns, problems and issues that were experienced during the design process. How they solved the problems and what they intended to do if they were to encounter a similar situation.

After the transcriptions were done and analysed, the researcher used other sources such as observation notes, group meeting reports and discussion notes to triangulate the themes and categories by making connections between the main concepts and re-organising the patterns while taking note of evolving categories which were also added into the existing data as illustrated in Figure 3.5.

Additional themes and categories of concepts emerged from the data.

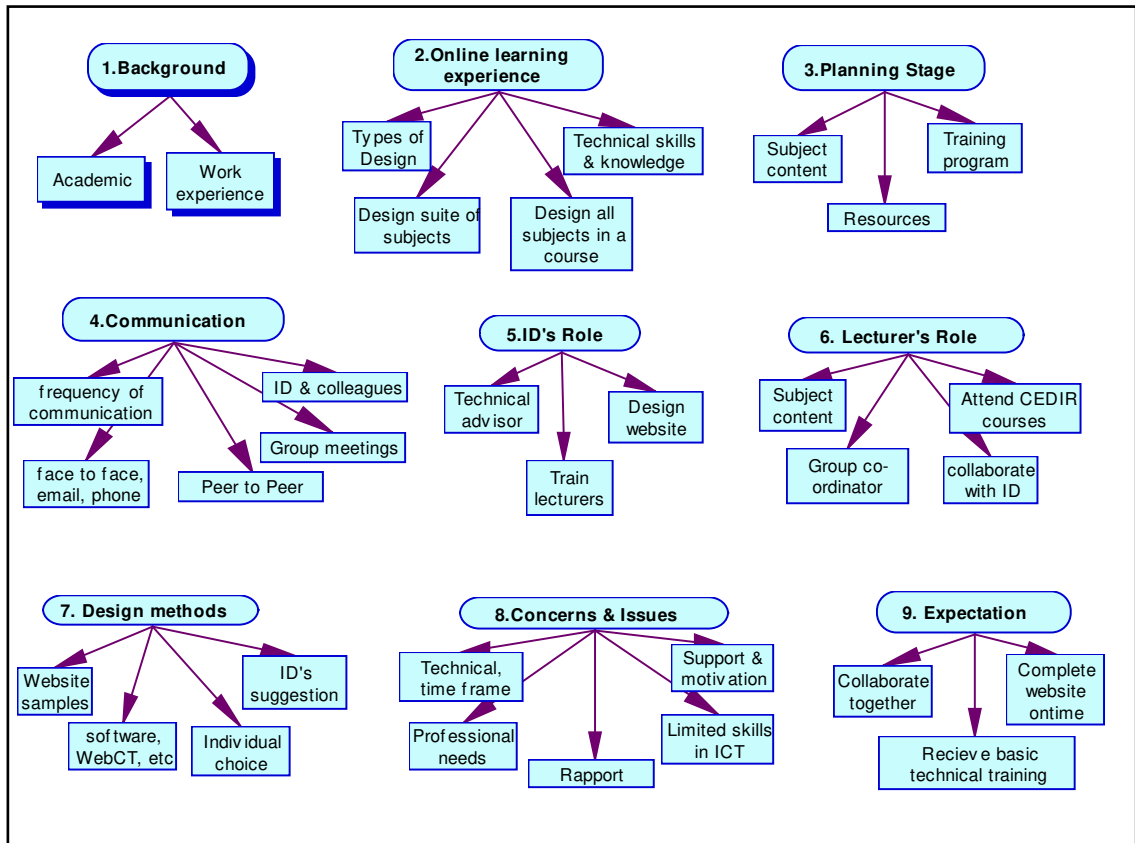


Figure 3.5. Categories emerged from data

Artefacts

Artefacts such as the participants' diagrams and flow charts that were used for planning the e-Learning environments, group meeting reports, subject outlines, emails, observation notes and the researcher's journal and written memos were also analysed according to the themes and categories to provide additional support for the researcher to understand, make sense of the data and identify the different concepts behind them.

3.8 Final interview and reflective report

The final interview focused on the overall design process with the aim to assist participants explain, describe and reflect on the overall experience. This was also an opportunity for the researcher to clarify and corroborate the information that was collected throughout the study. A member check was done where individual participants were asked to confirm the accuracy of information in the record. As a result, participants either amended or added new information and ideas to the data (Lincoln & Guba, 1985).

The final interview occurred 12 weeks into the semester and that provided an opportunity for participants to use their websites before meeting the researcher to describe their experience from the design stage till they used the websites. Participants in team one by this stage felt quite confident and totally in charge of their individual websites. This was also a time to see whether or not they still required assistance from the ID. At the beginning of the session team two experienced some adjustment; the lecturer who had worked all along with the ID had to leave the project due to work commitment and that was beyond the researcher's control, so another lecturer who also had technical skills and knowledge was appointed to maintain and to work with the same ID. The new participant in team two was very enthusiastic about the project just like the previous participant and did work closely with the ID. Hence the final interview was conducted with the new participant after he had spent three months dealing with the course website and the users.

The interviews were audio-taped and the duration of each interview was approximately 15 – 20 minutes. Each recorded interview was again transcribed immediately after it was conducted. The same analysis process as described earlier was done, but in this case the researcher attempted to establish regularities and patterns under the previous concepts and categories while also mindful of the new categories that were emerging from the data (Marshall & Rossman, 1995). As categories and patterns became apparent, the researcher once again searched through the data to seek possible alternative explanations on the credibility and usefulness of the coded concepts. Marshall and Rossman (1995) claimed that:

... as categories and patterns between them emerge in the data, the researcher must engage in the critical act of challenging the very pattern that seems so apparent. The researcher must search for other, plausible explanations for these data and the linkages among them. Alternative explanations always exist; the researcher must search for, identify, and describe them, and then demonstrate how the explanation offered is the most plausible of all (Marshall & Rossman, 1995, p.116).

The researcher re-visited the categories, organised and linked the new relationships and patterns with the previous ones while making it easy to identify and draw meaning from the displayed data (Denzin & Lincoln, 1998). This process assisted the researcher to reduce the data and to organise the information in a way that would permit conclusions to be drawn. At this stage some existing codes were re-named, new categories were added, while others

were replaced. The artefacts such as the diagrams drawn up by participants as planning guides of their websites, observation notes and subject outlines, emails as well as other sources were also carefully examined as supporting sources of the coded categories and sub-categories. It was also another way of verifying the data. Final coding and categorisation of data are shown in Figure 3.6.

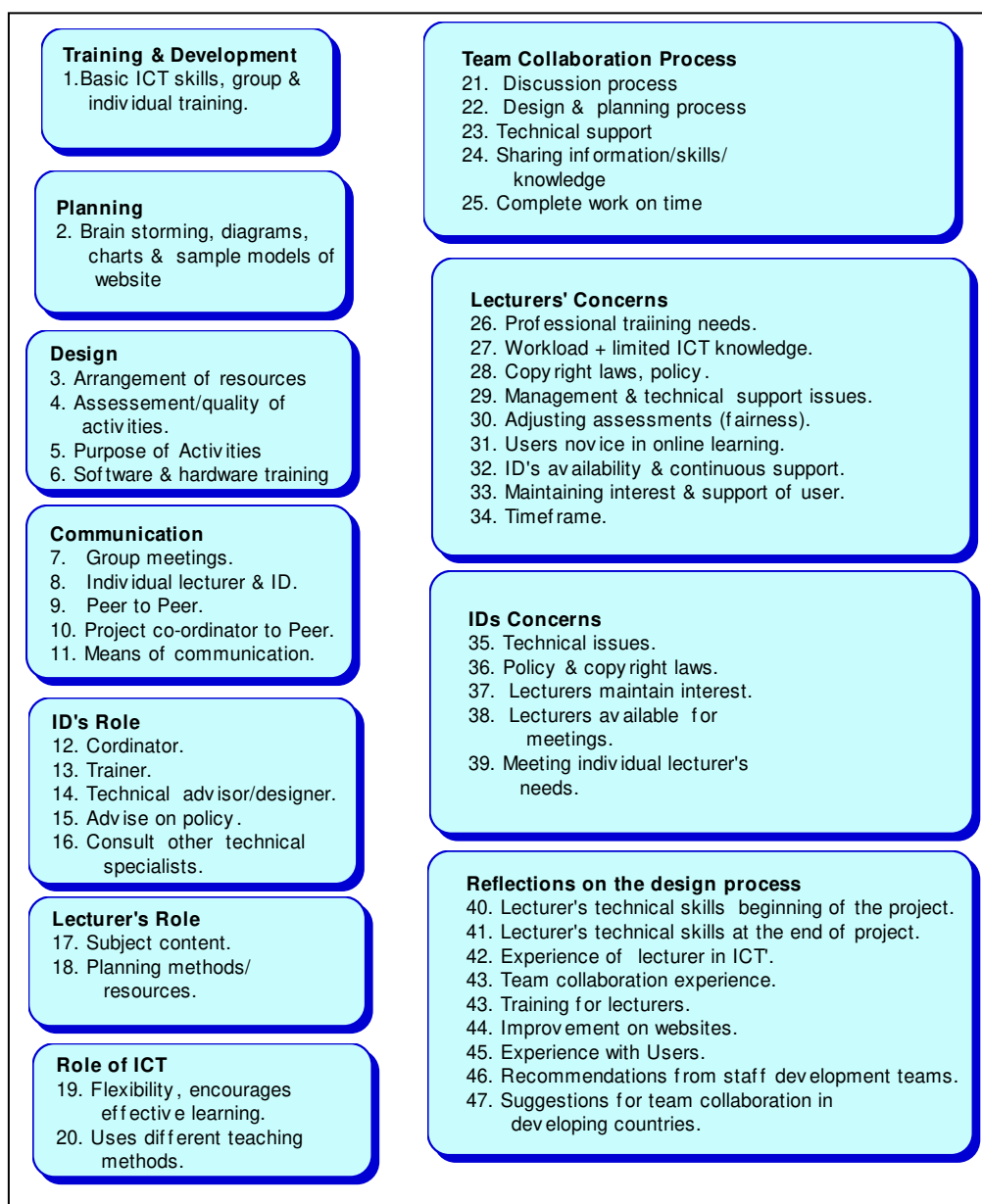


Figure 3.6. Final codes and categories

Triangulation and Trustworthiness of the data

Burns (1997, p.324) defined triangulation 'as the use of two or more methods of data collection in the study of some aspect of human behaviour'. In qualitative research, the researcher always checks the accuracy of the collected data against other sources through triangulation.

Triangulation contributes to verification and validation of qualitative analysis by checking out the consistency of findings generated by different data-collection methods; and checking out the consistency of different data sources within the same method. (Burn 1997, p.324).

In support of this, Lincoln and Guba (1985) stated that triangulation is aimed at obtaining a judgment of the accuracy of specific data items and checking the accuracy can only be done through the multiple techniques of collecting data. Triangulation of data increases the trustworthiness of data and its credibility. Credibility, dependability, transferability and confirmability, according to Lincoln and Guba (1985), are the criteria that increase the trustworthiness of data in a study.

The various data gathering methods employed in this study, such as those interviews conducted with the participating lecturers and IDs in different stages, the observation of group and individual meetings, discussions, collection of artefacts (such as the diagrams/charts outlining their plan; subject outlines; e-reading resources; meeting reports; and email conversations etc) provided enough information for the researcher for cross- checking the accuracy of data that was vital to the study. Triangulation techniques in social sciences attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint and/or using a variety of methods. Triangulation prevents the investigator from accepting too readily the validity of initial impressions.

The researcher is a lecturer in a tertiary institution and was familiar with designing e-Learning environments, had some experience in designing them and understood the design process and how participants were coping.

The final analysis of the data yielded eleven categories and 47 sub-categories. These categories will be described in detail in chapter 4.

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter presents an analysis of the data collected from participants in the two cases. It begins with the research questions followed by the analysis of data.

Data collection and analysis in the entire study were guided by the following research question:

- What professional development processes and strategies do IDs and lecturers use as they collaborate to design e-Learning environments?

To further assist the researcher in the data collection and analysis process, sub-questions were divided into four focus areas as shown below:

Strategies

- What strategies did the IDs and lecturers employ as they worked in teams to develop e-Learning environments?
- How did the IDs and lecturers use these strategies (in meeting, communication and design) in the design process?

Roles

- What were the IDs' and lecturers' views about the roles they play in the design process?

Learning

- What were the IDs' and lecturers' view about the role of ICT in learning?

Concerns

- What were some of the concerns that lecturers and IDs raised before and during the collaboration process?
- How were the concerns addressed by IDs and lecturers?

Throughout the study, the analysis process occurred at different stages and the analysed results have been divided into four parts as follows:

- PART I: Information from preliminary analysis
- PART II: Analysis of strategies
- PART III: Other contributing factors in the design process
- PART IV: Analysis of final design process outcome

4.2 PART I – Information from preliminary analysis

Method of Analysis

The researcher read through the transcriptions, reflected on the data, wrote memos and made notes of recorded issues requiring further investigations. In addition the researcher identified concepts and patterns that emerged from the data. The constant comparative method of analysis (Strauss & Corbin, 1998) was used as the researcher tried to find connections between concepts and link relationships, while focusing on the research questions. The analysed results were obtained from multi-data sources that enabled triangulation of data. Data analysis commenced from the preliminary stage of data collection.

Preliminary Analysis

The preliminary analysis was carried out prior to the first formal group meetings conducted by both teams. The analysed results were obtained from preliminary interviews conducted with the lecturers and IDs. This assisted the researcher to gain an insight into the participants' background, experience and preliminary views on the planned design process. The preliminary analysis focused on the main concepts that addressed the following questions:

- What professional development processes and strategies do IDs and lecturers use as they collaborate to design e-Learning environments?
- What were the lecturers and IDs views about the roles they play in the design process?
- What were some of the concerns that lecturers and IDs raised before and during the process?

The purpose of the study was to describe the roles that two instructional designers played in facilitating the development of online learning environments with lecturers in two case studies. The study also examined how the participants in both case studies collaborated in planning and designing online learning environments. One of the specific objectives of the study was to describe how lecturers who were familiar with technology but were novices in using ICT in the learning environment collaborated with IDs in the design process. Table 4.1 and Table 4.2 show the backgrounds of the participants and the emerging categories from the preliminary analysis.

Backgrounds of the lecturers

The results of the analysis provided information into the lecturers' backgrounds, technological skills and experiences, concerns, perceptions on their roles and expectations on the different types of skills they expected to attain as they collaborated with the IDs in the design process.

	Emerging Categories			
Background	Team one L1	Team one L2	Team one L3	Team two L4
General experienced	Experienced lecturer, subject expert. 20 years as an administrator & lecturer.	Experienced lecturer, subject expert 20 years as administrator & lecturer.	Experienced lecturer, subject expert 20 years as lecturer.	Experienced lecturer, subject expert 15 years as lecturer.
Qualification	PhD	PhD	PhD	PhD
Experience with ICT	Computer literate had very little skills in using technology in online learning environment.	Computer literate but had minimum skills using ICT in online learning.	Computer literate but had no experience in using ICT in online learning.	Very technical and competent in using ICT in online learning.
Role	Group co-ordinator Develop subject website.	Develop own subject website.	Develop own subject website.	Plan website content and work with ID to design it.
Expectations	'ID will provide technical advice, training and support.'	'ID has the technical skills to support me in this project.'	'ID will suggest better ways of teaching the subject online.'	'ID will design more technical aspects of the website.'
Ambitions	'Develop quality online learning resources in the website.'	'Use ICT to provide learning opportunities for students.'	'Develop a website using sound pedagogical methods.'	'The website will be the base for all lecturers to share their ideas.'
Training visions	'Provide technical advice & training. Continuous ICT support'.	'Provide group and individual training.'	'Provide individual technical training.'	'ID will solve technical problems.'
Concerns	'Do not know where to begin the project.' Availability of ID during the project.	'Technical training for lecturers has to be priority.' ID is required to be available at all times.	'ID's availability...' Learning new and advanced ICT skills.	'Getting all the lecturers to use the website.' Some lecturers require technical assistance.

Table 4.1. Background & summary of lecturers' responses

Table 4.1 shows that all lecturers were experienced professionals and were also qualified in their own subject areas. The three lecturers (L1, L2 and L3) in team one were computer literate but said that they were novices in using ICT in the learning environment. The lecturer (L4) in team two had technical skills and experience in designing and using ICT in online learning environments but believed that the ID's technical skills, advice and support were still required in

this task. The two participating IDs were also interviewed and information concerning them is shown in Table 4.2.

Backgrounds of the Instructional Designers

The initial analysis of the preliminary interviews with the two IDs (Table 4.2) revealed similar information as that obtained from the lecturers.

	Emerging Categories	
Background	Team one (ID 1)	Team two (ID 2)
General experience	<ul style="list-style-type: none"> Experienced ID & graphics designer. 17 years experience with ICT. Taught at tertiary level for two years. Current job – ID, works with different faculty members across the whole university. 	<ul style="list-style-type: none"> Experienced ID & graphics designer. 18 years experience with ICT. Developed online learning materials for TAFE, special education training projects. Current job – ID, for a faculty at the university.
Qualification	<ul style="list-style-type: none"> MBA in Management BA Commerce 	<ul style="list-style-type: none"> Bachelor in Information and Communication Technology.
Experience with ICT	<ul style="list-style-type: none"> Had vast experience with ICT in the learning environments 	<ul style="list-style-type: none"> Very experienced in using ICT in the learning environment.
Role	<ul style="list-style-type: none"> Technical advisor, guide and supporter. 	<ul style="list-style-type: none"> Technical supporter, advisor and trainer.
Expectations	<ul style="list-style-type: none"> Co-operation. Clearly outline their goals & plans. Roles done professionally. Lecturers to be interested & motivated. Lecturers to request for assistance. 	<ul style="list-style-type: none"> The lecturer to finalise plans and have resources in place so the website can be completed on time.
Ambitions	<ul style="list-style-type: none"> Complete individual websites within timeframe. 	<ul style="list-style-type: none"> Complete website before beginning of session.
Training visions	<ul style="list-style-type: none"> Courses at CEDIR*. Provide basic technical assistance. No technical training plans. 	<ul style="list-style-type: none"> Provide technical training, support & assistance. Recommend courses at CEDIR.
Concerns	<ul style="list-style-type: none"> Keeping lecturers motivated. Lecturers collaborating as a group. Lecturers accomplishing their roles. Lecturers' busy program. Individual lecturers' needs. 	<ul style="list-style-type: none"> Technical requirement. Timeframe for the task.

Table 4.2. Background and summary of IDs' responses

The interview data showed that both IDs were well qualified and had wide experience in developing e-Learning environments and resources for different levels of education. Their qualifications were not based from the computer science stream but both had more than 10 years experience in designing e-

Learning environments. ID1 was a lecturer at a university in Australia for three years and during this period she taught herself desktop publishing. She worked as a graphics designer and desktop publisher with a company for a couple of years then she had her own graphics and desktop publishing business, which lasted for 6 years. Her company designed e-Learning projects for private companies, schools and projects for the State Government. From this rich experience she is now co-ordinating e-Learning design projects for lecturers in different faculty across the university where this study was conducted. ID2 began her career as an Instructional designer, who was responsible for designing courses for the Australian Defence force for 5 years. She later joined the e-Learning design team for the Education Department in Western Australia where she collaborated with other computer specialists to design educational e-Learning projects for WESONE and TAFE courses. Her current job is to support lecturers as they design e-Learning environments within a faculty at this university. Both IDs had years of experience in designing e-Learning environments.

ID1 described her role as technical advisor, guide and supporter in the design process, while ID2 mentioned the same factors and added an extra role that she was also responsible for training lecturers, which will be explained in more detail later in the chapter. Both IDs had extensive experiences in designing commercial and educational e-Learning training packages for private companies and government departments.

They also had experience in team collaboration and indicated that some of the previous team collaboration projects they were involved in ended successfully while others were unsuccessful. Successful projects according to ID1 had members, especially lecturers, who actually took the time to work with technical people. The design processes took a few months to complete but ended satisfactorily, because the lecturers were able to improve their skills and were confident in using ICT in their teaching. The following statement illustrates the confidence some of these participants gained from the collaboration project:

Some academics come here for help and when you show them stuff they go, oh great, I like that and they kind of run with you and they develop their skills and you have an ongoing work relationship with them and that works really well. At the end of 6 to 12 months, they have a really exciting online product and they are skilled enough to maintain it (ID1, August 22, 2002).

ID1 also emphasised that commitment and a good working relationship are the keys to successful projects. ID2 also had had a number of team collaboration experiences especially in designing online learning resources for TAFE and tertiary level subjects and she described the team collaboration process as a real success because the lecturers who were directly involved in the project were actually working with them in the same room.

...they had desks in the room with us as a team and they were typing up work as we were building the program and when we had questions they were right with us to answer them. It was a great way to learn and work together (ID2, August 28, 2002)

Based on their team collaboration experience in previous projects, they were prepared to work with members of their team. The first thing they both did during the first meeting with team members was to specify their roles and explain to lecturers what they expected them to do. They both anticipated that lecturers would do a professional job and complete it on time.

Analysis process

Issues such as the researcher's subjectivity, the researcher's influence on each case and the credibility of the data were all considered in the study. Steps taken to address these issues included member checking where the researcher presented transcripts and interpretations made to participants for accuracy (Yin, 1994). The audit trail (Yin, 1994) method was also used where the researcher kept records of all activities (field notes, transcriptions, researcher's journal, observation notes, artefacts, etc) to describe the process that occurred. Furthermore an independent review of the procedure as outlined in Table 4.3 was considered appropriate to this research by an Honorary Fellow, Faculty of Education, University of Wollongong, adding credibility to the final categories.

Final categories

The final analysis resulted in the identification of a range of categories as shown in Table 4.3. Eleven main categories were identified and they were as follows: planning, design, communication, team collaboration process, training and development, ID's role, lecturer's role, lecturer's concerns, ID's concerns, role of ICT and reflections on the design process. Table 4.3 below shows examples of these categories.

Categories	Examples
Planning	<ul style="list-style-type: none"> • Brainstorming • Diagram • Sample models of website
Design	<ul style="list-style-type: none"> • Arrangement of resources • Assessments & quality of activity • Purpose of activities • Software & uploading of activities
Communication	<ul style="list-style-type: none"> • Group meetings • Peer to Peer communication • Frequency of group meetings • Means of communication
Team Collaboration Process	<ul style="list-style-type: none"> • Planning & design • Compilation of resources & approval • Technological techniques, skills & support • Among participants, as a group & individual & ID
Training & Development	<ul style="list-style-type: none"> • Basic ICT skills (HTML, Dream Weaver, WebCT & other technical skills) • Group training • Individual training
Lecturer's Role	<ul style="list-style-type: none"> • Plan & evaluate subject contents & resources • Evaluate technical skills • Manage websites
ID's Role	<ul style="list-style-type: none"> • Technical personnel, advisor, trainer & supporter • Link lecturers with other ICT experts • Co-ordinate the task & team members • Awareness - Copyright laws & other issues
Lecturers' concerns	<ul style="list-style-type: none"> • Confusion and uncertainty • Technical skills & knowledge • Specific ICT training requirement • Heavy workload • Value of website to users • Continuous technical support • Keeping students motivated • Fairness on face to face and distance students
IDs concerns	<ul style="list-style-type: none"> • Technical issues lecturers will face • Copyright law issues • Timeframe • Motivation and co-operation • Individual needs and group needs • Ongoing support • Meeting attendance
Role of ICT	<ul style="list-style-type: none"> • Flexibility • Selective methods of teaching • Encourages quality learning
Reflection on design process	<ul style="list-style-type: none"> • Similarities and differences in the two teams • Advantages/disadvantages of group and individual meetings • Training plans for group collaboration • Size of group and group co-ordinator • CEDIR courses • Impact of collaboration and communication strategies • Diagram/charts • Overview of individual roles

Table 4.3. Main categories from the data

The identified categories in Table 4.3 enabled the researcher to interpret the data and to identify the different views and concepts that contributed to the team collaboration process among the participants. It is acknowledged that the categories listed are interrelated and, at times, overlap, but the researcher chose to keep them separate and later in the chapter will explain how they ‘fit’ into the different parts of the study.

4.3 PART II – Analysis of strategies

Introduction

Online lecturers need to have basic technical skills and knowledge in order to effectively develop e-Learning environments. The process of adopting technology in e-Learning environments in this study began with the following strategies: planning, design, communication, collaboration, training and specific roles. Other identified factors that had an effect on the data are as follows: the participants’ background, concerns, reflection and their view of the role of ICT in learning. Each of these categories will be described according to how they occurred within each team.

4.3.1 Planning Process – team one

The data were revised to address the question:

- What strategies did the IDs and lecturers employ as they worked in teams to develop e-Learning environments?




The first requirement for participants in both teams was to plan their individual e-Learning environments. The planning process adopted by both teams differed slightly due to the lecturers’ different technical knowledge and experiences. Lecturers (L1, L2, and L3) in team one claimed that they were novices in planning and designing learning for ICT environments, hence they expected the ID to explain the basic steps of the planning process before they could carry out their roles. They totally depended on ID1 for support, suggestions and guidance. Table 4.4 shows the different planning strategies that were employed by participants in this team.

Categories	Participants
------------	--------------

Planning strategies	L1	L2	L3	ID1
Descriptions				
Brainstorming ideas as a group				
Used chart/diagram				
Shared ideas with peers				
Shared ideas with ID				
Used ideas suggested by ID				
Used own ideas				
Requested support from peers				
Used ideas from website model				
Discussed plans with peers				
Assistance from other technical experts				
Subject outline guided their plan				

Table 4.4. Planning strategies in team one

Key

-  Strategy used, collaborated with others >5 times
-  Strategy used, collaborated with others <5 times
-  Did not seek assistance from others

The darker shades in Table 4.4 indicate where participants spent more time collaborating with other people while the lighter shades show where they met only once or twice with others. L1 and L2 spent more time discussing their plans with the ID and other technical experts but only met three times by themselves to share their individual subject plan. L2 described his role at the beginning as very challenging but mentioned that he was prepared to do what he could and said, ‘I know it will not be an easy journey, but I’m prepared to do my part’, (L1, 18 December, 2002).

L1 expressed concerns and scepticism about his own ability to cope with the new ICT skills and knowledge. He further acknowledged that he was a beginner and a novice in the e-Learning environment but really appreciated the assistance he was receiving from ID1 and the encouragement he was getting from L2. This is how he described his thoughts and feelings before the first meeting.

I was quite worried when I walked into the room during our first meeting. I did not know what to expect. However, ID1 was very helpful and the proposed plan she had for us seemed quite easy for a beginner like me to follow, but we will wait if it is that easy for me (L1, 23 September, 2002).

L1 admitted that they began to meet more often to discuss their individual subject plans with each other and also mentioned that such discussion assisted him to

think more deeply about the type of activities to be included in his e-Learning plans. L2 added that their discussions helped them to explain exactly what they wanted to ID1.

L2 pointed out that as soon as they understood that ID1 would not be available to help them learn the basic skills of using certain softwares like WebCT, he quickly arranged with another ICT expert to assist him to learn these skills. He described his experience working with the ICT expert and ID1 as very challenging because he had to keep up with his plans for the subject while working with the ID expert to improve his ICT skills. L1 also worked with the same ICT expert and said that because they had no time to attend the basic ICT courses that were offered at CEDIR (IT support unit centre) they were fortunate to have this ICT expert work alongside them. Both L1 and L2 were committed to their share of work with ID1 and they did their best to plan their subject contents.

L3 on the other hand was also a novice but was not available at the beginning of the task due to work commitment in another country. She became available towards the very end of the design process and did her best to compile resources for her e-Learning environment. Unfortunately, ID1 could not suggest any major changes to her plans because of the limited time left for the job to be completed. L3 felt that she was not really satisfied and confident with her subject plan due to the limited time left for all online learning environments to be completed:

I wish the activities in my subject were designed differently, but I could not do anything better than what I had on my subject website because I did not spend enough time with ID1 (L3, 3 February, 2003).

She further mentioned that ID1 was not always available when she needed assistance and with her limited skills in using ICT in learning for the first time, it was difficult to plan something more challenging on her own. She described her subject website as the simplest amongst the three subject websites that were designed, and commented that she would just use it and see how it goes.

L1 and L2 did their best to get as much assistance as possible from different sources but as shown in Table 4.4 they still depended more on ID1 and other ICT experts for assistance rather than other experienced lecturers within the faculty, as expressed in the following quotes:

Planning and getting involved in designing a website is something new for me and I expect the ID to help me plan my subject website (L1, February 19, 2003).

The ID was great, she always goes through my work, ideas, plans and objectives before we decide on what I should do (L2, February 18, 2003).

Although L3 was not available at the beginning of the planning stage and did not receive as much assistance as L1 and L2, she also experienced the pressure of planning a website and suggested that all she needed was more support, assistance and advice from the ID, as outlined in her comments:

I'm a novice in online learning environment, so the ID's job is to assist me set up my website (L3, February 25, 2003).

Her statement contained a mixture of frustration and some confusion on her planned website. She was grateful that an ID was around to assistance but expressed concern that she could not learn all the basic ICT skills needed to prepare her to use the online environment. This experience shows that novices need longer periods of time to mingle and work with IDs or ICT experts during the design process. In this situation, last minute work appears to have brought about feelings of frustration, confusion and feelings of discouragement.

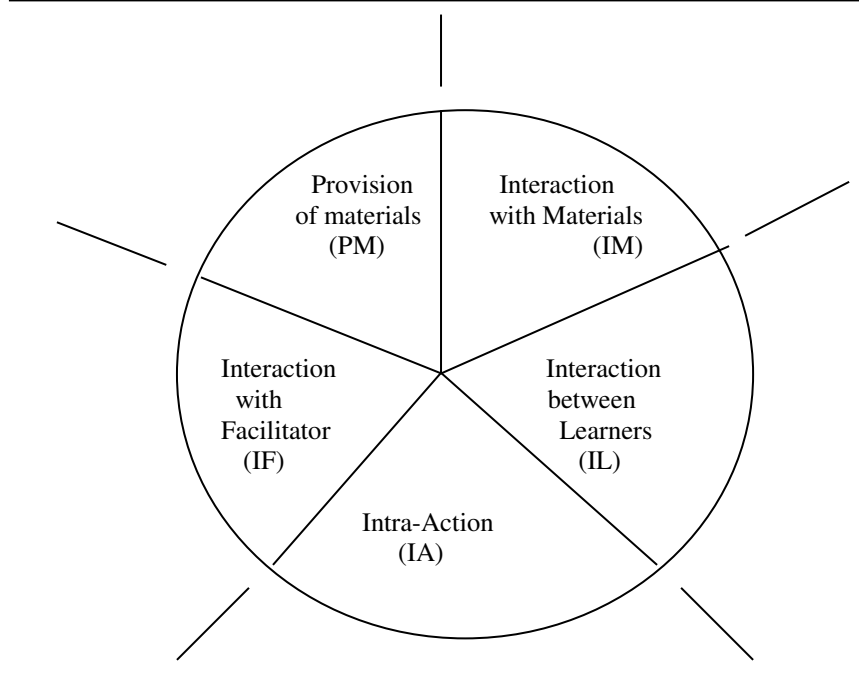
Diagrams and charts - team one

In discussing diagrams and charts it was discovered that participants found these to be quite useful during the planning stage. For example, L1 and L2 were novices in planning a subject website, so ID1 drew a diagram on the whiteboard and included different features as a sample of how to plan a website. Both lecturers were then given copies of a chart (Figure 4.1) that was divided into 5 sections to assist them plan their subject websites.

Teaching and Learning Overview

Lecturer:	Subject:
-----------	----------

Consultation Date:



Issues:

Figure 4.1. Chart used by lecturers in team one

ID1 took the time during the first meeting to explain the different sections of the chart such as:

- Interaction with materials (IM) would assist lecturers to think about effects of the activities on the student learning as they work through the materials.
- Interaction between learners (IL) represented the ways of presenting the tutorials so that learner interaction occurred.
- Intra-Action (IA) would assist lecturers to reflect on their plan.
- Interaction with facilitator, (IF) would guide lecturers in planning activities that would challenge students to get involved in discussions.
- Provision of Materials (PM) challenges lecturers to think about the appropriateness of materials they chose to place online for the learners.

Both L1 and L2 explained that the chart did assist them in some ways with their planning, however, there were some sections of the chart that confused them. For example, L1 stated that the chart was a useful instrument to guide beginners, but added that the ID's explanation was too brief for a beginner like him. He

admitted that the chart did challenge him to think more deeply about his subject and how he would plan more advanced activities and how he managed to fill in most of the sections in the chart except for section 3, (IA, self reflection section). He mentioned that he was unsure about how he would reflect on his work: ‘...I was not sure of the intra-action section so I did not fill it in’ (L1, December 23, 2002). He admitted that he could not question the ID during the first meeting because there was just too much new information to absorb and suggested that they should have had two shorter meetings to help them understand the design process a lot better.

L2 did not attempt to fill in the chart but observed that some parts of the chart did guide his thoughts during the planning process. Instead of using the chart step by step like L1, he chose to begin with the plan of action that was agreed upon by the group during the first meeting and that determined the approach he took.

- We were to produce a study guide for her (ID1) to see and comment on.
- We will go ahead with the production of hard copy of the readings. (L2, December 23, 2002).

Although L2 did not follow ID1’s instruction to fill in the chart, he still described it as a useful instrument. Also, he admitted that some sections of the chart assisted him as he began to plan his study guide:

I began writing my study guide soon after the first meeting which was about 15 to 20 pages which is to become web supported and it will be put on the web. I thought it was appropriate to begin this way then initiate a meeting with ID1 to see my work (L2, December 23, 2002).

In discussing the use of charts with L2, his response was that planning an e-Learning environment is a personal thing and lecturers must be prepared to do a lot of thinking. He expressed that he relied on his past experience in planning a study guide and decided that if he used the same techniques then he would begin putting something together from the action plan before the second meeting. His planning approach was quite different to what ID1 expected from beginners but that ID1 gave him all the support he needed. L3 used the chart as a guide like L2 without filling it in. She admitted that only certain sections of the chart were useful to her but did mention that if she were to revise her chart then she would take the time to fill in the chart.

Another issue relates to the features on the interface of both L1's and L2's subject websites. The planned features for their subject websites were very similar because they were adopted directly from the sample diagram drawn up by the ID during the first meeting. L1 explained the reason for adopting those features as:

ID1 knows the best features to use in an online learning environment so I thought I should just use what she had on the diagram (L1, December 23, 2002).

Such comments appear to indicate that IDs strongly influence lecturers who are new to planning e-Learning environments. This means that IDs have to be very professional at the beginning because their work and techniques of planning influence beginners and set the direction on how they plan their websites. Diagrams and charts were very handy because they guided the lecturers to give more thought about the important aspects of their individual subjects and the quality of resources to be included in the websites. This was a challenging experience for lecturers as they were planning their websites using the charts, as evident from the supporting quote:

The chart helped me in analysing my work. I indicated what I currently do and what I wanted to do in the future and I used that as my basis for my decisions. (L1, December 23, 2003).

ID1 had her own style of leading this group in the planning process. She claimed that her leadership style was unique and this is how she put it:

When I first meet with a group, I always try to understand their background before showing them sample websites designed by other lecturers within the university. I then assign tasks for the lecturers to do while assuring them that I will be providing technical and pedagogical assistance throughout the design process and finally I get them to fill in the chart. (ID1, 22 August, 2002).

She followed her plan as described in the quote above and said that, from her experience, getting lecturers who are novices in using ICT to fill in the chart has been a great way of getting them involved right at the beginning, which makes them feel responsible for the quality of the e-Learning environment.

Sharing ideas and Sample websites – team one

L1 and L2 reported that constantly sharing their ideas with the ID and other technical experts enabled them to select suitable features for their websites. They

also took the time to share their plans with each other and admitted that sharing ideas motivated them, maintained their spirit of co-operation and encouraged them to be committed to their work.

To assist lecturers with their planning, ID1 showed them a few subject websites she had developed with other lecturers as examples of different features and the learning styles that could be adopted. Both lecturers paid close attention when they were being shown these examples but objected to the type of activities in the sample websites. L1 argued that revision-type activities would not be appropriate for adult postgraduate students.

L2 pointed out that he wanted to include essay-type questions that would require his students to engage in meaningful discussions. Both lecturers emphasised during the meeting that their students were mature postgraduate students, so they wanted to design challenging activities that would get them to discuss, summarise and critique ideas. Such attitudes indicated a good start to the design process because, despite having limited skills and knowledge in using ICT in learning, they were already in control of their subjects and were prepared to outline their requirements. Their comments led ID1 to focus more attention on different types of online activities and assessments for adult learners in e-Learning environments.

The lecturers' reaction to the type of activities suggested that they wanted to be viewed as teachers who were mindful of producing great learning resources. Their concerns raised right at the beginning suggested that they knew their students well, and their subject matter. However, they relied heavily on the ID for technical assistance, advice and support. L1 commented after the meeting that he did make some suggestions during the meeting but that didn't mean that he had already figured out what he would do. L2 also mentioned that discussing their ideas during the meeting was easier than working alone, as expressed in his quote:

The planning process was a slow process for me, I started off planning something very simple, but after several meetings with ID1 I finally decided to take a step further and that is to include a chat session (13 September, 2003).

ID1 commented that it does take a while for lecturers, especially novices to put their ideas together so encouraging them to seek assistance from others was the best option to assist participants in the group to put their ideas together.

4.3.2 Planning Strategies – team two

Both participants (L4 and ID2) in team two had experience in designing online learning environments. However, despite being an experienced technical person, L4 still required support from ID2 in the planning stage and this is how she describes her experience:

For me, the exciting thing about ID2 coming on board was having the person to bounce ideas with (L4, January 23, 2003).

She had developed plans and had worked out features that would be included in the online learning environment, but this task was more challenging because it wasn't about one subject but about designing a website that would be used by different lecturers teaching in a graduate diploma course. She remarked that having ID2 to brainstorm her ideas with and to suggest other ways of doing things did assist her a lot. Table 4.5 presents the planning strategies used by L4 and ID2 in the design process.

Categories	Participants	
	L4	ID2
Planning strategies		
Descriptions		
Brainstorming ideas as a group		
Used chart/diagram		

Shared ideas with peers		
Shared ideas with ID		
Used ideas suggested by ID		
Used own ideas		
Requested support from peers		
Used ideas from website model		
Discussed plans with peers		
Assistance from other technical experts		
Subject outline guided their plan		

Table 4.5. Planning strategies in team two

Key

- Strategy used, collaborated with others >5 times
- Strategy used, collaborated with others <5 times
- Did not seek assistance from others

The darker shade in Table 4.5 shows where L4 and ID2 spent more time together to discuss and brainstorm ideas about the plan; they even used a diagram to guide their plan and continued to exchange ideas with each other until the job was completed. The lighter shade indicates that these strategies were used only a few times, (such as browsing other websites to get ideas, getting assistance from other technical experts and discussing the plan with other lecturers). These strategies were only used when required. ID2 revealed that L4 was very active in the design process; she initiated all the ideas and engaged ID2 to discuss, provide input and make suggestions to her plans.

Diagrams and charts – team two

L4 drew a diagram on the whiteboard in ID2’s office to represent her ideas and to help ID2 understand her plan. Interestingly ID2 re-arranged the ideas on the diagram into a table (see Appendix. 230) to help her understand the ideas better which also enabled her to add her own ideas and suggestions, as shown in her remark:

From the information (diagram) on the whiteboard, I drew a flowchart to help me understand the content of the website. This was a challenging project because we were not discussing a subject website, we were dealing with one whole course (ID2, December 23, 2002).

Team two began having frequent meetings that allowed them to discuss, expand, alter and add ideas on the diagram. Both participants had the technical skills and knowledge, so the level of discussion they were engaged in was much deeper.

For example, L4 described the pin board she wanted to include in the website; she

even indicated where it would appear on the website. This idea initiated a lengthy discussion on the size of the pin board, its colour and whether it should appear automatically or a button be created to activate it. L4 felt that the more time spent discussing the features on the diagram the clearer the ideas became, as evident in the following quote:

I found it very adventurous going through the structure again to explain to ID2, because every time ID2 and I do that, something else comes up and makes it much clearer (L4, January 31, 2004).

Both L4 and ID2 described the diagram as a true picture of the course website. L4 commented that ideas on the diagram were altered and improved each time they met. Different coloured whiteboard markers were being used to represent the new ideas that were formed.

Sharing ideas and sample websites – team two

L4 revealed that although she had the technical experience and skills, she still needed and required ID2's advice and support on her design plan. She stated that she was attempting something new which she had never done before therefore she needed another technical expert's input, so ID2 was invited to support and advise her. ID2 discussed different ways of improving an e-Learning environment and to illustrate her point, she retrieved a couple of course websites she had previously created. The first e-Learning course was a technical and future education (TAFE) course and the second one was a commercial online training package. ID2 recalled that it took a while to discuss the different features before they agreed to adopt a few ideas from the sample websites. L4 felt that the design process seemed to be a lot easier after selecting the features of the planned websites. She reported that they began to meet more frequently to share ideas, clarify their views, iron out differences on their opinions and compromise on certain ideas. L4 did share her plans with some of her colleagues who encouraged her to design the course website, but she admitted that having ID2 as an advisor and supporter provided affirmation of her work.

The planning stage required team effort and collaboration among members of both teams. Positive comments and suggestions from both IDs motivated lecturers to carry out their roles in a professional way. As novices in using ICT in learning, L1, L2 and L3 required very basic assistance from the ID right from the initial stage before they could begin planning. L4 on the other hand, began the

planning process on her own right at the beginning by drawing up a diagram that became the point of discussion between her and ID2. The use of diagrams and charts was very important to both teams even though the approach adopted in using charts and diagrams greatly differed. Team one had to use the chart as a guide to plan their work while L4 in team two used a diagram to demonstrate her plan to ID2. The use of diagrams differed because of their different levels of technical experience and skills, but upon completion of all their plans, the diagrams and charts appeared to enable members of both teams to deeply engage in the design process.

4.3.3 The design process

The question addressed in this section was:

- What strategies did the IDs and lecturers employ as they worked in teams to develop e-Learning environments?

4.3.4 Design process – team one

The design process required full co-operation between the participants of both teams in order to produce quality and successful online learning environments. After the first meeting, each individual participant knew the specific role he/she had to perform in the design process. L1, L2 and L3 were required to provide the subject content and e-readings for their individual course websites, resources that would be combined on a CD and readings for their individual subject handbook. Table 4.6 presents the design strategies used by participants in team one.

C a t e g o r i e s	P a r t i c i p a n t s			
D e s i g n S t r a t e g i e s	L1	L2	L3	ID1
D e s c r i p t i o n				
Begin – sorting subject resources				
Begin – search the database for e-reading resources				
Used different assessments				
ID discuss interface with lecturer				

Website management by lecturer				
Website management by ID				

Table 4.6 . Design strategies in team one

Key

- Strategy used, collaborated with others >5 times
- Strategy used, collaborated with others <5 times
- Did not seek assistance from others

The darker shades in Table 4.6 represent the design strategies where participants spent a lot more time and effort discussing, planning and designing. The lighter shades which only appear in one section indicate that the participants briefly used this strategy.

Arrangements of Website content – team one

Each lecturer chose a different task to begin with in arranging the subject content even though they all claimed that they used the chart to guide them. Sample responses to questions about why they began this way are as follows:

- I decided to begin with something easy and familiar (L1, December 23, 2002).
- Compiling e-readings required more effort, especially when one has to search through the database. (L2, December 23, 2002).

Lecturers (L1, L2 and L3) discovered that arranging learning resources and compiling appropriate and current e-readings were time consuming. Despite the extra work they had to do, both L1 and L2 were committed to compiling resources for their e-Learning environments. Their determination enabled them to complete their work at each stage of the design process and send off their individual work electronically to ID1 to check the quality. This is how they described their roles:

I transferred my file to ID1, she had a look at the material and she gave me a number of feedbacks, most of them were positive. She was pleased with the outcome of what I have done (L1, 23 December 2002).

My work was transferred to ID1 by email, so she could look at the quality, its appropriateness for distance education purposes and also to see whether the assessment procedures that I had in place were appropriate for WebCT (L2, December 23, 2002).

Not everyone’s work was thoroughly checked by ID1 for quality purposes; for example, L3, as mentioned earlier, was not available at the beginning and

unfortunately ID1 could only afford to have one meeting with her because of L3's busy program. She described her feelings after the meeting as uncertain towards the task because she knew that L1 and L2 had completed their e-Learning environments and were waiting for her to complete hers. She admitted that she could not set any new and challenging activities in her subject plan because she lacked the basic ICT skills and wished that she had spent enough time with ID1, other technical experts and her colleagues. Interestingly, she decided to improve her ICT skills during the session so she attended two basic ICT courses offered at CEDIR. She commented that she had learnt a lot from this experience and would design a much better e-Learning environment for her students by adding more advanced activities in the next session. In her final remark at the end of the session, this is what she had to say:

I would do things differently next time and I would add more quality activities with the help of the ID. (L3, July 22, 2003).

L1, L2 and L3 realised that planning and arranging the subject content was a great challenge. L3's experience revealed that lecturers who are novices in designing online learning environments, need the ID's assistance and support throughout the design process, and that beginning the process late in the planning cycle creates difficulties for all participants.

Quality and assessment techniques – team one

L1 and L2 were quite concerned about fairness in e-Learning assessment for both face-to-face and distance students. ID1 explained the different types of assessments that could be used for adult learners. She emphasised that care has to be taken when designing assessment in e-Learning. She also outlined and discussed several options for different types of assessments before allowing L1 and L2 to select the assessment style that was appropriate for the assigned activities in their subjects. Her reason was:

I think it is important that deliverers feel comfortable with what they are doing (ID1, December 23, 2003).

Both L1 and L2 understood the workload that would be involved in the type of assessment they were selecting but they trusted ID1's advice that the choices they were making were the best. As shown in L2's remark:

It was my job to select the assessment task and it was her (ID1) input to suggest to me how the assessment task was to be designed to obtain the best result (L2, December 23, 2002).

L3 depended on ID1 to sort out the type of assessment she would use and willingly accepted the assessment scheme that was suggested by ID1.

4.3.5 Design process – team two

Team two approached the design process quite differently to team one, as shown in the shaded cells in Table 4.7.

Categories	Participants	
	L4	ID2
Description		
Begin with subject resources		
Begin with e-Learning resources		
Begin with readings for handbook		
Used different assessments		
ID discuss interface with lecturer		
Website management by lecturer		
Website management by ID		

Table 4.7. Design strategies in team two

Key

- Strategy used, collaborated with others >5 times
- Strategy used, collaborated with others <5 times
- Did not seek assistance from others

The dark shaded cells indicated that both L4 and ID2 took a totally different approach to team one. The design process here mainly concentrated on the structure of the website rather than on the resources. Table 4.7, shows that equal roles were played during the discussion stage and the design stage and that both managed the website right through the design process till completion. The dark shades show that L4 seemed more confident to express her design plans and views, simply because she was more experienced than L1, L2 and L3 in using ICT in learning.

Arrangement of Website content – team two

L4 and ID2 appeared to spend more time discussing the different features of the website and how they would arrange them, and kept altering their plans from time to time when better ideas were discovered. A couple of lecturers submitted their

subject outlines, which were uploaded as examples for others to see. As shown in Table 4.7, they both worked together in every aspect of the design process. L4 commented on the arrangement process as follows:

We continued to refine and alter our ideas and we know that the website will evolve and it doesn't have to be perfect at this point. It has been a great opportunity to share my views with ID2 who is also very experienced in creating online subject content (L4, 31 January, 2003).

Quality and assessment techniques - team two

There was no assessment involved in this website, however, both L4 and ID2 were very conscious of designing a user-friendly website that would cater for all the resources in the different subjects offered in the course. It was L4's job to explain the role of the website to the lecturers. At the beginning, only a few lecturers appeared willing to have their study guides uploaded as examples on the website. As others were not ready to participate at this time, so L4 had to convince them by explaining benefits of the website as shown in the quote:

This website will break down boundaries. WebCT had put us into subject compartments and everybody will know what is happening in another subject, so students don't get all this duplication of activities (L4, 31, January, 2003).

There was a great difference in the design process between the two teams. The lecturers in team one spent more time arranging, sorting and putting together resources while relying on ID1 to check the quality of their work. In team two, L4 and ID2 spent more time discussing every step of what they were going to do.

4.3.6 Communication

Communication was the main component of holding relationships together in the two teams. The communication process started off smoothly at the beginning between members of each team and was kept that way until the end.

Communication occurred in a variety of ways such as group meetings, individual meetings with peers, members emailing each other or some even using the telephone. Participants used different means of communication that will be discussed in this section.

4.3.7 Communication Strategies - team one

Table 4.8, illustrates the different communication strategies employed by participants in team one.

Categories	Participants			
	L1	L2	L3	ID1
Communication strategies				
ID led group discussion				
Lecturer led group discussion				
Group meeting				
Lecturer meet ID				
Lecturer email ID				
Lecturer telephone ID				
Lecturer discuss with colleague				
Lecturer with group co-ordinator				
Lecturer & other IT experts				
ID & other IT experts				

Table 4.8. Communication strategies in team one

Key




-  Strategy used, collaborated with others >5 times
-  Strategy used, collaborated with others <5 times
-  Did not seek assistance from others

Table 4.8 shows that L1, L2 and ID1 communicated more frequently throughout the design process and that L3 did not have the opportunity to communicate as widely with L1, L2 and ID1.

Group meetings – team one

In describing their communication approach, ID1 said that she only had two formal group meetings with L1 and L2. Group meetings opened up the way for both lecturers to share and discuss their views, plans and ideas with the ID. This was also an opportunity for ID1 to make constructive comments and suggestions on each individual lecturer's plans and progress in front of their colleagues. L2's comment suggests that they learnt a lot from ID1 during group meetings:

Her (ID1) comments made during our group meeting concerning my work was very helpful and I've taken that on board and have adjusted my assessments (L2, December 23, 2002).

Both lecturers claimed that the basis of their enthusiasm and motivation for online work came from the encouragement, advice and support they received from ID1, as evident in L1's remark.

She helped us a lot, she's given advice to the group, and she's reacted to our ideas. (L1, December 23, 2002).

Lecturers in team one were novices so discussions held during group meetings provided positive encouragement in carrying out their individual plans.

Lecturer to Lecturer - team one

L1 and L2 had brief discussions concerning their plans for their websites whenever they had the opportunity. Discussions held among lecturers had an effect on each individual's design plans because they enabled them to share and learn from the unique ideas and teaching styles their colleagues were using, as expressed by L1:

L2 and I often discuss our design techniques and plans with each other. He is designing something more advanced and I'm keeping mine as simple as I could but we are both proud of our work (L1, December 23, 2002).

L2 expressed the view that achieving quality in the design process came as a result of the positive feedback and constructive criticisms received from colleagues, the ID and technical assistants.

ID1 suggested that both L1 and L2 successfully completed their tasks because they constantly compared their ideas and provided constructive comments on each other's plans. They supported and relied on each other throughout the design process.

Co-ordinator and peer communication - team one

Having a group coordinator, according to ID1, was like adding extra strength and cohesion to the group. Team one had a group coordinator (L1) who was very active right from day one and constantly communicated with all lecturers and the ID. He kept members posted on meeting schedules and reminded them of due dates via email, telephone, and even met some of them personally. Even though he mainly worked with L2, he still included L3, who was overseas, in all his correspondences. The following illustrates this point:

I coordinate the course and that is the email I sent to them (lecturers), here is the time scale by the 4th of November, you must have started your website, 24th of December the material would have gone to the ID, to 24th of January, any printed materials has to go to the printer, etc (L1, December 23, 2002).

The group co-ordinator was committed and active and had the ability to keep members posted and ensured that work was done. Having a group co-ordinator does not guarantee a successful outcome in a team but it does help members stay focused and work towards the aim of the group. For example:

I have been very busy with other things but receiving reminder notes from L1 made me pull my act together (L3, February 18, 2003)

ID1 believed that a group co-ordinator can have a lot of influence on the group. If he/she is enthusiastic and supportive, most members will be likewise, on the other hand, if he/she is not committed and does not pull the group together, this could have negative impact on group members, especially lecturers who are novices.

Individual lecture and ID communication – team one

L1 and L2 reported that having individual consultations with ID1 and other technical people gave them confidence to carry out their work. They stated that ID1 communicated very well with them, she was very professional and had a very positive attitude towards assisting them, as shown in L1's description:

Having one-to-one consultation was a great idea because sometimes I felt that my ideas were stupid but the ID was kind to show me how it will fit in the learning environment (L2, December 23, 2003).

L2 said that having individual meetings with ID1 created a good rapport between them and assisted him to get to know the ID better. The ID responded that she was also impressed with the positive attitude of the lecturers towards their role and commented that their enthusiasm resulted in an open dialogue between them.

The communication was very clear with this group. They would often email questions or would call me up by phone and discuss issues that were bothering them (ID1, February 19, 2003).

Participants in team one worked and communicated very well amongst themselves as well as with other ICT assistants. L1 and L2 appeared very confident in their work and were both thankful that ID1 allowed them to use their own teaching styles in their plans. The ID only stepped in to advise them on how to structure their plans to suit the online learning environment and to make suggestions where necessary, as shown in L1's remark concerning ID1's attitude:

ID1 was always willing to help me, even when she thinks that my ideas were incorrect and silly, she would never say it to me (L1, July 22, 2003).

Means of Communication - team one

The selection of which communication media to use depended on the nature of the request and job. For example, L1 and L2 mainly used email and the telephone

to communicate with ID1. L1 only met with the ID once but mostly used the telephone to discuss and sort out his queries. L2 mostly used the email to communicate with the ID and only used the telephone to ask simple questions. He also had three individual consultations with the ID. This shows that each lecturer depended quite a lot on the ID for support, advice and assistance. L3 only had one meeting with ID1 then exchanged a couple of emails with her.

4.3.8 Communication Strategies – Team two

The lecturer and ID communicated between themselves during the design process then extended the communication process with the users (lecturers).

Category	Participants	
	L4	ID2
Communication strategies		
Description		
ID led group discussion		
Lecturer led group discussion		
Group meeting		
Lecturer meet ID		
Lecturer email ID		
Lecturer telephone ID		
Lecturer discuss with colleague		
Lecturer with group co-ordinator		
Lecturer & other IT experts		
ID & other IT experts		

Table 4.9. Communication strategies in team two

Key

Strategy used, collaborated with others >5 times

Strategy used, collaborated with others <5 times

Did not seek assistance from others

The darker shades in Table 4.9 show that the lecturer mostly facilitated the communication between L4 and ID2 in a face-to-face manner. The method of communication was quite different to those in team one. The reasons may be explained firstly by the fact that there were more members in team one than in team two and secondly, lecturers in team one were mostly novices in using ICT while the lecturer in team two was quite technical and was able to instigate plans and discussion.

Group meetings – team two

L4 and ID2 met quite frequently because their offices were located very close to each other. The close proximity of their offices enabled them to discuss and share

ideas whenever they had the time in their busy work schedules. They still made appointments if they wanted to spend more time in discussing the task. They both reported that continuous discussion helped them to refine and improve the structure of the website, as the following quote illustrates:

Taking the time every now and then to discuss with the lecturer was a good way of working out what facilities and functions were appropriate for the website (ID2, July 22, 2003).

L4 claimed that spending lengthy time with ID2 in exchanging and sharing ideas helped to speed up the design process. She also made mention of how easy the design process becomes when an experienced ID is available to support and assist in every detail of the design plan.

Lecturer to lecturer – team two

L4 worked alone with ID2. Her colleagues' positive responses and suggestions on what they would like to see included in the website encouraged her to keep working on it, as shown in her remark:

People were quite happy with the idea and made very positive comments on what they would like to see and that was encouraging (L4, January 23, 2003).

L4 mentioned that she raised the idea with all lecturers teaching in the courses during their meeting and actually showed them the CD resource collections made by students which she described as the upfront resource for the next cohort of students. She said:

What you do with the CD is, you top up and you can communicate through the process each year of the resources, you can walk back through the CDs and see the evolution, not re-inventing the wheel (L4, January 23, 2003).

Throughout the design process, L4 kept in touch with the lecturers, which actually motivated her to pursue her plans and complete designing the online learning environment.

Means of communication – team two

They mainly met face-to-face and used the email to contact another technical expert (programmer) who also worked in the faculty. ID2 mentioned that they had more frequent meetings apart from the two official appointments they set at the beginning during the planning stage.

The communication process observed and reported by subjects was as needed. The only exception was L3 who claimed that it was not easy for her to communicate with ID1 as she felt that ID1 was busy and did not extend the time to assist her at the last minute. Both IDs tried to communicate with individual members of their team as much as possible. The communication flow in team one was kept alive by the group co-ordinator who was like a link between lecturers and the ID, while team two only had two members so communication was fairly easy.

4.3.9 Collaboration process

The design process was based on team collaboration efforts among all participants. This indicated that participants depended on each other throughout the process.

4.3.10 Collaboration in team one

L1, L2 and L3 had to be involved in the task for the following reasons:

- They had received confirmation that prospective distance students (from Australia and overseas countries) would enrol in the course.
- The Faculty Dean had approved the online component of the course, so it was their job to make it happen.
- They were required to carry out their roles, while learning and mastering the basic technical skills. L1 and L2 worked very closely with the ID and the technical assistant and took all the changes and opportunities to ask questions and learn from the ICT experts.

Collaboration in planning and designing – team one

The planning process was challenging because it required a lot of discussions and input from lecturers, the ID and the technical assistants. L2 mentioned that although planning was a personal thing, he could not do it on his own and still required ID1 to check his plan at different stages before it was included in the website, as illustrated by the quote:

When I decide to attempt something new, I usually sit with the ID and explain my ideas to her. She then listens and tells me how it should be done and why it should be done that way. (L2, September 13, 2002).

The process of checking L1 and L2's website plans became part of the process because both lecturers wanted to ensure that their websites were appropriate and met the e-Learning standard, but still contained their unique, professional teaching styles. Thus, the planning and designing stage was collaboratively carried out between lecturers and IDs:

The academic has to do three times as much work as we do, right from the beginning, until we reach the final product, if not five times as much, it depends. Academics decide on how they want to teach the subject and when they have planned it, we then advise them on some techniques and tools to use and how to structure it (ID1, February 19, 2003).

L1 claimed that planning and designing could not be done by the lecturer(s) alone, that it has to be a collaborative job between lecturer(s)s and the ID. The following supports this view:

You cannot do it alone you need support from experts who have experience in technology and online learning (L1, September 13, 2002).

L1 and L2 rarely added new features without the ID's approval. L2 explained that they knew their roles but there were times where they needed the ID to lead them. L2 expressed his idea about their team effort in the quote below:

I think it was a very important teamwork. It is a teamwork that has its boundary. The boundary being as follows: The production of the materials and the production of the readers in my judgement is the ambit of the academic. However, the advice in instructional design should come from those who have more experience in the instructional design (L4, January 31, 2003).

Technical issues during collaboration – team one

When L1 and L2 realised that technical assistance would be available to them as the need arose they changed their initial negative attitudes and ideas about seeing technical issues as a big challenge during the design process. The constant support and availability of ID1 had a positive impact on both L1 and L2; it encouraged them to keep pursuing their goals because they knew that their technical problems would be taken care of.

I have planned something quite different from the other lecturers and this is what I want to see in my website and I'm going to do it because I know that ID1 will help me sort out the technical issues (L1, September 13, 2003).

Collaboration with individual lecturers - team one

Both lecturers explained that receiving individual advice and support from the ID was very effective and it helped them to understand their roles a lot better. Working on a one-to-one basis enabled individual lecturers and the ID to clarify ideas and to decide on the most appropriate way of presenting them on the websites. For example, L2 made a special request to ID1 to pass on his work to other technical members of the team to check the quality and provide feedback. When asked why he did that, he replied that he wanted to get a ‘second opinion on his work’. L2 noted that he trusted ID1 but he still wanted to hear other technical experts’ comments. ID1 invited two technical experts to review the work and directly report their feedback to L2. This made use of the experience and skills of the experts and added more credibility to the process. The following quotes are about the role of ID1:

ID1 has been really good, she’s being very available to us and she’s got a very good style, even if she thinks you are not thinking well, she will never reveal it. She is very positive and pleasant (L1, December 23, 2003).

The lecturer and I worked on the plan collaboratively and we both had our own ideas and we worked through those before we came up with this design. (ID2, July 22, 2003).

ID1 is so helpful and flexible. (L3, February 18, 2003).

ID1 claimed that working individually with lecturers was the best way to really understand their level of technical skills and problems, which makes it easier to suggest solutions or alternative ways of doing things. L2 described their courage to try new methods of teaching as a result of receiving prompt and positive responses from the ID and technical assistants. Despite being novices, the good rapport with ID1 enabled them to attempt more advanced assessment techniques that they had no experience in.

4.3.11 Collaboration – team two

L4 initiated the idea of designing a course website but she needed someone to brainstorm her ideas and assist her design the website. She was concerned that lecturers teaching in the course may not appreciate the potential of the website and may not collaborate with her during the design process. Despite doing something new and challenging she was very positive, enthusiastic, motivated and commented that she had no doubt that working with ID2 would provide the best result:

ID2 shared my aspirations and understands the problems I've been experiencing and having someone who shares your ideas is just great. ID2 has made very valuable suggestions which has given me confidence that this website will be a success (L4, January 23, 2003).

ID2 noted that working with lecturers who have the technical knowledge is not always easy and straightforward. For example, L4 was quite technical and looked at certain issues from a different angle to ID2's ideas and views, but they sorted out their different views through the process of constant discussion and collaboration. As expressed by ID2:

The lecturer and I always go through the work, ideas, plans and objectives before we decide on what each of us should do (ID2, July 22, 2003).

Technical issues faced during collaboration – team two

L4 and ID2 spent a lot of time discussing the structure and features of the website without really touching on the technical issues because that was left to ID2 and the technical assistant to deal with. L4 only focused on the planning side because she trusted the ID to do the rest for her:

The benefit of discussing with the ID is someone else who believes we might be able to do this. Who can carry the technical load, and can seek the support, link with people about very specific issues (L4, January 23, 2003).

L4 stated that ID2 was very capable of sorting out the technical aspects of the planned website. She did call on another ICT person to assist out but that only happened after the planning was done. A good flow of communication was the key to the successful completion of each individual online learning environment. L1, L2 and L3 had different levels of technical skills at the beginning of the design process and were quite concerned about whether they would be able to design a good website. They discovered however, during the process that the more they communicated and expressed their desires and problems with the ID and other technical experts the easier the work seemed to be because of the assistance, support and advice that was provided to them. L4 agreed that continuous discussion with the ID made ideas clearer.

4.3.12 Instructional Designers' Role

The question that guided the information for this section was:

- What were the IDs' and lecturers' views about the roles they play in the design process?

It appears that both IDs had strong views on the role they had to play with lecturers in their team.

4.3.13 ID's role in team one

ID1 was aware that the lecturers in her team were novices and would be depending on her expertise throughout the design process, so this is how she described her role:

Part of my role is almost like doing a psychological assessment of where the lecturer is at, work collaboratively with him or her in designing what they want on their websites and see how far I could move them forward technically. I see my role as a coordinator and technical advisor (ID1, August 27, 2002).

The university had policies and guidelines that lecturers and IDs have to abide by, and ID1 explained that she would only work with individuals or a group of lecturers whose courses are approved to go online by their Faculty Dean or the course co-ordinator. ID1 co-ordinates a number of online projects right across the university which means she could only allocate a few hours per week for each project based on what is called a Faculty service agreement. She explained this in the quote below.

Because of staff limitation we have a thing called a service agreement. We need the faculty to rank jobs in order of priority and that's important because we need faculty to approve, to commit, and say yes these courses are very important to us (ID1, August 27, 2002).

ID1 explained that when lecturers sign the service agreement form, they are committing themselves to collaboratively work with the technical team under her leadership until the end of the project. ID1 was a very busy person but despite her busy program, she was committed in supporting and assisting L1, L2 and L3 design their e-Learning environments. L1 and L2 reported that she was very professional in her approach. For example, L2 commented that: she always made positive responses to our plans, her prompt response to our queries, pleasant personality and firm working standards gave us assurance that our work will be successful (L2, September 13, 2003).

Engaging other technical specialists – team one

ID1 mainly checked the structure of each lecturer's plan as well as the quality of the resources for their subjects. She did not provide any form of technical training because of the following factors:

- Lecturer's busy schedules.
- Time limitation on the service agreement period.
- Free basic technical training courses were available at CEDIR (Centre of educational development and interactive resources) and she expected L1, L2 and L3 to attend some of those courses.
- The technical team working with her would design the website for the lecturers.
- Another ICT staff provided the basic technical training to L1 and L2.

ID1 emphasised the courses at CEDIR on a number of occasions but L1, L2 and L3 had no time to attend any of the courses during the teaching session. Even though L2 and L3 were novices, they included some advanced pedagogical techniques in their websites, such as having students involved in both synchronous and asynchronous discussions. ID1 was concerned as shown in her remark:

I'm quite concerned about L1 and L3 because they have no experience in co-ordinating a synchronous discussion. They should have attended the discussion course offered at CEDIR but anyway, it is up to them. I cannot force them and they will just have to learn from their experience I guess (ID1, February 23, 2003).

L2 told the researcher that using advanced ICT techniques in his website was a challenge but he was prepared to use it because he knew technical assistance would be available when he needed it.

L1, L2 and L3 saw ID1 as an expert they trusted and depended on for ICT support. ID1 on the other hand, admitted that she was not an expert on everything to do with e-Learning and was prepared to invite other available experts in specific areas to provide advice to the lecturers, as illustrated by the quote below:

What they will probably need during the session is support for WebCT and the discussion, which I'm not actually that qualified to give them. I'm going to pass them on anyway and not tell them this now because I don't want to pick them out but I'm not an expert in that area (ID1, July 23, 2003).

ID1 was able to maintain the lecturers' trust as she continued to encourage and assist them sort out their design plans while working closely with them during the service agreement period.

Website Management – team one

L1, L2 and L3 emailed their subject resources to ID1 who passed them on to the technical people in the department to upload them on the three websites and prepare the CD. Upon completion of this process, lecturers were given passwords to access their websites. As mentioned earlier, no additional basic ICT training was provided after that to assist lecturers manage their websites. ID1 mentioned that the websites were set up in a way that very little management would be done by lecturers because this was their first time to use an e-Learning environment. The reason was to allow them to concentrate on using the website instead of getting involved with ICT technical problems. L1 and L2 were comfortable with this plan because they knew that if they encountered any ICT problems during the session, the ICT experts who had been supporting them would be available to assist them.

ID1 explained that she would only provide full support and assistance to L1, L2 and L3 during the service agreement period, and after that she expected them to begin using their websites using the basic ICT skills they had learnt from the technical assistant. She knew that lecturers needed assistance with basic ICT skills, but due to lack of time she could not assist them. Instead, she consistently encouraged and reminded the lecturers to attend the free basic ICT courses run by CEDIR. L3 planned a very basic website and because she did not receive any form of basic ICT training during the design period, she stated that she did not have the confidence to run the online courses. She further stated that to make up for her lack of ICT skills she had to attend two basic ICT courses at CEDIR during the session which were helpful. L1 and L2 on the other hand, were quite content with the basic ICT training they had received during the design process and were confident that these skills would help them manage their websites during the semester.

ID's role in copyright law - team one

The copyright law issue was the first warning message from ID1 to the lecturers. She emphasised the rules they should know, and advised them to seek assistance

from the faculty librarian. Warnings about important issues such as the copyright law and using the most current resources indicated that ID1 wanted lecturers to produce professional and quality e-Learning environments. The lecturers had no problems with copyright law and other related matters such as the best way of displaying resources on their websites, because ID1 and the librarian advised and directed them.

4.3.14 ID's role in team two

ID2 described her role in the design process as follows:

I see myself acting as to some extent a mediator, a collaborator. I don't see myself as taking over the design, I see myself as merely working with them in what they want to do or as somebody who has to undercover what they want to do (ID2, August 28, 2002).

ID2's view concerning her role was different to ID1's view because her main role within the faculty was to provide technical support, assistance and basic ICT training as required by one or a group of lecturers. For instance, she explained that providing basic ICT training would enable lecturers to be responsible for managing their websites and not run to her every time to do simple things, which they could do themselves. This is how she explained what she has been doing with lecturers in the faculty:

Lecturers in different subject areas within the faculty call on me when they need to design a website or just to upgrade and add new features on their existing websites. I'm always available to help and they know that (ID2, February 27, 2003).

Engaging technical experts – team two

L4 included some advanced ideas that required some programming, which prompted ID2 to invite a technical programmer to provide additional assistance. ID2 admitted that she was not an expert in all technical areas and to have quality in the website meant inviting a technical specialist to cater for the required design, as shown in her remark:

When more technical things are involved, I try to direct people to go to Bill (technical specialist for the faculty) he is more a web developer than I am, and he has a much better handle on the real nuts and bolts of programming (ID2, July 22, 2003).

L4 and ID2 designed the basic navigation of the website and the basic features and structure but depended on the programmer for more technical issues:

L4 and I worked on the basic navigation of WebCT, just the basic structure of the course in WebCT and Bill (programmer) is going a level down by working on the actual web page and some of the things like the pin board (ID2, February 19, 2003).

The technical programmer created the pin board in the website then left the rest of the work for L4 and ID2 to complete. L4 reported that adding and uploading resources to the website was done by either herself or ID2. They also held a group meeting with the users (lecturers) to explain the role of the course website and its effect on the course. L4 facilitated the group meeting and demonstrated the different features of the course website to the users (lecturers). She reported that lecturers were very open about their lack of ICT skills and freely requested ICT assistance. ID2 demonstrated some simple techniques on how to upload, download and edit their work on the course website, but emphasised that she would be available to provide both group and individual assistance when required. She further urged lecturers to seek assistance from other ICT experts within the faculty if she was not available.

Website Management – team two

The management of the website was L4's responsibility but, unfortunately, a few weeks after the course was completed, she left the faculty due to work commitments in another department in the university. Another lecturer (L5) within the faculty who also had technical skills and experience in using ICT in learning was appointed to manage the website. This was a challenge for the new lecturer but he was acquainted with the role of the website and requested assistance with a Web Page authoring tool from ID2. The ID not only assisted L5 with the required skills but also provided basic html skills-training to another lecturer who supported the course. ID2 said:

I had to teach some html skills, well help the lecturer with html and L5 with Dream Weaver. Yeah, it is a time consuming thing to do, it is something I had to do (ID2, July 22, 2003).

ID2's approach in the design process was quite different because she went as far as providing basic technical training to lecturers to equip them with basic skills of managing their individual websites. The course co-ordinator realised the importance of providing basic ICT training to lecturers using the website so they appointed L5 to take care of that matter. L5 was supportive to all lecturers and

began providing individual IT training which lecturers appreciated. He reported that providing individual training was more satisfying to lecturers than putting instructions up on the website for them to read and follow.

L5 mentioned that some lecturers began using the website from the beginning, but lost interest when the main university server crashed after a month into the session. The particular server was restored after four weeks but most lecturers did not even make an attempt to use it again. L5 realised the challenge of encouraging them to use the website, so instead of urging them to use the website he changed his approach and asked them to outline certain features that they would like to see on the website and interestingly they began to provide many ideas. He described this approach as the key to encouraging users to participate, for example, he used their ideas to alter the homepage and make it look more like a community centre for both lecturers and students as shown in Figure 4.4. He said that a few more lecturers showed interest and began sending in resources to be uploaded to the website while others began requesting ICT assistance and training. L5 is now committed to assisting lecturers on an individual basis but said that it was a time-consuming and slow process. He added that providing training does not mean that they will show interest and use the skills they are learning in their work. This is how he described the situation:

This website is supposed to be their one-stop shop, that's the way it was meant to be. I think the lecturers haven't made as much use of it as they could have (L5, 28 August, 2003).

L5 reported that the situation did improve as time went by. He noted that adding lecturers' suggestions to the website made a lot of difference to the keen lecturers. Secondly, it provided basic ICT training to groups and individual lecturers and did encourage some others to begin using the website. However, less confident staff would still take time to experience the potential of technology to support their subjects. Therefore trainers should not be disappointed if not all staff adopt ICT to support their teaching.

ID's role in copyright law – team two

ID2 actually made up a list on copyright law issues to assist lecturers (L4, L5 and the users) and this was very helpful to lecturers attempting e-Learning design for the first time:

Most resources from lecturers were uploaded right away but if we had questions on any of the documents, one of us would always seek advice from the Librarian (ID2, 25 August, 2003).

Both IDs were very professional in their approach towards lecturers during the design process; for example, ID1 explained the design process to lecturers, got them to do their part, then screened the quality of resources from lecturers and engaged the technical team to design the website. ID2 collaborated closely with the lecturer and even provided basic ICT training. Both IDs involved other technical experts to assist in the design process.

Lecturers' role – team one

L1 and L2 reported that producing a quality and professional e-Learning environment required a lot of preparation. For example, L2 spent a lot of time searching through databases and photocopy resources, but claimed at the end that he wished he had had an assistant to assist him do some of the work. L1 also spent a great deal of time sorting out e-reading resources and commented that it was time-consuming. They both wanted to have current and quality resources for their students so that they were willing to commit their time and effort to the task. L3 was late starting but she also agreed that planning of resources was time-consuming and described her experience as 'bad' simply because she had to rush the preparation of her subject.

Technical skills and requirements – team one

Lecturers in team one were computer literate and could use the computer to type up their work, send emails and surf the Internet, but the concept of using ICT in learning was an extra skill they had to master. The technical challenge of creating an individual subject website did not seem very easy at the beginning, but despite their fears, they persisted. As L1 explained:

You must overcome your fear and you have to have competence for using technology (L1, December 23, 2002).

ID1 expressed that it was exciting to work with lecturers who are so enthusiastic about their work. She observed that both lecturers (L1 and L2) took their role seriously and requested assistance as soon as they encountered problems. This is how she explained her experience:

People with basic computer skills like this group is just fantastic, they kind of run with you and they develop their skills and you have an ongoing relationship with them and that works really well (ID1, February 19, 2003).

Lecturers' role – team two

L4 spent a great deal of time discussing with ID2, the most appropriate features that would encourage lecturers (users) to use the website. L4 reported that nearly every decision about the structure of the website was made collaboratively between them. When L5 took over the responsibility, he also depended on the lecturers and students to contribute to the website and he continued to maintain it while seeking technical advice from ID1. However, L5 reported that the plan of getting lecturers to contribute was happening at a slow rate but at least more students and lecturers did take the time to use it.

Technical skills and requirements – team two

Team two's approach in the planning and design stage was based on collaboration between L4 and ID2. When they agreed on certain matters to be included in the website, L4 would leave the office while ID2 began working on the suggested concepts. During the planning and design process all technical matters were handled by ID2 and she would only consult L4 if further clarifications were required. Upon completion of the website, there was a reversal in roles; L5 took over all the technical matters from ID2. When asked why ID2 was no longer involved, his explanation was:

I think ID2 has purposely stepped back away from it and she is saying, 'now I've done my part, I will now let it evolve and see how it goes,' but there are maybe some issues where she might come back in and say, can we do so and so, I might contact the programmer Bill and say, 'can we do this,' so he and ID2 might work together to say, it might look better if we do it this way (L5, July 15, 2003).

This statement indicates that L5 was very comfortable in dealing with the technical issues because he knew that ID2 would provide ICT assistance whenever he needs it. ID2 admitted that giving full responsibilities to L5 worked according to her plan for the lecturers in the faculty. Her aim was to train and support individual lecturers to handle basic technical issues in the e-Learning environment.

4.3.14 Group Co-ordinator's role

Team one had a group co-ordinator, as stated earlier, who was also a participant and had to create his subject website just like his colleagues in the group. The group co-ordinator in team one was the key figure in the design process. He described his role as being to sort out the course policy, maintain the group's focus by checking with all members to ensure everything was on track according to schedule, and ensure that a good relationship is maintained between the lecturers and the ID. As indicated by ID1:

L1's involvement as a coordinator of that program has been for me particularly satisfying because it just provides some leadership and direction and cohesion. And if L1 says at the end of the day, 'we are going to do this' then most likely it will happen. That for me is particularly important and satisfying (ID1, July 22, 2003).

L1 admitted that being a group leader was a challenge. He had to ensure that everyone was working together with the ID to achieve the group's objectives, while managing his own work, as quoted in his remark:

My role is to sort out policy for the course then to co-ordinate it, then to get my own act sorted out which is planning the design of my subject website (L1, December 23, 2003).

L3 admitted that she was not very comfortable with the use of ICT in her subject; in fact, she questioned the new ideas that ICT would bring to her professional teaching style. The group leader clearly pointed out that although they were all novices they would work together with the ID to design their individual online learning that would help them cater for the growing number of distance students. He mentioned that there was no real choice because the ID and other ICT experts had agreed and were available to assist the group. L3 described her experience as a challenge at the beginning but great at the end because it did help her to like technology. She particularly expressed her appreciation to the group co-ordinator for encouraging and reminding her to work along with the group. Most novice lecturers understand the benefit of ICT in learning but due to lack of technical knowledge they fear that they cannot master the skills, so having a group co-ordinator provides cohesion and support to individual members.

Team two did not have a group co-ordinator because the lecturer was quite technical so she ended up collaborating with ID2 throughout the design process. ID2 mentioned that she supported the idea of having a group co-ordinator if there

are more than 3 members in the group, and especially if some members are novices in using ICT in learning. She agreed that a co-ordinator must be active and one who would be able to encourage and pull members to work together. She also emphasised that novice lecturers can easily get discouraged and question the use of ICT in learning if they feel that they are not getting enough support. Thus, it is important for ICT assistance to be close to them during the design process.

4.4 PART III – Other contributing factors in the design process

4.4.1 Concerns

Questions revised to address the following issues were:

- What were some of the concerns that lecturers and IDs raised before and during the collaboration process?
- How were the concerns addressed by IDs and lecturers?

Lecturers had a number of concerns at the beginning of the design process. Some of these concerns and issues were easily solved with the assistance of the IDs while others took longer to solve, as shown in Table 4.10.

Feature	Similarities	Differences
Fairness in assessments	<ul style="list-style-type: none"> • Very concerned about fairness and wanted to select the best type to suit individual subject. • Satisfied with content of website. 	<ul style="list-style-type: none"> • L1 –satisfied with choice of assessment, still concerned until students begin using it. • L2 -very positive and confident. • L3 – satisfied with assessment but wasn't so confident like P2; had doubt, uncertainty. • L4 's website was based on a different structure, assessment not required.
Extra workload	<ul style="list-style-type: none"> • All lecturers were well aware of the extra work involved in using ICT. 	<ul style="list-style-type: none"> • L1, L2 & L3 - concerned about participating regularly & extra marking that will be done.

		<ul style="list-style-type: none"> • L3 – website management. • L4 -website management, prompt response to lecturers’ requests and ICT needs.
Technical skills	<ul style="list-style-type: none"> • L1, L2 & L3 - not confident at the beginning, very limited ICT skills. • All lecturers received assistance from IDs and other ICT experts. • Lecturers planned individual website. • Server crashed- lost their work. • IDs requested assistance from other ICT specialists. 	<ul style="list-style-type: none"> • L1, L2 & L3 - very confident at the end, wanted to improve their websites. • L4 - concerned about the limited technical skills of users. • L1, L2 & L3 - continued to use their websites after the server crashed. • L4 – discovered that most users refrained from using the website after the server crashed.
Copyright law	<ul style="list-style-type: none"> • All lecturers sought assistance when not sure on certain resources and issues. 	<ul style="list-style-type: none"> • L1, L2 and L3 sought advice for copyright law issues on their own. • L4 relied on ID2 to fix copyright law issues. • L5 screened everything for quality and copyright issues before uploading them to the website.
Technical training	<ul style="list-style-type: none"> • Individual ICT training was conducted upon request. 	<ul style="list-style-type: none"> • L1 & L2 requested more for ICT assistance than others. • ID1 – did not have time to do individual training, someone else stepped in. • ID2 – conducted training.
Value of the website	<ul style="list-style-type: none"> • Everyone did their best to produce professional and quality websites. • Lecturers and students found that websites are very useful. 	<ul style="list-style-type: none"> • L1 & L2 - were satisfied with their websites. • L3 – wished more activities were added. • L4 –was satisfied with the website but knew that lecturers required ICT support and training. • L5 – not all lecturers were seeing the potential of the website.
Timeframe	<ul style="list-style-type: none"> • Limited time for everyone 	<ul style="list-style-type: none"> • L1 & L2 – Spent a lot of time & effort. • L3 – did not spend a lot of time to create the tasks included on the website. • L4 – ID did most of the work but was not so concern of the due date. • L5 – tried to provide ICT training as much as possible.

Table 4.10. Concerns expressed by participants

4.4.2 Concerns – team one

Lecturers in team one were all novices so they had more concerns about the design process.

Fairness in assessment – team one

Fairness in assessment for both distance and face-to-face students was one of the main concerns of lecturers in team one (L1, L2 & L3). The type of assessment they each chose to use differed and depended on their teaching style. For

example, L2 and L3 decided to assess students' discussion and short essays, while L1 required students to write essays and answer short answer questions in his subject. ID1 was quite concerned about L2's and L3's choice of assignment and assessment, and this was her reason:

L2 and L3 haven't used the discussion space before and they need to spend more time in it and I know they haven't. I know it will take their time and I know they don't see it but I'm concerned because they do not realise the workload (ID1, 23 January, 2003).

L1 claimed that he was satisfied with the assessment scheme he used and would be using it again in the next session. He stated that students produced very high quality work compared to individual assignments in the traditional classroom. L2 and L3 admitted that they had to change their assessment schemes, improve them and add a variety of assessed activities for their students.

Extra workload – team one

Lecturers in team one (L1, L2 and L3) stated that online assessment required students to produce high quality work. They were pleased to see what students did. Despite this positive outcome, L1 and L2 stated that there were challenges:

- More upfront energy and effort is required to plan an online subject. More careful thought and preparation has to be done and that will be seen in the quality of materials you design in your subject (L1, December 23, 2002).
- The more assignments students put in the more work I have to do (L2, December 23, 2002).

The downside of using online assessment was that lecturers had two or even three times more assignments to mark than in a traditional classroom, as shown in the second quote (p.135). Despite the extra workload experienced in online learning, out of everyone, L3 chose to repeat the experience again in the next session and both L1 and L2 also were determined than ever to improve their ICT skills and inject more advanced activities into their websites. L2 reported that his experience had helped him to think about designing more creative assignments that will challenge both face-to-face and distance students.

Technical skills – team one

As novices, L1, L2 and L3 were quite concerned about their limited technical skills at the beginning of the design process. The following remarks support this:

I did not know what to expect from the first meeting, I was so worried that I would not understand anything because it might be too technical for me, but the ID was great, she made it sound so easy and I'm sure she will help me along the way (L1, December 23, 2003).

I have no idea about how to use technology to design something more challenging. I really need the ID to help me learn how to use technology in my work and that is why I've agreed to work with her (L3, February 19, 2003).

At the end of the design process L1 and L2 expressed satisfaction with the level of technical assistance they had received. L1 pointed out that individual training was the best option because of the participants' busy schedules. This option gave novice lecturers more confidence in using online learning environments, as indicated:

I am now doing things with technology, which I could not even do 12 months ago. (L1, July 18, 2003).

ID1 was quite concerned about maintaining lecturers' interest and enthusiasm at the beginning of the project. However, it did not take long for her to realise that L1 and L2 were very dedicated and committed and took their role seriously throughout the design process, as ID1 commented:

Occasionally you get academics who just have the time and the headspace to be able to run with you and it's really lovely when that happens and that has been the case. (ID1, August 23, 2003).

Technical training – team one

At the beginning of the process, lecturers in team one were hoping to receive some basic ICT training but as it turned out, their busy work schedule made it impossible for ID1 to provide specific and basic technical training to the lecturers as a group.

Value of the websites – team one

L1 and L2 were very concerned about the quality of resources for their websites during the planning and design stage, so they spent a lot of time and effort refining and revising these resources. Both lecturers only realised the true value and quality of their websites when students began using them. They had no regrets and were satisfied with the content of their websites, as shown in the quote:

Students were deeply engaged in the discussion. Some wrote pages of quality information that would not have emerged in a classroom situation but in this case they were able to continue the discussion in their own time (L2, 25 August, 2003).

Some of them write a lot or put a lot on the discussion site. Some would include valuable information from other articles of interest to them and they'll write pages and a half, others would respond and it becomes quite complicated (L1, 28 August, 2003).

L2 explained that students enrolled in the course were mature working students, like principals and heads of other sections in the Education Department, so lecturers were not sure whether they would have the time to use the chat sessions and the discussion space; they did put in the time to share their ideas. L3 on the other hand, mentioned that she wasn't very comfortable with her website and wished that she had spent a lot more time with the ICT assistant during the design process.

I plan to spend more time with the ID so I could create a better website for my students. This experience has helped me to see the potential of technology and has helped me to assess my IT skills and needs. (L3, 29 August, 2003).

It is important to note that the lecturers' ICT concerns at the beginning turned out to become stepping-stones for them to improve their websites.

Time frame - team one

Lecturers had different views about the time frame set for them to get their work done. L1 and L2 were concerned that they had so much to do within a set timeframe. L1 emphasised the need for the department to provide assistance in photocopy and database search work. He claimed that he would have done a much better job with his subject plan if he had received assistance. L3 regretted having to do her work within the last few days but she said that without the ID's assistance and encouragement she would not have had the confidence to put her subject online. She stated that being a novice and doing last minute work only brings more doubt and confusion. This is why it is important to have a good relationship with an ID who knows the job and will guide you along.

4.2.3 Concerns - team two

Some of the concerns that were discussed in team one do not apply to team two. The concerns of this team were different because of the nature of the tasks, the technical skills of lecturers and the number of members in the group.

Extra workload – team two

L5, who took over from L4 as mentioned earlier, valued his role in managing the website and carried out the training plans outlined by L4. Lecturers mentioned that they preferred individual training because they felt that L5 was able to give them the support they required. ID2 was quite concerned about the work load that L5 was engaged in but she had no doubt that he was capable of managing the website and running the individual training sessions. She commended the enthusiasm of both L4 and L5 and was certain that the website would be a success at the end.

Technical skills – team two

Both L4 and L5 were concerned that lecturers (users) with very little technical skills would be the ones who would be reluctant to use the website. However, it wasn't as concerning as they thought, as some beginners showed interest at the beginning and worked along well. L5 did his best to provide basic technical training but admitted that there were still some lecturers who were novices so it was taking longer than anticipated to help them become confident in using technology in the learning environment.

Value of the websites – team two

L4 was quite concerned that it would take a while for lecturers (users) to contribute, communicate and share their teaching skills and resources with colleagues in the website. Initially, that did happen and only a few showed interest at the beginning but eventually, the lecturers who were slow to adopt the new idea were coached by L5 and were able to contribute and effectively use the website. L5 had expected lecturers to show interest and began using the website as soon as it was introduced however, things turned out differently as shown in his remark.

I'm disappointed that they are not using it the way we originally planned. (L5, July 15, 2003).

Time frame – team two

Time was not a great concern to ID2 and L4 because they were familiar with the process of designing ICT learning environments. L4 said that her main concern was the length of time that it would take to support the users of the website. L5 later pointed out that it took longer to encourage lecturers (users) to use the website. L5 remarked:

We spent time with the lecturers and showed them what was there. I don't think they are looking and seeing the value in it and maybe they are technology wary and I think they haven't spent the time to investigate what value there is in there because a number of them are only using technology because they have to. (L5, July 15, 2003).

Participants in both teams had their own concerns about the contents of the websites, how they would be used and the urgent needs of learning basic ICT skills. Both groups were satisfied by their current work but reported that most of their concerns were resolved while they were still working with others.

Reflection on the design process

All participants were proud of their achievements and claimed that their technical skills and knowledge were improved. L1, L2 and L3 printed their students' work to demonstrate to the researcher that the students enjoyed their websites as much as they themselves did. They all reported that they are now more confident in using ICT in learning, and were already planning ways of improving their websites and were looking forward to engaging the ID to assist them again. Table 4.11 presents a summary of similarities and differences in participants' reflections on the design process.

Characteristics	Similarities	Differences
Technical skills at the beginning	<ul style="list-style-type: none">• All novices had limited ICT skills.• Novices uncertain of their roles.• All lecturers needed assistance from IDs and other ICT	<ul style="list-style-type: none">• L1, L2 and L3 -had limited ICT skills.• L4 – had ICT skills and was an experienced designer of e-Learning environments. She planned the different features of the course website and relied on the ID for advice, support and assistance.

	experts.	
Technical skills at the end	<ul style="list-style-type: none"> Lecturers were content with ICT training and support received. More confident in using ICT. Plan to improve their websites. 	<ul style="list-style-type: none"> ICT knowledge and skills varied. L1, L2, and L4 & L5, were very confident, L3 did not receive much ICT assistance but was content and ready to improve her website.
Experience in managing website	<ul style="list-style-type: none"> Ability to make alterations in websites. 	<ul style="list-style-type: none"> L3 wasn't really confident in managing her website. L1 & L2 were confident that they could manage their own websites. L4 - left team two, L5 was responsible for everything.
Collaboration process	<ul style="list-style-type: none"> Good rapport. Prompt response by IDs. Participants trusted each other, were enthusiastic and motivated to work. 	<ul style="list-style-type: none"> Individuals had different needs. Some met more frequently than others. Some communicated mostly via email, others met face to face.
Roles of participants	<ul style="list-style-type: none"> Individuals carried out their roles. Dedicated and committed. Called for assistance when needed. 	<ul style="list-style-type: none"> L1 had an assistant to search the database. L2 compiled resources by himself. L3 spent less time than L1 & L2. L4 just planned the website and ID did most work. L5 managed website and ran ICT skills courses.
Final outcome	<ul style="list-style-type: none"> Satisfied. More confident to use ICT. Designed high quality work. Contained quality resources. 	<ul style="list-style-type: none"> 3 websites were completed but had different teaching styles and designs. One had the main features and may evolve further over time.
Recommendation on collaborative design	<ul style="list-style-type: none"> IDs are needed in Institutions. Ongoing ICT support, assistance and advice is needed. Lecturers assist each other. 	<ul style="list-style-type: none"> Individual training more effective than group training. Commitment depends on everyone. Aim and design own style of learning activity.

Table 4.11. Participants' reflections.

The characteristics shown in Table 4.11 above are related to the categories discussed in other sections of this chapter. The characteristics will be discussed in chapter 5.

4.2.4 Role of ICT in learning

The question that guided this section was:

- How do lecturers and IDs see the role of ICT in learning?

L1, L2 and L3 described the role of ICT in the online learning environment as important because of its flexible nature, enabling them to reach distance students. They also looked at the potential of ICT to provide quality learning at different

levels, which challenged learners to engage in deeper levels of thinking. L2 discovered from his experience that learners put more effort into their work because they knew that everyone in the class would read their essay or discussion. L1 believed that online learning enabled him to combine different resources, especially readings, and make them available to students. He claimed that the downside of integrating ICT in learning is that it requires a lot of time, effort and dedication. L1 stated that going online means being prepared to receive technical training and being ready to try new pedagogical methods. Online learning does have its advantages and disadvantages, as this quote indicates:

There are upsides and downsides. The upside is that students are encouraged and expected to be engaged with the course on an ongoing basis, reading, commenting and reflecting and so on; the downside is, you are making a lot of stick for your back. (L2, August 18, 2003).

Similarities and differences between the two teams

Participants in both teams were mainly lecturers and IDs but their levels of technical knowledge differed greatly. Table 4.12 presents the experiences encountered by all participants in the two teams.

Lecturers were all qualified but the main differences at the beginning of the design process were in their individual level of technical skills. An important point about novices was clearly explained by L2 in his remark:

One has to be willing to put aside his or her ego and collaborate with the ID and other technical experts (L2, 25 August, 2003).

Feature	Similarities	Differences
Participants	<ul style="list-style-type: none"> • Lecturers were well qualified and experience. • IDs were qualified and had e-Learning experiences. 	<ul style="list-style-type: none"> • L1, L2 and L3 were novices. • L4 & L5 - had experience in using ICT. • ID1 co-ordinated different online projects for the whole university. • ID2 worked for the Education Faculty.
Collaboration	<ul style="list-style-type: none"> • Communication was continuous. • Lecturers depended on IDs a lot more. • IDs were available at all times. • Prompt response by both IDs. • IDs checked & approved individual website plans. • Everyone worked within timeframe. 	<ul style="list-style-type: none"> • ID1 facilitated the design process. • L4 facilitated the design process. • L1, L2 & L3 had different activities on their website, but discussed their ideas with each other and the ID. • L4's approach to training was slightly different from L5's plans.
Roles	<ul style="list-style-type: none"> • Roles were clearly specified. • Lecturers did the planning while IDs worked on the design with 	<ul style="list-style-type: none"> • ID1 provided on going ICT support from the design stage and arrange with another ICT expert to continue supporting them.

Feature	Similarities	Differences
	<ul style="list-style-type: none"> other ICT experts. IDs provided ongoing support and advice to lecturers. 	<ul style="list-style-type: none"> ID2 provided ICT only during the design stage then passed the responsibility to the lecturer. L1 and L3 lecturers received individual ICT training from another ICT expert. L5 received ICT training directly from ID2.
Task	<ul style="list-style-type: none"> All were creating websites. 	<ul style="list-style-type: none"> L1, L2 & L3 worked on individual subject websites. L4 and L5 created a website for one whole course.
Attitude of IDs	<ul style="list-style-type: none"> Trust, encouragement, supportive, ambitious and good rapport. 	<ul style="list-style-type: none"> L3 did not really experience ICT support and as other did. L4 discussed everything with ID2 while L5 called the ID only when needed.
Concerns	<ul style="list-style-type: none"> ICT knowledge and skills. Limited timeframe. Quality websites. Continuous ICT support from ICT experts/ID. 	<ul style="list-style-type: none"> L1, L2 & L3 were more concerned about the timeframe and lack of ICT knowledge & skills. L4 & L5 were concerned about the value of website. ID1 concerned about lecturers co-operating with her. ID2 concerned about training lecturers (users) of the website.
Training	<ul style="list-style-type: none"> IDs were satisfied with the support provided. 	<ul style="list-style-type: none"> L1, L2 & L3 did not receive ICT training from the ID. L4 left technical issues with ID2 to deal with. L5 requested for assistance & support from ID2.
Reflection	<ul style="list-style-type: none"> Communication was good, open and participants trusted & respected each other's expertise. Lecturers were satisfied with the outcome. Availability of IDs and their positive reaction to lecturers encouraged lectures to complete the task. 	<ul style="list-style-type: none"> L1, L2 & L3 resources for the websites, CD and handbook were completed on time. The website features were fixed for the session. ID2 created the main the features (sections/tools) of the website and completed them on time. These features would be altered and revised as lecturers learn other creative ideas and methods of designing the learning activities and resources.

Table 4.12. Similarities & differences

4.5 PARTIV – Analysis of the final design process outcome

4.5.1 Development of website – Team one

As mentioned earlier, L1 and L2 were given a chart (Appendix, p.225) to guide and assist them in the planning process. Lecturers (L1, L2 & L3) reported that the chart was very helpful, but in actual fact, only L1 used it step by step as directed by ID1. L2 only used the resources and teacher interaction sections, and L3 only used the resource section. L2 seemed to be comfortable with technology right at

the beginning, so he only used what was necessary to him. L3 was quite nervous and explained that she could not fully use the chart because of limited time.

L1 admitted that the first group meeting did not really help him to understand the planning of resources for his subject website and that was why he had to use the chart exactly as described by ID1. L1 and L2 were given two weeks to plan their subject websites before meeting ID1 during the second meeting. They both confirmed that things became much clearer during the second meeting and admitted that the more time spent discussing the plan with the ID helped them to understand their roles better. L2 said that Figure 4.2 shows an example of the website created by L1.

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

Figure 4.2. Home Page for L1's subject website.

Figure 4.2, shows the homepage of L1's website. It looks totally different to the plan that he had on the chart, (Appendix, p.225). The changes represent the refining process that occurred during the different stages, from the paper (chart) stage until it was finalised and designed as the website shown above. The

homepage appears very plain, just like any other WebCT websites, and that was done according to ID1's advice. The design process took a while to work on because both the lecturer and the ID had to agree on the activities assigned by the lecturer for the website. The completed website shown in Figure 4.2 and Figure 4.3 shows the combined effort. This website was well used and accepted by students.

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

Figure 4.3. Examples of the assessed assignments, L1's website

Figure 4.3, presents a picture of the discussion page in L1's website. This page shows that students actively participated in the main areas that were assessed. L1 recalled his students' attitude at the beginning of the session and described them as enthusiastic, motivated, hardworking and eager to learn.

4.5.3 Development of website – team two

Figure 3. 3 in Chapter 3 shows the actual diagram drawn by L4 on the whiteboard that outlined her plans for the website. Ideas from this diagram on the whiteboard were then expressed by the ID in the form of a table, (Appendix, p.231) to help her understand the main features of the planned website. The table

drawn by ID2 enabled them both to see things from a different angle which then helped to guide, refine and revise their plans until they completed the website as the shown in Figure 4.4.

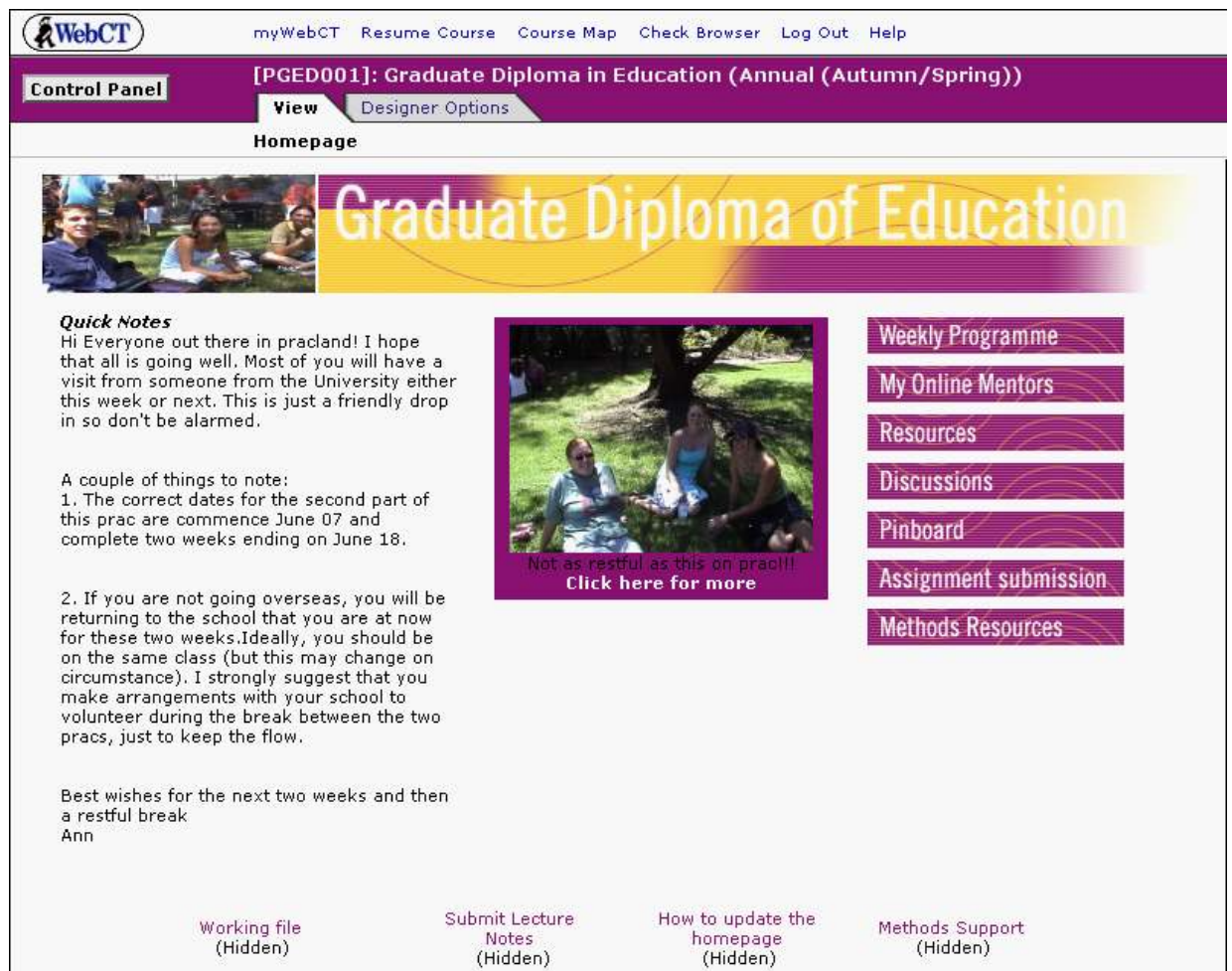


Figure 4.4. Homepage of team two’s website.

L4 said that the constant interaction between ID2 and herself resulted in the design of a very good website which used the WebCT homepage but employed different features. ID2 remarked:

You will notice that the actual website is completely different from the diagram on the whiteboard. A lot of discussion and exchange of ideas took place before the final website was completed. (ID2, July 18, 2003).

Difficulties experienced during the process

The most difficult experience for both teams was when the main university server crashed after four weeks of using the website. The technical team and the IDs were able to retrieve some of the work but unfortunately they lost most of the

activities on their websites. L2 said that the experience taught them to have backup copies of their work, which they did not do in this case. L5 remarked on this:

When the server crashed, we lost some things that we were involved in and therefore those people who actually tried to nibble on it and tried to use it, were sort of set back a little bit. It wasn't WebCT, it was a server problem. (L5, August 29, 2003).

L3 said that she did not know how to begin her work again after the server crashed. She tried her best to be calm and was thankful that the ID helped her continue using the website. This was a different experience for novices but they were persistent and were able to get back on track after consulting with the ID. L1 said that he wished that the problem never occurred but he was thankful that the students were patient and did not seem to mind, and slowly picked up from where they had left and carried on with their assignments. The experience did challenge lecturers technically but as L1 added, they all trusted the ID's to assist them through.

4.6 Summary

The collaboration process between IDs and lecturers assisted the lecturers (especially the novices) to realise the potential of technology and experience the challenge it brings to learning. For example, lecturers' who were novices in using ICT gained the courage to attempt new ideas and explore new pedagogical methods as they worked closely with the ID. L4 was very familiar with online learning, but planning a combined website for a whole course was something new and challenging so collaborating with the ID gave her confidence to pursue her plans. The analysed results indicated that constant communication, respect and trust amongst the participants enabled them to complete their roles successfully. Lecturers learnt new roles of classifying and authenticating all electronic resources especially from the database and the Internet.

CHAPTER FIVE

REVIEW AND CRITIQUE

'Meaningful learning is collaborative and conversational. Technology can be an intellectual partner, a tool and a context.' (Jonassen, 1995)

5.1 Introduction

This chapter begins by reviewing the findings outlined in the previous chapter concerning team collaborative strategies employed by lecturers and IDs, in the two case studies, as they worked together to design online learning environments. The different strategies used by participants in the study are discussed and its implications for Papua New Guinea and particularly at PAU (Pacific Adventist University) where the researcher works. This is followed by suggestions about issues that could be investigated on methods for supporting, training and assisting lecturers in developing countries who are novices in designing e-learning environments. It concludes with a suggested model that was created from the study carried out in a top western university setting that could be used by a university in a developing country, such as Papua New Guinea.

Instructional design is the process through which an educator determines the best teaching methods for specific learners in a specific context, attempting to attain a specific goal. (<http://www.ieee.org/organizations/eab/tutorials/>). The use of ICT in learning is becoming a norm in education in many Western countries and many universities are encouraging teachers/lecturers to integrate ICT into their teaching, not only for new e-Learning programmes, but also as an enhancement to existing campus-based delivery (Anderson, 1999; Slay, 1999; Agostinho et al., 2002). As e-Learning environments are being developed, revised and refined, ICT experts/IDs should indicate to lecturers at an early stage of the design process as to how training and support will be provided to them (Collis, 1997).

Despite the increased use of ICT in learning in Western countries, there are some well- experienced lecturers at the tertiary level who are novices in the design and use of ICT for educational purposes and require basic ICT training from technical

experts to help them use ICT effectively in the e-Learning environment (Mishra et al, 2002; Thompson & Holt, 1996; Kozma, 2000; Barnett, 2003 and Lambert, 2003). This study confirmed that there are novice lecturers in tertiary institutions in developed countries who are computer literate but require training and assistance from IDs and ICT experts to help them use ICT in their teaching.

Developing e-Learning may be a new experience for many lecturers and it is one which demands careful preparation and thus presents a great challenge to the academic culture, especially to the already very busy work schedules for lecturers. Bain (1999), Herrington, et al., (2000), McGriff (2001) and Koppi (2002) claimed that lecturers involved in designing e-Learning resources usually begin at the most basic level and slowly move to more advanced techniques as they gain more courage and confidence. Having IDs and ICT experts work with lecturers does make a lot of difference by gradually changing their attitudes towards using ICT in their teaching.

Most lecturers who are now using e-Learning environments have, at some stage, received assistance, support and guidance from ICT experts and IDs or even from fellow lecturers who are experienced ICT users (Sugar, Crawley & Fine, 2004). Westhorp et al (2000) state that involving lecturers throughout the design process, although at a minimum level, will give them confidence to use ICT in their subjects. In supporting this view, Gunn (2001) and Reeves (1999) found that novice lecturers who work closely with ICT experts and IDs during the design stage usually express satisfaction in using ICT in their teaching. Most of them continue to improve the learning activities and resources in their subjects, which also enables them to improve their design skills and techniques.

Team collaboration opens up an opportunity for lecturers and IDs to share ideas, knowledge and expertise that would enable them to assess their work and have more understanding of their individual needs (Ellis & Phelps, 1999 & Johnson and Johnson, 1994). Shifting from traditional teaching to e-Learning requires a change in staff development culture because the process of developing e-Learning resources requires a collaborative team-based approach between lecturers and IDs (Bennet, Priest & Machperson, 1999; Slay, 1999; Torrissi-Steele and Davis, 2000; Phelps et al, 2000). Novice lecturers need assistance from IDs and other ICT experts when making their first attempt to design e-

Learning environments. Tearle, Dillion and Davis, (1999) emphasise that lecturers can only adopt meaningful learning using ICT if they take the time to work with educational designers who would assist them to re-examine their pedagogical strategies when designing quality learning resources. In the present study, participants (lecturers and IDs) began collaborating together as team members at the beginning of the design process. During this process, IDs assisted lecturers in selecting their instructional materials and assessment tools as well as in the development and delivery mode.

The review will focus on collaboration strategies employed by lecturers and IDs in this study. The study adopted the design process by Edgar (2000) as well as the seven steps of team collaboration guidelines by Johnson and Johnson (1997) as set out in Table 5.1. Column one in that table explains the design process, column two outlines the seven collaboration steps, and column three points out how the steps were used by the participants in this study.

Design Process (Edgar, 2001)	Seven steps of Team Collaboration (Johnson and Johnson, 1987)	Team collaboration steps used in this study.
Planning Stage	1. Defining and structuring the procedures and becoming oriented. 2. Conforming to procedures and getting acquainted.	1. Defining and structuring the procedures and becoming oriented. 2. Conforming to procedures and getting acquainted. 3. Committing to and taking ownership of the goals and other members.
Selection of Design	3. Recognizing mutuality and building trust.	4. Recognizing mutuality and building trust.
Development Stage	4. Rebellling and differentiating 5. Committing to and taking ownership of the goals with other members.	5. Functioning productively.
Evaluation Redesign	6. Functioning productively. 7. Terminating.	6. Support continuos.

Table 5.1. Design and collaboration stages

Participants in both teams followed the four main stages of the design outlined by Edgar (2000) and used only five out of the seven steps of team collaboration guidelines of Johnson and Johnson (1997). The two steps that were not used were step 4 (rebellling and differentiating) and step 7 (terminating). Participants were professionals who collaborated and respected each other's views and ideas throughout the design process. They did have different views on certain pedagogical concepts but managed to sort these out during group meetings. The

group collaboration process ended after all e-Learning environments were designed but individual lecturers still requested ICT support from the IDs and ICT experts. The collaboration process never ended (terminated); it continued to grow but at a different level.

During this study the team collaboration guidelines did not occur in the order outlined in column two. Most of the team collaboration guidelines (steps) were introduced together at the beginning of the design process. Lecturers accepted the procedures at the beginning of the project and were committed to their roles as they took ownership of the design process from the commencement of the study until the completion of the individual projects.

The review of the results is organised around the following sub-topics.

- Strategies used in the planning and design process
- Roles of Participants
- Concerns experienced during the design process
- Impact of the design process on participants
- Summary

Issues of planning and design are prevalent in educational institutions today. Most lecturers and ICT experts are developing their own e-Learning environments to help them experience the values and benefits of ICT and the problems associated with it. Hedberg (2002) warned that the most important factors that require critical consideration when planning, designing and implementing an e-Learning environment are the learning styles, attitudes of lecturers and learners towards ICT, online interaction and communication and using appropriate technology. Keppell (2003) claimed that the design and development of e-Learning environments ‘...requires a team with a diverse range of skills and talents to successfully complete all aspects of a module.’ The planning process which occurred in this study engaged ICT experts and professional lecturers.

5.2 Strategies used in the planning and design process.

The findings from this study demonstrate that the design of an e-Learning environment requires a team of ICT experts, IDs and lecturers working together

to create effective e-Learning resources. Belbin (2000) describes team collaboration as a situation where participants work together to promote change in an organization or in the learning environment. This team collaboration process is vital for people involved in designing e-Learning environments because they need each other's expertise in the process. For example, Keppell (1997) asserted that IDs are experts in their own field, but often it is not easy for them to design e-Learning environments for subjects which they are not familiar with. When introducing e-Learning to novice lecturers it is important for them to consult and work with lecturers (Subject Matter Experts) who are familiar with the subject content. It is important for the IDs/educational designers/ICT experts to explain their role clearly and outline the type of support and assistance they would provide during the design process.

Some lecturers are wary of technology so the process of collaborating with different ICT experts will encourage lecturers to work and learn from them. Kiser (1999) stated that despite everything that ICT can do, people still need to collaborate during the design process. His research focused on a group of employees of Sun Microsystems, who were engaged in a self-paced course of online instruction. The result demonstrated that, when the employees worked on their own, only 25 percent managed to complete the course, while numbers increased to 75 percent when a tutor became available. Charps (2002) further supported this view, suggesting that interaction is imperative among users of ICT as most users will only be successful if they collaborate with each other. Team collaboration consists of different interactions through group and individual meetings that develop clear communication, planning and design strategies. The success or failure of the team depends on how each of these strategies is used during the design process.

5.2.1 Meeting strategies

At the commencement of the study both IDs initiated group meetings where members of their individual group met and outlined plans for their specific online subject. The meeting strategies employed by the two IDs were different, due to the nature of each project, the level of ICT knowledge of lecturers and the size and structure of their group. Both IDs took the opportunity, during the first meeting, to assess the level of ICT knowledge and skills of lecturers and respond

to their queries, questions, requests and problems. The research of Sims and Jones (2002), suggested that IDs and ICT experts have a lot of influence on lecturers during the design process therefore it is important for both parties (lecturers & IDs) to understand each other's views, ideas, plans and values at the beginning of the project, before engaging themselves in the design process.

Group meetings were the most suitable method for members to communicate with each other and encouraged them to express their respective views, and to receive suggestions and professional assistance from ICT experts as well as from colleagues (subject experts). Because they did not have the basic technological skills and knowledge, lecturers in team one were uncertain during the first meeting as to whether they would be able to cope with the technological and pedagogical ideas. Barnett's (2003), writing supported the view that novice lecturers would have uncertainties in the design process, so that IDs and ICT experts need to understand the lecturers' individual abilities and work at their own level. Palloff and Pratt (1999) supported this view and claimed that training and supporting novice lecturers to use technology might also be a challenge for technical experts (IDs), especially if they are new to the field of study. Keppell (1997) summarised this by claiming effective online learning environments can be designed when IDs and lecturers (SMEs) collaborate together by sharing their expertise. In this study the first impression of lecturers concerning both IDs during their first meeting were very positive because of their attitude and openness in explaining how support and assistance would be provided.

Meeting strategies: case one

The first case group meeting provided an opportunity for ID1 to clarify individual roles and outline the structure of the design process. Lecturers in team one were all novices in using ICT in learning so the first meeting covered basic ICT information where the ID demonstrated different ideas that could be used in the e-Learning environment. Lecturers listened with interest while trying to understand the online design concepts presented to them. They were very observant and willing to express their views and ideas on their various design preferences. Their willingness to attempt new technological ideas, as well as the continuous support received from the ID and the ICT expert, had a positive impact in assisting them to appreciate the values of ICT in the learning

environment. Designing successful e-Learning environments would only occur when team members have a close relationship with each other (Quick, 1992; Johnson and Johnson, 1997 & Dyer, 1987). This study demonstrates that group and individual meetings played a very important role in the design process, because participants were able to share and discuss their ideas, skills, plans, knowledge and even problems with their colleagues and the ICT experts.

The formal meetings gave an opportunity for the IDs to address and reflect on the different values, problems and issues as experienced by lecturers during the design process. Reigeluth (1999, p.3) noted that:

...teachers are a unique type of clientele for Instructional Designers... they create and deliver resources and instructions and they own their subjects in a face-to-face setting, but when changing from the pedagogical delivery methods to suit the online learning environment, they need IDs to provide the necessary IT support and assistance.

Also, research by Liu, Gibby, Quiros and Demps (2002) claimed that, although IDs are experts in creating e-Learning environments, they need to communicate well with lecturers who are experts in their individual subject. Before actually demonstrating samples of different design styles and structures used in the online learning environment, the ID in team one explained her role clearly in outlining the type of ICT support she would provide to lecturers during the first meeting. Additionally she answered questions from lecturers, had brief discussions in some areas of e-Learning, but emphasised the importance of cooperation and collaboration amongst all the members, stating that she thought that.

‘L1’s involvement as a coordinator of that program has been for me particularly satisfying because it just provides some leadership and direction and cohesion. And you know if L1 says at the end of the day, well, we are all going to do this then most likely it will happen and everyone will just collaborate which is great.’
(ID1, 19 February, 2003).

Collaboration does have a positive impact on participants by increasing their motivation and helps them to stay focused.

Scheduling a specific date for the first group meeting proved to be difficult for the ID in team one because there were more members in that group. Scheduling formal group meetings required patience, understanding and co-operation of each member in the team. The first group meeting had a positive impact on the

lecturers in team one, when they realised that the ID would be available to provide ICT support during the design process. Lambert (2003) and Quick (1992) asserted that outlining specific guidelines in the design process on how support would be provided encourages lecturers to collaborate with other team members as they carry out their respective assigned roles. Having an ID available to support lecturers/educators in the design process will encourage them to use ICT in their work, (King, et al, 2000).

That study showed that in this context regular group and individual meetings encouraged lecturers to collaborate more with the IDs and ICT experts. Group meetings often went beyond the schedule time, but none of the lecturers complained nor left the meeting room. Often there were pre-meeting discussions where members of the team meet with one another or exchange memos or phone calls before a schedule meeting. Members (both lecturers & ID1) in this study were engaged in pre-meetings before attending scheduled meetings. Frequent meetings with the ID provided the opportunity of brain storming ideas and selecting suitable ones that were later included into their design plans. The discussions from the meeting did not cease at the end of each formal meeting but continued amongst the members, which was an opportunity for them to share their ideas and skills. Both formal and informal meetings held among lecturers or between individual lecturers and the ID/ICT expert assisted lecturers to incorporate appropriate learning activities in their e-Learning environments.

Meeting strategies: case two

The lecturer in team two was in charge of all the meetings, outlining her plans for the course website and leading the discussion. An experienced online subject designer, she still depended on the ID to assist her design the course website. She initiated meeting schedules which were held in the ID's office. Discussions were focused on the features drawn on the chart (Figure 3.4). Both the ID and the lecturer were very comfortable with the plan because they both had ICT skills, knowledge and experience in using ICT in the learning environment.

In team two only two formal group meetings were held between the ID and the lecturer, each meeting lasting for about two hours. Discussions were mainly about the features and the structure of the course website. They also had regular *ad hoc* meetings, and often these occurred during coffee breaks. When the course

website project was completed they held three formal group meetings with the users of the course website. Users were lecturers who were responsible for teaching different subjects within the course. It was obvious during the first group meeting that most users (lecturers) were novices, so the ID took the opportunity to show and illustrate some basic ICT skills to the users. Most users felt that they could not master the skills, so they decided *not* to use the course website. The users (lecturers) requested individual ICT support to assist them master the new skills before they could use the course website, so the ID began working with them individually or in small groups of two.

Lessons learned – meeting strategies

Instructional designers and ICT experts should develop a plan on how to prepare lecturers, especially novices in their own institutions to appreciate the value of ICT in enhancing learning. This helped them to see the purpose of their efforts. IDs and ICT experts should always prepare their teaching resources well in advance before meeting lecturers. For example, they should:

- select appropriate samples according to the level of learning taught by the lecturers;
- explain the agenda of the meeting right at the beginning to assist lecturers understand what will be discussed;
- encourage questions during the meeting and generate discussions so that lecturers can express their ideas, opinions and views;
- where possible involve other experienced IDs/ICT experts in the design process; King et al (2000), claimed that an ID with a lot of experience would know how to approach novice lecturers as well as experts in using ICT for learning;
- ask lecturers to reflect on the whole process and suggest probable improvements.

The ID or the lecturer in charge of the design process should respond promptly to queries and questions raised by members in the team. Distributing a summary of each formal group meeting via email or on paper reminds lecturers about what needs to be done, and that the ID understands their needs and will assist them to complete the work. Liu, Gibby, Quiros and Demps (2000, p.2) supported this view and stated that ‘...instructional designers must understand the needs and

desires of their clients, the objective and the audience of the finished project...’, understanding the capabilities of novice lecturers can be challenging so it is easier for IDs to demonstrate various ideas and examples from other clients.

Whether in groups or one-on-one basis, formal meetings were conducted in a professional manner. Meetings also provided an opportunity for the IDs to assist participants analyse and identify their strengths, weaknesses and needs. Knowles, Kunz and Tarnowska (2003) claimed that lecturers would be able to identify their strengths and weaknesses in using technology when they work closely with technical people.

Lecturers in this study stated that the IDs were friendly, supportive and were attentive to each individual lecturer’s comments, suggestions, concepts, plans and perspectives.

The ID was always available to answer my queries and questions. I was able to carry out my plans and I had no doubt that she would help me out. (L2, 23 December, 2002).

This study showed that in this context lecturers who collaborated well with the ID and the ICT experts during the design process were satisfied with the final design of their e-Learning environments and decided to continue amending and improving their subject websites. The only lecturer who did not have a close relationship with the ID was not satisfied with her subject website. Because of overseas commitments she had missed all the opportunities for discussing her design problems with the ID.

I would have designed more activities for my students if only I had the time to discuss with the ID. (L3, 22 December, 2002).

Meetings between IDs and lecturers involved training, sharing and discussing important issues related to ICT and the design process. During the meetings lecturers received assistance in several ways such as coaching, demonstrations, direct guidance and shared reflections.

The design meetings were scheduled to suit lecturers’ timetables. Team one’s experience showed that having an active and enthusiastic group co-ordinator or group leader would keep members on track by encouraging them to attend meetings and carry out their roles assigned by the ID. Novice lecturers would be

quite nervous at the entry point of e-Learning design projects, but when they understood their roles here they were likely to follow the leader's instruction and take the opportunity to experience the benefits and challenges of using ICT for learning.

It is important that the ID respect and have good rapport with lecturers.

Experienced ICT users often know what they want to do but it is important for them to explain specific plans clearly so that the ID and the ICT experts can understand what they want and make suggestions to achieve this. Collaboration can only happen if members of the team understand each other.

5.2.2 Communication strategies

In any group open and free communication from the top down and vice versa is the secret of reaching a successful outcome of any task or project carried out by a team (Burgoon, Heston & McCroskey, 1974; Belbin, 1998). The ID as well as the group co-ordinator passed on all information via email to all members including L3 who was overseas on other work commitments. Communication can become complicated when dealing with different people in a team (Seaman, 1981) therefore it is important for leaders to communicate regularly and iron out at an early stage any misunderstandings amongst members of the team (Johnson & Johnson, 1997). Members of team one had a goal which was to create quality resources for learning in their individual online learning environments. The ID emphasised that each online subject would be different, and this explanation set a non-competitive environment, which encouraged novice lecturers to openly discuss their plans, problems and concerns. Johnson and Johnson (1997) claimed that rebelling and differentiating is experienced during team collaboration. This study revealed that teams could avoid rebellious feelings when members understand the goals of the project, their individual responsibility and openly communicate with each other.

Communication flowed smoothly and effectively among members in team one because lecturers received assurance that support and guidance would be provided and that their designs would embody their own style of teaching. Lecturers and the ID communicated via email, telephone, and even met face-to-face during group and one-on-one meetings. Lecturers admitted that receiving prompt responses from the ID to their questions and queries enabled them to

work on and complete their e-Learning environments. Constant verbal encouragement and support from the ID helped the lecturers to believe in themselves:

I often felt that my plans and ideas were silly but ID2 would always see the positive side of my ideas and show me how it can be used in my subject. (L2, 23 December, 2002).

Having ID1 who had the IT skills and had the time to talk with me was just great. (L1, 23 December, 2003).

Both IDs' prompt responses to individual lecturers had many positive effects:

- indicating the ID's interest in assisting, training and supporting them;
- expressing optimism about their work progress and a successful ending;
- showing willingness to try the variety of technology that was available in the learning environment.

Communication strategies: case one

Lecturers in team one were novices and had negative attitudes about e-Learning and shifting from traditional teaching to an e-Learning environment. The works of Copper and Burford (2000), Salter and Hansen (2001), Gruba (2001) and Scribbins (2002), support this finding since they claim that novice lecturers are reluctant to adopt ICT in their work because they lack the knowledge and skills and are unsure whether they would be able to handle the new skills in the learning environment.

Both the ID and the ICT expert in this study were able to convince the lecturers by displaying the outline design of different subjects currently running in the university. These were designed collaboratively by other novice lecturers under their guidance. Lecturers then slowly developed confidence and began expressing their views and opinions to the ID and the ICT expert. L3 did not have such communication opportunities as the others due to other work-related commitments and at the end she was dissatisfied with her work. The ID had an open dialogue with L1 and L2 and took every opportunity to share advice, make suggestions and discuss their individual plans. Team members used different mediums to communicate, such as the telephone and email. They also met face-to-face. The form of communication used was selected according to the urgency

of the job, however, the ID promptly responded to the communication medium used to contact her.

Communication strategies – case two

Team two had only two members so communication was easy, however, this does not indicate that communication would always be easy for teams with fewer members. Communication will only flow smoothly when members are committed to the task in hand, that they understand their roles, and share the same interest and goal of creating an effective and quality e-Learning environment (Muffoletto, 2002; Price and Schlag, 2002). Both participants in team two invested their time and effort in discussing and planning the course website. The face-to-face contact became quite important to them and they hardly used the phone or email because their offices were close to each other as emphasised by L4.

I knew the project would be successful because ID2 showed interest right at the beginning and kept updating me about the progress of each section whenever we met (L4, 23 December, 2002).

The secret of their success appeared to be associated with the mutual respect for each other's position, skills and specialties, and they were willing to discuss their differences in ideas and opinions and then compromise where possible.

Lessons learned – communication strategies

As Goodall (1990) explained: misunderstanding and lack of communication can lead to problems or end relationships between workers. However, in this study lecturers were given the opportunity to express their views, feelings, ideas and plans with other members, which appeared to motivate them to learn more and work harder. Kell and Corts (1980, p.6) stated that '...communication in small groups does not just happen; it develops.' Participants (IDs and lecturers) in this study were willing to listen and openly communicate with their team members during group and individual meetings. The open communication strategy should indicate that lecturers understood their roles and were willing to collaborate with the IDs and ICT experts. Regular discussions held between participants enabled lecturers to share ideas and improve their individual online learning environment. As Dyer (1987, p.60) explained, successful groups are those whose members '...communicate effectively and are committed in carrying out their roles.'

Both IDs tried to limit the scope of the designs so that lecturers could do their best within the limited time available. Beebe and Masterson (1994, p. 170) added that members working in groups should ‘...not try to tackle a complex problem unless the group has the time and resources to solve it.’ To save time for members in both teams, the design plans in this study that required programming were directed to programmers and other ICT experts. Complicated designs were passed onto the appropriate experts to help work them out. To achieve a successful outcome in a design process, consulting other experts and experienced people for support and advice is vital.

In this study the ID expressed the view that discussing new ideas with novice lecturers is not always easy because, often, they will feel that they lack the time (Mishra et al, 2002), so that they will tend to leave the work till the last minute. Some may state that their workload is high (McNaught et al, 2000; Scribbins 2002) and thus dodge the idea of using ICT in learning. Palloff and Pratt (2000) claimed that their research showed that introducing e-Learning (ICT) requires IDs to run basic ICT workshops which will create discussion opportunities for lecturers to express their needs and problems in adopting ICT. The strategies of open communication used in the current study were:

- IDs making positive and constructive comments;
- IDs responding promptly to requests, queries etc;
- Participants’ willingness to share individual design plans and problems with others;
- Lecturers accepting suggestions from colleagues and IDs and trying them out;
- ID1s treating lecturers equally.

Both IDs were patient with lecturers. For example, ID1 was very patient and did her best to communicate and support L3 who only became available towards the end of the project. On the other hand ID2 took time to explain the course website to users (lecturers), but most of them did not embrace the opportunity to use it at the beginning because they lacked ICT skills and knowledge. The work of Collis and Nikolova (1998) also showed that lecturers who feel that their needs are not met, or that they lack the required skills, will resist change.

In this case the lecturers in team one felt that the ID should have conducted basic ICT training before engaging them in the design process. However, the ID had time restrictions due to other commitments. Lecturers then went out of their way to acquire specific skills and assistance from another ICT expert which demonstrated that they understood their weaknesses and were motivated to learn new skills and apply them in their subjects.

Each design situation is different, but IDs and ICT experts can make a lot of difference by openly discussing the various ICT options with lecturers while answering their questions and shaping their ideas.

IDs and ICT experts are responsible for the smooth running of the design process. Their actions and management style during the first meeting will have either a positive or negative impact on lecturers' choice to collaborate in the project. Secondly, to express their views, ideas and problems before involving them in the design process, more time should be allocated to lecturers, especially if they are novices. Support should be provided individually as well as collectively in sharing from the beginning, and group discussions should be encouraged so participants can share their ideas and learn from each other. IDs and ICT experts should provide ongoing ICT support and be available to discuss lecturers' queries, problems and ideas as soon as they are aware of them.

5.2.4 Planning and design strategies

A number of studies such as Collis (1996), Keppell (1999), McNaught (2001) and Agostinho (2002) have shown different methods that were used in planning and designing e-Learning environments. This study describes the planning strategies used by participants in the two cases, where IDs collaborated with lecturers in planning and designing their individual e-Learning environments.

Planning and design strategies – case one

The ID in team one gave each lecturer a chart to assist them plot in their ideas as they planned the resources in their subject. Only one lecturer filled in the chart, while the other two used it as a guide to assist them in their planning. It appeared that novice lecturers were not willing to attempt a complex arrangement at this stage but would mostly use other examples and ideas presented to them. A reason for this could be lack of confidence. The IDs were well prepared before the first

meeting, and had chosen to select appropriate and simple design styles that would suit the level of learning used by the lecturers in the team. Most likely, the reason for this is that lecturers only gain confidence to include more advanced and challenging activities if they enjoy their first design experience (Torrissi-Steele & Davis, 2000).

L4 had some ideas on what she wanted and I showed her the example of the previous sites that I've been setting up (ID2, 19 February, 2003).

I have to decide on how I would teach the group, I know their backgrounds so I have to prepare appropriate examples that will provide useful ideas on how they can use technology in their individual subjects (ID1, 22 August, 2002).

However, novice lecturers have to overcome the first hurdle by actually designing the structure of their own online learning environment. Such experience will enable them to assess their individual ICT needs and seek assistance from IDs and ICT experts.

Planning and design strategies: Case two

The lecturer in team two was an experienced ICT user, but she also began the planning process by drawing and illustrating her plans in the form of a diagram on the whiteboard (Figure 3.3). The lecturer was experienced in using ICT in learning, so this reduced the cognitive load of planning on the part of the ID. The diagram became the point of discussion that guided the ID to design the course website. The ID drew a diagram on the computer (Appendix, p.226) to represent how she understood the information on the whiteboard while including additional ideas on what she thought should be done. Despite the different planning approaches used by the ID and L4, the diagram was still the main instrument used in guiding the plans. Keppell (1997) reported that representing ideas visually helps the technical team to understand what the lecturer actually requires and that this makes it easier for them to figure out how to turn these ideas into design features of the e-Learning environment. The lecturer (L4) was aware that lecturers using this website were novices, so they tried to have a simple e-Learning structure so that teachers would see its value and so be motivated to add their individual subjects onto the course website.

Lessons Learned – Planning strategies

The planning process was very similar in both teams as they began using charts and diagrams to illustrate their ideas. The experienced lecturer planned the site in detail but depended on the ID for advice and suggestions, which enabled her to alter and enhance the features of her planned course website. Results indicated that lecturers, whether novices or experienced in using ICT, require assistance from an ID or from similar technical experts to advise and guide them during the design process.

The design experience was quite a challenge for all lecturers in the study. They also had many concerns. For instance, they were concerned that the users may not really use their individual websites and other learning resources (handbook & CD-ROM for team one users) they were designing. The novices identified their roles at the beginning and were quite satisfied that the ID gave them the opportunity to plan their own subjects, but the constraining challenge was the limited time allocated to complete the subject websites. They also felt that the planning process was demanding, because they had to learn basic ICT skills and that most of them realised that attending the basic ICT skills courses in CEDIR (Centre of Educational Development and Interactive Resources) would have prepared them with the necessary technology skills needed to handle their individual websites. A further challenge for novices was to alter their pedagogical methods to suit the e-Learning environments and the study demonstrates this was not an easy step to take. However, with constant assistance from the ID the lecturers managed to complete the share of work expected from them. The experience was a great challenge, especially for novices, but the ID was supportive and guided them in each stage of the design process.

Both IDs engaged the lecturers right at the beginning, thus enabling them to take full responsibility for planning and designing of appropriate learning resources for the learners. Lecturers who were novices realised after a few weeks of consulting with the ID and another ICT expert, that learning basic ICT skills would be more meaningful if they were to plan their work on paper before inviting the expert to check their plans, before being shown how to use the software to design and implement their plans. This method provided an opportunity for IDs and ICT experts to discuss and explore the different design options lecturers could use in an online learning environment. Some lecturers called on the ID for assistance more than others. This depended on how they

understood their roles and the type of design strategies they were using in their subject websites.

Finger and Torrisi-Steele (2000) explained that planning and designing e-Learning environments requires people who are committed and have the time to collaborate with ICT experts. Producing effective and high quality learning resources takes a lot of time and effort (Collis, 1997; Newton & Newton, 2001; Sherry & Gibson, 2002). Many e-Learning environments have merely duplicated lecture notes from a traditional classroom situation and posted them online for learners (Hedberg, 1989; Sims, Dobb & Hand, 2002) but the trend and quality of using ICT for education purposes has improved and many studies (Sherry et al, 2001; Salpeter, 2003; Sharp, Conole & Beharrel, 2001), illustrate that online learning is more effective when the learner is challenged to be in control of their learning. As demonstrated in this study, most lecturers were coached, supported, and guided throughout the design process. Both IDs were committed to assisting lecturers learn the basic ICT skills which would enable them to create simple but challenging and effective activities for the learners.

Group discussions between lecturers and the ID and between lecturers themselves created more opportunities for lecturers to see different ways of creating rich learning environments for students. Creating an effective e-Learning environment for learners across geographical areas requires team collaboration between experienced lecturers and IDs/ICT experts. Quitadamo and Brown (2001), claimed that having interdisciplinary experts collaborating is an important means of creating quality and effective authentic activities that would improve academic and vocational education.

Charts and diagrams are the most appropriate instruments for novice lecturers to use in the planning process. The ID needs to prepare suitable samples for lecturers because the novices mainly follow the demonstrated ideas and structures. IDs and ICT experts exert a lot of influence on lecturers. For instance, lecturer novices in team one selected the activities from the ID's sample list because that was the first illustration shown to them. Lecturers would be committed when they realise that the ID and the ICT expert are available to support them in the design process. An open communication policy should be

put in place at the beginning of the process so lecturers will be comfortable to work with the ID or the ICT experts.

5.3 Roles of participants

The lecturers and IDs involved in this study were professionally qualified and experienced in their own field. Each of them was expected to contribute according to their expertise in the design process.

5.3.1 Instructional Designers Roles

According to King, et al, (2000), IDs are well equipped with ICT skills and knowledge. McGriff (2001, p.312) described the ID as someone who is a professional and qualified to handle the dynamic nature of change in educational technology and its implication for the learning and teaching process. He further stated that the role of an ID is

...to provide training in skills that are essential for teaching and learning with technology, to provide support during the instructional development process, and to offer pedagogically sound guidance for the effective integration of media and information technologies.

Both IDs in this study supported, guided and advised lecturers on the best way to present their learning activities. They were involved in guiding lecturers to plan learning activities that would use a variety of strategies to create activities for the learners.

McGriff (2001) explained that IDs are key people in transforming learning at higher education level. Both IDs were able to identify problems that might affect the lecturers and hinder the design process such as:

- lecturers' lacked the skills to plan challenging activities for students;
- lecturers had limited ICT skills and knowledge;
- they were unsure whether or not their e-Learning environments would be successful;
- they experienced difficulty subsuming additional work into an already busy schedule.

Role of the ID: case one

To assist the lecturers (especially novices) overcome each problem, the ID spent time during group meetings to show examples, demonstrate different ideas and go through each lecturer's planned activities making suggestions or emphasising the potential of the activities they selected. This had a positive influence on lecturers and encouraged them to improve their work as shown in L1's remark:

I was worried that my ideas were useless and will not be suitable in an online environment, I was very concerned about my ideas, but ID1 pointed out how important it was and showed me the positive side to it (L1, 23 December, 2002)

In team one very basic training sessions were conducted for lecturers by the ICT expert. The ID clearly explained to them that due to her busy program, she was not in a position to conduct a full training program. Instead she directed them to attend the basic ICT course offered at CEDIR. Lecturers had a tight work schedule so they made special arrangement with another ICT expert to provide the training in their respective offices when required. The lecturers in this study had a goal, and that was to successfully design their individual e-Learning environments. They were determined to improve their e-Learning resources and use them during the following semester.

Role of the ID: case two

The ID in team two described her role as the technical supporter and designer of e-Learning environments for lecturers within the faculty, so this project was no different. She designed the course website according to the lecturer's plan. On two occasions she took the time to provide specific ICT training (in Web Page construction) to the lecturer responsible for the development of the course website and to the course co-ordinator who would be called upon to maintain the website. After the course website was launched, she volunteered to provide basic ICT training to individual users (lecturers only) needing assistance. Having an ID within a faculty, or especially assigned to assist lecturers in planning and designing their e-Learning environments, is very important. Lecturers who are experienced ICT users still require assistance from the ID. ID2's approach to basic ICT training was slightly different; she allocated time to conduct training to the individual lecturers (users) of the website. Training was provided according to the individual lecturer's needs.

Lessons learned – Role of IDs

The results reveal that both IDs were keen to equip lecturers with basic ICT skills needed for success. They ensured that lecturers received the necessary ICT training, whether from them or other sources that would assist them to manage their e-Learning environments. Providing technical training enabled lecturers to see the potential of ICT in learning and as a result some of them began amending the learning activities in the e-Learning environments while others sought support from ICT experts to improve their skills. A successful ID is someone who is able to lead a team of lecturers, and work with other designers and ICT experts such as programmers, web designers, artists, and video/audio specialists (McGriff, 2001). From this study we can see that an ID needs to have skills such as project management and facilitating skills that will complement their ICT skills. Sherry and Gibson, (2002) claim that the main role of the ID is to assist lecturers to move forward by utilising ICT in their own subjects, and this study supports this view.

Role of lecturers

The online learning environment has been described as a place to enhance a lecturer's lessons and as a place where the lecturer's role is changed from directing learners to guiding and facilitating learning. The lecturers in this study understood their roles and were challenged to engage in higher level cognition as they planned the learning resources. Lecturers who are successful in using ICT in learning are those who express their own personality in a meaningful way, with the assistance of an ID or ICT expert in the e-Learning environment (Bennett, Priest & Macpherson, 1999; Kenny, 2004). Further, LeCornu and Ahern (2001) assert that teachers are the ones who ultimately translate the plans into practical activities for students and they need ICT support to facilitate the changes.

From his own experience, Barnett (2003) emphasised that teachers are not negative towards change but they *are* negative about the lack of ICT support for change. He specifically pointed out that support should be continuous and better resources should be provided, and that there should be open communication between the lecturers and ICT experts. Crawford (2002) identified three basic ways of providing ICT support to lecturers:

- run basic workshops;
- run more advanced workshops according to lecturers' needs;

- provide individual support to assist lecturers and along with that, have online support notes, tutorials and an expert available to assist.

Due to limited time allocated to prepare and design the e-Learning environments, participants in this study had limited opportunity.

The lecturers in this study showed that co-operating with IDs/ICT experts is the key factor influencing the design of effective student centred e-Learning environments. As Liu, Gibby, Quiros and Demps (2002) explain, lecturers do not necessarily have to be experts in using ICT because they can learn on the job, or during the design process. They have to be prepared to take up the challenge of learning new tools while keeping up with rapid changes in technology. All lecturers in the study were prepared to participate actively and to commit their time and effort towards designing quality learning environments. The novices were uncertain on what they would do at the beginning, but as their roles were clarified during the first group meeting they began working on the resources for their subjects and called on the ID and ICT experts to support, assist and guide them through the process. This suggests that group collaboration is dynamic, and that the need for supporting positive interactions among members becomes very important during the design process (Johnson & Johnson, 1997).

Participating lecturers in the study organised the learning resources according to their style of teaching, which was demonstrated on the charts and diagrams that guided their plans. Reigeluth (1999) claims that teachers (lecturers) are challenged to create a wide variety of materials in supporting their instructional activities. Some would often use pre-constructed instructional products to deliver their subjects. However in the two cases under review, lecturers in this study were deterred from using pre-constructed instructional products so they had to plan and organise learning activities of their own, which made them depend more on the ID and ICT experts.

Role of lecturers: case one

The lecturers' main role was to plan their resources and activities for their particular e-Learning subject. Liu, Gibby, Quiros and Demps (2002) state that lecturers who are novices in using ICT often face the challenge of learning about technology while getting involved in planning and organising learning resources.

In team one lecturers were all novices, but commented that they learned many new skills and gained experience through the process. Their experience in planning an online subject was described as challenging. Lecturers were all experienced in their individual fields and were used to planning activities for a face-to-face classroom, so changing from their conventional pedagogical approach required them to think deeper and create more learner-centred activities. Skills developed during the design process were limited to some extent, yet the interest of lecturers in using ICT remained high throughout the design process.

Lecturers realised that the planning and design process requires quite a lot of thought and commitment and that they had to meet the ID as often as possible to get assistance and advice on how to arrange and design their online learning environments. Although novice lecturers knew that the activities they were planning for their online subjects would probably double their workload, they were prepared to experience the challenge. As mentioned by L3:

In a face-to-face class I would only mark 20 assignments but in this case, because of the requirement set out in the discussion section, I will have to mark another 60 assignments. (L3, 24 December, 2002).

Lecturers commented that their roles were mainly to plan activities for their subjects and acquire ICT skills to equip them to use the e-Learning environments they were designing with the assistance of the ID and ICT expert. From the final product, lecturers were able to evaluate their individual design and skills, then begin planning new technological features and more challenging learning activities which would be embedded into their e-Learning environments. Planning to improve their e-Learning environments for the next stage indicates that they learnt from the experience and were now more comfortable and confident in using ICT in the learning environment.

Role of lecturer: case two

The lecturer in team two was in charge of the planning and design process. She led the discussions, and could accept and reject the IDs suggestions before they were incorporated into the course website. She had the technical skills and knowledge but still needed the ID to discuss her design plans for the course website.

There were two types of users for the course website:

1. internal lecturers were those teaching within the university;
2. external lecturers, who were teachers in primary and secondary schools but were engaged in teaching some of the subjects within the course at the university.

Designing the course website was the easy part, but training the users to see the value in it and to actually use it to share resources, ideas and the work covered in their individual subjects required training on the part of L5. As mentioned earlier, group training was unsuitable in this case due to the lecturers' work commitment so individual training was the only option to help provide the necessary ICT skills to individual users.

The lecturer (L5) depended on the ID for technical advice, even though she was very experienced in using ICT in the e-Learning environment. This implies that designing effective and quality online learning environment requires experts (subject experts and an ICT experts) to collaborate together in the design process. The training process was ongoing.

L4, who initiated the project, left due to other commitments so L5 took over the role and continued the training process. L5 commented that individual training was time-consuming but that was the best way to encourage and provide support to lecturers. Users (lecturers) lacked the confidence to use the course website at the beginning of the project but this developed over time. Reushle and Dorman (1999) supported this view, claiming that academics required a lot of training and support in ICT to assist them use it in their work. It took a while to assist lecturers in team two but by the end of the teaching session they were contributing resources and uploading their subject activities onto the website.

Lessons learned – roles of participants

The close relationship between the IDs and the lecturers increased lecturers' confidence and helped them to improve their abilities to plan and organise activities for e-Learning environments. Lecturers are experts in their own fields but some would be reluctant to use new ideas as they feel they might not be able to handle new skills and pedagogy (Salter & Hansen, 2001). On the other hand as Alexander and McKenzie (1998) assert, facilities and resources may be available but lecturers would still resist change. Therefore, ICT experts and IDs need to

guide and actually work with lecturers as they learn to adopt and use ICT in the learning environment.

Users of the course website in team two stated that group training was not very helpful because only those who were experienced in using technology became immersed in the process and participated well. Some novices within the team attempted to use the course website, while others showed interest at the beginning then remained silent throughout the semester. They indicated that learning and using ICT would not be easy for them and that is where the ID has to work individually with them.

In team two both Lecturers (L4 and L5) had good rapport with the ID and the only problem L5 had was in spending enough time with the users of the course website who required a degree of support, advice and guidance. This experience in the study shows that novice lecturers in any tertiary institution would benefit by attending some ICT training courses before working with the IDs and ICT experts.

Appropriate measures should be taken such as allocating enough time for lecturers to practise these new skills, having tutors, ICT experts and an ID to guide and support them. Encouraging lecturers' participation in a technology based learning environment requires good co-ordination and co-operation amongst different experts in an institution; such as subject co-ordinators, policy makers, ICT experts and lecturers responsible for the subjects. This study demonstrates that lecturers' interest and confidence to integrate new technological ideas in the learning environment tended to be limited by the timeframe requirements of the study.

5.4 Concerns experienced during the design process

Lecturers had different concerns at the beginning of the design process. Lecturers, especially the novices in team one, were concerned about their lack of ICT skills and knowledge. Experienced lecturers in using ICT were concerned that some users (lecturers) of the course website would not co-operate and use the online learning environments to their expectations. During the design process, lecturers discovered that planning and designing an e-Learning environment is a

complex process and does consume a lot of time and mental energy. For example, lecturers had to plan the content, organise the learning events and create quality and effective activities that would promote individual learning. This was a different task for novices although they enjoyed the experience because the technical team slowly directed and showed them what to do. This study confirmed that lecturer concerns and ICT problems would decrease when they had a very good rapport with technological experts such as the IDs and ICT experts. Lecturers who receive continuous support from ICT experts tend to be keen in expanding their ICT knowledge, skills and learning environments through continuous exploration.

5.5 Improvement in ICT skills and knowledge

Basic ICT training and assistance was given during the design process; all lecturers benefited and mastered the important skills which prepared them to teach online and communicate with the distance students. These lecturers enjoyed the design experience and began planning more advanced learning activities even before the end of the semester. This experience challenged most of them to attend a variety of ICT training courses offered at CEDIR (Center of Educational Development Interactive Resources) within the university. This experience indicated that lecturers who are supported well are more likely to integrate ICT into their teaching and as their confidence in using ICT grows they will begin planning more advanced features to improve their teaching.

5.6 The seven steps of team collaboration

This study affirmed the team collaboration steps outlined by Johnson and Johnson (1997) in Table 5.1. This study demonstrated that in this context, team collaboration could only be successful when objectives of the e-Learning design projects are defined and understood by all members (lecturers, IDs and ICT experts). Allowing lecturers to design learning activities in their own styles, and being themselves in the learning environment, encourages them to commit their time, resources and effort during the design process. Lecturers in this project had a great rapport between them because participants communicated freely and openly with each other. According to Johnson and Johnson (1997) team collaboration refers to participants discussing together every aspect of the work they are engaged in. Lecturers in this study demonstrated a positive team

collaboration technique where participants openly expressed their lack of ICT skills, fears, concerns and problems right at the beginning. Out of the seven collaboration steps mentioned above only five steps were employed in this study, the two steps as explained early (rebellious and differentiating and terminating) were not used because lecturers had good rapport and respected each other. Secondly, the design experience helped them to realise their ICT needs so they continued working and calling on ICT experts to support them. This study indicates that successful team collaboration occurs when participants clearly understand the goals of the team, their individual roles and how and what support will be given to them. The team collaboration steps by Johnson and Johnson (1997) can be used as a guide to help team members work together.

5.7 Impact of the design process on participants

The design process was a complex procedure for novice lecturers and the IDs in this study. Lecturers discovered that it was not just a simple process of transferring their teaching materials from the face-to-face context to the e-Learning environment. The process required careful considerations in instructional design, use of appropriate activities that would create meaningful learning, and a good rapport with IDs/ICT experts. Raising awareness and developing a clear understanding of the values of ICT in learning by both IDs enhanced lecturers' positive motivation to participate in the project. At the end of the experience, all lecturers took different approaches to improving their skills. Some attended basic ICT courses offered at CEDIR (Centre for development & interactive resources), others took private lessons with other ICT experts, while confident ones began working on the next level of their e-Learning. This study has demonstrated that lecturers can embrace the idea of using ICT in all the subjects they teach if they receive continuous training and support from IDs/ICT experts.

5.8 Summary

The study revealed that lecturers in both teams required ICT advice and support from the IDs and ICT experts throughout the design process. Novice lecturers were quite concerned about their lack of ICT skills but were able to cope with the pressure of learning the skills applying them to their e-Learning environments

when they assured that ICT support would be available to them at all times. Group meetings enabled lecturers to discuss issues of interest, express concerns and in some cases, training occurred during group meetings. Lecturers enjoyed the design process because they were allowed to use their own pedagogical methods in the e-Learning environment with help from the ID. The collaboration process was a success because both IDs outlined very clearly at the beginning the timeframe of the project, individual roles of members, and the plan on how training, support and advice will be provided. Group meetings enabled participants to discuss issues, concerns, problems and training was also conducted during some group meetings. The open communication strategies used by members of both teams proved that professional lecturers can not rebel when they understand their roles and realises that the ID/ICT experts are listening and willing to provide training, support and advice to individual members. McCormack and Jones (1997) expressed that the development of online teaching and learning is not a quick and simple process and the findings of this study supported this idea that novices lecturers would require a lot of time and support from IDs. The design process, training and ICT support for lecturers in PNG may not be as simple as this current study nor will it be like the design model set out to change one whole university (Collis, 1997) because lecturers will need time and space to think and work with IDs to learn the techniques of using ICT in learning. Therefore a model has been designed from this study for lecturers and IDs/ICT experts to be used as a guide in developing countries. This model will be discussed in chapter six.

CHAPTER SIX

CONCLUSION

6.1 Introduction

The study endeavoured to do an in-depth investigation on the collaboration strategies that were used by two teams of professional lecturers and IDs as they design e-Learning environments in a western university.

This chapter presents the implications of the study for the PNG setting and particularly at PAU (Pacific Adventist University) where the researcher works and the following areas that will be covered in this chapter are:

- Staff training and development in Papua New Guinea (PNG)
- Reasons for preparing lecturers and educators in PNG to use ICT
- Lecturers in PNG require continuous ICT training and support
- ICT training model in PNG
- Lecturers and IDs responsibilities
- Where does this model fit into the busy program of academic institutions in PNG?
- Principles of the study that could be applied to the PNG setting
- Recommendations for further studies
- Conclusion

The result of this study supported the views of Collis (1996), Keppell (1997) and Liu et al (2002) that lecturers need IDs to support and assist them throughout the e-Learning design process. The lecturers in the study emphasised that their success came as a result of the continuous support and training they received from the IDs and other ICT experts.

6.2 Staff training and development in Papua New Guinea

Training lecturers in PNG to use ICT in the learning environment is crucial (Vaa, 2002). Basic ICT training programs along the lines indicated here should be introduced to prepare lecturers/educators in higher institutions in PNG. The ICT training programs should be planned according to the requirements and needs of the lecturers and should offer training in stages from basic to advanced level

(Shaw, 2002). This would give lecturers the choice of training at the level that would fulfil their ICT requirements.

Preparing lecturers to use ICT in the learning environment should be a top priority of tertiary institutions in PNG. As such the initiative taken by AUSAID and the PNG government to establish multimedia centres in five teacher colleges in Papua New Guinea has given lecturers and students in those colleges the opportunity to master the basic ICT skills and knowledge and prepare them to use ICT in their work. These five teacher colleges and other institutions using ICT require ICT experts and IDs who would be committed and willing to support and train them continuously to integrate this learning in their teaching. Another initiative that is currently underway by AUSAID is to integrate ICT into the distance learning program to provide more opportunity for students who cannot attend classes. Distance Learning directors are now planning distance learning subjects from the Primary school level to the Secondary school level. The next stage would be to have these subjects offered in an online environment. This is where basic ICT training for teachers (both primary and secondary) becomes very crucial in PNG, (Vaa, 2002).

Pacific Adventist University (PAU), where the researcher works, is also planning to offer Distance Learning programs in the near future. This is where training would be required for lecturers who would be involved in the program. PAU does have enough technological resources and facilities to use e-Learning, but the main problem at this stage is to prepare lecturers who would be involved in distance education by offering basic training programs.

Lecturers at PAU are computer literate but they would still require training and support to use ICT in learning and teaching. Being familiar with the use of technology is not enough as indicated here, because teachers need to think about designing learning that will be student centred. Preparing lecturers well in advance to master technology will give them the confidence to plan and design effective learning resources with assistance from IDs or ICT experts. Lecturers and ICT experts successfully collaborate when there is mutual understanding between them on the purpose of the project and the reasons why they are encouraged to use and integrate ICT in the learning environment. The collaboration process will be effective when lecturers know that the faculty dean,

the course co-ordinator and the ID/ICT expert fully support their plan to use ICT in learning.

This study demonstrates that introducing e-Learning programs requires team members (lecturers and technological experts) to discuss the design plans and different issues and problems collaboratively throughout the study. Involving lecturers right at the beginning gives them a sense of ownership in their subjects, encourages them to express their concerns and fears about using ICT to the IDs/IT experts who were available to support and guide them throughout the design process. Tertiary institutions in Papua New Guinea, especially PAU, should begin the design process by analysing the ICT needs and requirements of lecturers so that appropriate training and support would be given to help prepare them to integrate ICT into the learning environment. Welsh (2002, p.1) expressed the view that:

...new technologies offer designers many options for mixing and matching instructional contexts. Monolithic concepts of instructor-led workshops, computer--based training and classroom instruction give way to hybrid course designs that include a combination of technology-mediated events.

According to Dede (1996), IDs and ICT experts will have to be prepared to face the challenge of designing quality and effective learning resources that will supplement face-to-face interaction in real-world settings. Lecturers should be prepared to create learning activities that requires students to:

- use their initiatives;
- work in teams on authentic activities and real work tasks;
- select the best method of carrying out the task from a diversity of learning methods;
- utilize the powerful features of advanced technologies and
- engage in activities that will challenge their cognitive abilities.

This study demonstrates that open communication and dialogue leads to sharing of ideas and effective collaboration that assists lecturers to build their confidence in skills and ability to integrate technology into their work.

The results of the pilot project (chapter one) carried out at PAU confirmed that most lecturers would require basic ICT training before they would be ready to use it in e-Learning environments. A specific basic ICT training program has to be

planned according to their needs. This should assist them build their confidence in using different ICT features before engaging them in designing their own online learning environments. It is the IDs' /ICT experts' job to prepare lecturers to use multiple technologies to aid their teaching and challenge the learners to control their learning and benefit from it. Waltz (2003) and Sims, (1997) asserted that technology could easily become merely a tool for maintenance and not innovation, if lecturers do not utilise it to its fullest potential.

6.3 Reasons for preparing lecturers and educators in PNG to use ICT

Many studies have shown that technology enhances teaching and learning (Sims, 1999; Barnett, 2002; Bennett, et al., 2002; Pratt & Pallof, 2000). Lecturers in developing countries such as PNG require specific ICT training to help them to meet increases in demand for distance education as many students are unable to physically attend a tertiary institutions due to lack of space. Vaa (2002, p.206) stated that 'the broadcast media are of vital importance for PNG education. Both radio and television are being used and the Media centre, installed by the Japanese, is a significant resource that needs to be maintained appropriately along with adequate staffing resources.' The need in PNG is to prepare and equip human resources to learn how to use and maintain the range of ICT for educational purposes. Basic ICT training will empower lecturers to comfortably use ICT to create learning resources for PNG learners from diverse backgrounds, with different expectations and learning styles. Lecturers who are computer literate still require basic training and ongoing support to help them use ICT to aid their teaching as they try their best to meet the policy guidelines of their institutions, the government and the demands of different groups in PNG society. The drop out rate of school leavers in PNG is increasing each year (<http://www.thepostcourier.com.pg>, 3 February, 2004) and this has increased the number of enrolments in distance education centres at UPNG, UNITEC and in Colleges of Distance Education. E-Learning is currently being used at a very basic level but constraints as high cost of equipment, telecommunication services and lack of skilled support services and training limit its potential.

E-Learning would give school leavers enrolled in distance education a chance of having access to various types of technical and tertiary education, provided they

have access to a computer that has an online connection to an e-Learning environment. The current focus of attention is likely to be delivery of e-Learning materials and other issues such as screen design or navigation are likely at this point of time, to receive less attention. However, a balance has to be made between establishing the right type of e-Learning resources and selecting the appropriate pedagogical method to support learning. This has to be the current priority of training and support programs for lecturers in PNG.

Most lecturers in PNG are novices in the use of ICT to support learning. They need guidance and ICT support to help them master the skills they need to prepare effective e-Learning activities that would challenge learners' cognitive skills and abilities. Lecturers also need to use technology to build strong networks and share teaching resources with their colleagues and this will only happen if they are comfortable in using technology.

They should also be trained to access and analyse the tremendous amounts of information that is available on the World Wide Web. Tertiary institutions in PNG have different technological equipment so training programs should be planned according to the needs and resources available in their work. The multimedia centres provided by AusAid for the teacher colleges in PNG have proven that providing basic training and continuous support encourages lecturers to consider different ways of teaching using ICT as a tool (Shaw, 2002). Shaw further stated that under this AusAid funded program, '...the centres will provide opportunities for different, improved and more efficient ways of teaching and learning. To make best use of this potential will require some changes in teaching approaches and methods' (Shaw, p.3). This study provides some directions that such approaches and methods might take. For example, IDs and educational trainers should conduct basic ICT training workshops on how to use to design learning activities using ICT. Begin with basic lessons than move on to more complicated techniques such as, developing a subject website. Technology itself does not guarantee learning (Jonassen & Land, 2000), therefore it is important to prepare lecturers to use technology while realising that they will have to change their teaching approaches and methods. Lecturers need the skills to communicate, reflect and revise their students' work, while at the same time they should assist learners to engage and manipulate their learning; e-Learning,

provided by well-trained, skilful designer-lecturers, is the way to facilitate these processes.

6.4 Lecturers in PNG require continuous ICT training and support

Effective uses of e-Learning resources and tools are now part of the renewal process of teaching and learning. There is evidence as indicated in this study as well, that the lecturer plays a crucial role in the quality of the technology impact on the learning process. From observation in this study, lecturers who are determined to collaborate with ICT experts/IDs and are willing to use advanced pedagogical methods using ICT, are usually successful in the application of the technology to their teaching and are keen on improving their e-Learning skills, in gaining further experience in the use of resources and tools.

Most developing countries including Papua New Guinea are slowly adopting the idea of utilising ICT to support teaching and learning. Vaa (2002, p.204) reported the following views from five organizations in PNG about the current level of ICT access and use:

- ‘ICT development is ad hoc and there needs to be a blueprint for ICT development so that change is uniform and not staggered.’
- ‘In PNG we do not really have an ICT infrastructure.’
- ‘PNG needs as much assistance as possible otherwise it will get lost.’

The report stated that only two universities (University of Papua New Guinea (UPNG) and University of Technology) are providing tertiary programmes through distance mode to cater for the increasing number of school leavers who are unable to go beyond grade 12 due to limited space in tertiary institutions. Vaa (2002) mentioned that, ‘UPNG is working in partnership with Telikom PNG in a venture through which the university is moving into multimedia distance education through its 14 regional centres’ in the country. Out of these 14 regional centres only five of them have a computer lab and each lab has 20 computers which is networked to the UPNG intranet system. The report also reveals that nearly all academic staff at UPNG have networked PCs but that does not mean that they are able to use ICT in their teaching.

Vaa (2002, p.205) further noted that ‘...the Department of Education plans to increase its existing computer network systems, develop a website, provide specialist training for information technology staff and provide audio and video conferencing to some remote schools on trial basis.’ It also states that the government of PNG plans to develop a government-owned network on Education and Research Network (ERNET) with an aim to link all the tertiary and research institutions throughout PNG. These are very important plans, which would only be successful if academics are given basic ICT training before they are required to use these websites and e-Learning environments. Plans for ongoing support and assistance should be put in place before any form of ICT training program is conducted. This would indicate to academics that their needs would be taken care of as they use ICT in their work. As such, IDs in the current study clearly outlined the protocols for providing training and assistance to lecturers at the beginning of the design process. They explained that training and help would either come directly from them or from other ICT experts and this encouraged the lecturers to be more determined to learn the ICT skills because they realised that support would be available to them at all times.

Almost all academics in tertiary institutions in PNG, including PAU are using the traditional pedagogical methods in their teaching procedures so introducing the use of ICT to support both teaching and learning would require each institution to analyse their needs before putting together a training package that would well suit the available resources, culture and skill level of lecturers within their institution.

There are qualified computer experts, information technologists, computer engineers etc., in PNG but the country still lacks Instructional Designers or ICT experts who have the experience in developing e-Learning resources for face-to-face and distance learning. This study indicates the steps that developing countries should take when considering the use of ICT in learning. E-learning is being introduced at different levels in some institutions in PNG. For example, lecturers in the eight teachers’ colleges have been exposed to e-Learning environment through the AUSAID sponsored education program (Shaw, 2000). Under this program, all lecturers’ in the teachers’ colleges have to do a compulsory subject called, *Introductory to Basic Computing* and a component of this course requires them to create a basic subject website. Despite these training programs, lecturers could not fully use ICT in learning because it will take time for each of them to gain their confidence and in other cases, they do not have enough computers to practise the skills they are

learning. The opposite is true in other tertiary institutions, they have the resources but lack skilled personnel to support and train lecturers.

PNG still has a long way to go because the level of computer literacy in the academic environment 'is generally quite low', Vaa (2002, p.204). It would be easier for IDs and academics in PNG to learn from the different design projects created by teams of experts (IDs and lecturers) in developed countries, before planning and designing their own.. PNG needs skilled and experienced IDs to provide training and support to lecturers and to prepare them to face the challenges of using ICT in the learning environment.

To enable lecturers in PNG to see and experience the value of ICT in the learning environment, the first step is to run basic ICT skills courses for them. The IDs in this study emphasised ICT training for lecturers right at the beginning but due to time limitation on their projects, team one used an ICT expert to provide individual ICT support where required, while the ID actually provided the required training to individual lecturers. Kemelfield (2001) argued that continuous ICT support and assistance is very important to keep lecturers interested when engaging them in designing online learning environments. Lecturers will only collaborate and commit themselves in integrating ICT into their work when they realise its value in the learning environment (Alexander and McKenzie, 1998) and learn how they can wield it to explore their interests and enhance their teaching (Knowles & Schewier, 1997). The findings from this study support the ideas put forth by Palloff and Pratt, (2000), Salmon (2000) and Lai, (2001) who emphasised the importance of training and supporting, lecturers/educators in gaining the skills, confidence and motivation to create their own e-Learning environment while updating and maintaining their online subjects. Lonergan (2001) claimed that technological assistance, support and advice would best come from IDs, information technologists (IT) and subject experts or subject matter experts.

Setting a timetable for basic ICT training courses for lecturers is not an easy task due to their tight work schedules. Therefore, having a team co-ordinator is very important to assist the IDs/ICT experts to plan training courses and arrange meeting dates and venues. Successful training courses are those that have committed members (lecturers, ID/ICT expert). Kemelfield (2001) concluded from the RMIT training package, that successful lecturers were those who had the time to meet on a regular

basis. Training courses should be short and specific to meet the interest of individual lecturers within the team. Knowles (1978) stated that adult learners learn best from real life experiences, therefore lecturers should be guided and supported as they design their individual e-Learning environment. Team collaboration gives lecturers a sense of ownership of their courses, reduces isolation and facilitates innovation in their teaching approaches. Lecturers will always have different sets of concerns about the design process itself, skills, challenges and different confidence levels in using ICT, therefore an evaluation should be done by the ID at the end of the design process to assist participants to see areas that require improvement.

Team collaboration should include lecturers, IDs/ICT experts, administrators and finance people. Studies on cost-benefits and cost-effectiveness have not yielded conclusive evidence, as there are many hidden costs involved according to Barnett (2000) who further warns against questions about whether technology can be used to deliver learning more cheaply. The values and benefits of integrating ICT in learning cannot be quantified because this depends on conditions and the different goals set by lecturers and the final outcomes in relation to how these goals are achieved.

Felton and Evans (2002) reported that staff training in using ICT in learning was successful when it was based on the individual lecturer's needs before actually engaging them in designing their online subjects. Lecturers who are comfortable in using ICT in the learning environment would begin planning more advanced work for the learners. It was seen throughout the design process in this study that many of the participants would always verify their ideas with the ID before including them in their e-Learning environment. This supports findings from other studies (Ellis & Phelps, 2000; King, et al., 2000; Grubba, 2001; Felton & Evans, 2002) which emphasised the need of having IDs and ICT experts in academic institutions to provide the support and the assistance lecturers/educators would require. Tertiary institutions in developing countries such as PNG should have available on their staff an ID or an ICT expert who has experience in developing e-Learning environments, as she/he would be the appropriate person to advise and assist lecturers as they design their online subjects. The skills that lecturers learn during the training period would be transferred to the learner through appropriate tutoring therefore it is important for lecturers to receive appropriate ICT support.

Although participants in this study were experienced lecturers they nevertheless had difficulties in selecting suitable e-Learning teaching methods for their individual subjects, so they mostly used the teaching ideas and techniques supplied by the ID. Designing specific training lessons for busy lecturers as demonstrated by team two in this study will only work when training and mentoring is provided to address each individual's need. Team collaboration requires regular communication amongst team members and a good working relationship. Lecturers in this study had great rapport with each ID and had confidence that they would be able to assist them create effective learning resources for their subjects. Cross fertilization of ideas will only work well when team members communicate well and respect each other's expertise.

Lecturers in this study admitted that setting appropriate activities in the online learning environment was a great challenge and they were grateful to the ID for supporting and directing them throughout each stage of the design.

This study has demonstrated that:

- lecturers who are novices in using ICT in the learning environment can easily get discouraged if they do not receive enough support and assistance from an ID/ICT expert;
- basic ICT training programs should be specifically designed to meet the needs of participants. Individual training should be carried out where required;
- ongoing support should be provided to lecturers throughout the design process;
- lecturers will show lack of interest if appropriate technological resources are not provided to them;
- the IDs' and ICT experts' prompt response to the lecturers' queries, concerns and problems was an inspiration for lecturers to keep working and work more effectively.

6.5 ICT training model in PNG

In chapter one of this dissertation, a model of team planning and designing online learning environments by Edgar (2000) was adopted to guide the investigation into how lecturers and IDs/ICT experts collaborate together (Figure 1.1). The current study showed that effective team collaboration began when participants in both teams accepted their individual tasks took the time to attend group meetings

and underwent short training programs that were conducted by ICT experts. Thus the instructional designers played an important role in facilitating and encouraging the processes of knowledge and skill development.

This study also showed that lecturers, especially the novices, discovered that they should have attended the basic ICT courses offered at CEDIR when preparing for the design process. Having the ICT skills could have made the design process a lot easier, and would have allowed them to concentrate on designing learning resources rather than spending time learning how to use software. Nicholson and Bond (2003) argued that computer literate lecturers still require training to help them integrate technology into the learning environment as they need to be confident when employing the computer for learning purposes. They also need to apply their normal practices such as classroom management, when they effectively using a computer as a teaching tool. During this study lecturers (L2 & L3) required students to use both synchronous and asynchronous discussion in their subject websites, although they had no experience in this field. As a result they were originally overwhelmed by the amount of work involved in developing and administering this activity. Such an experience suggests that all lecturers who are inexperienced in the use of ICT in education need to undergo basic training so they can experience, first-hand, the use of ICT from a learner's perspective. This experience will help them in their decisions about how to effectively use ICT with their students.

Team collaboration is also very important for lecturers and technologists in developing countries such as PNG. Using ICT in the learning environment is a new concept that lecturers in PNG need to understand. At present the teacher-centred approach (transmissive learning method) is used by nearly all lecturers at tertiary level in PNG, so getting them to adapt to the student-centred approach (constructivist approach) would require IDs/ICT experts to train, support and advise them.

This study sought to unveil the team collaboration strategies that enabled the IDs and lecturers to work together in designing online learning environments for postgraduate students (face-to-face and distance students). It was carried out in a tertiary institution from a developed country because it had the resources and experienced ICT experts/technologists to support lecturers. Lecturers, especially

in team one and users (lecturers) of the course website in team two were novices in integrating ICT in their teaching. Their learning experience turned out to be quite positive, which set some simple guidelines that might be beneficially adopted by design teams in PNG.

It may be argued that lecturers in developed countries are more exposed to technology and are more computer literate so their experience will not be suitable to similar situations in developing countries such as PNG. However, technology is already available in tertiary institutions in PNG since 1990 (Evans and Ninol, 2003) and most lecturers have been using it in their work, (Vaa 2002; Shaw, 2002). Therefore, the process of assisting and training novice lecturers could be similarly applied in both developed and developing countries.

The team collaboration guidelines by Johnson and Johnson (1999) were observed in this study: that experts (lecturers and IDs/ICT experts) will only collaborate with each other when there is a clear understanding of their individual roles. For example, lecturers in this study co-operated with the IDs because they were involved right at the beginning in defining and structuring the design process and felt that their work, ideas, comments were valued by the IDs. From the result of this study the researcher has outlined a model that would assist the ID or the ICT experts as well as lecturers experienced in using ICT to plan an appropriate ICT training program for lecturers at PAU and similar PNG institutions. The training model is shown in figure 6.1. Based on the results of this study a proposed training model is shown in Figure 6.1. This model differs from the one suggested by Edgar (see Fig. 1.1) by including an additional stage (stage one, assess lecturers needs and develop a guideline/program) in the training process. This model is suggested as one for implementation in the PNG setting and is supported by the findings of the study and the researcher's own experience in her university. This model contains more detail information for IDs to use in any ICT training program.

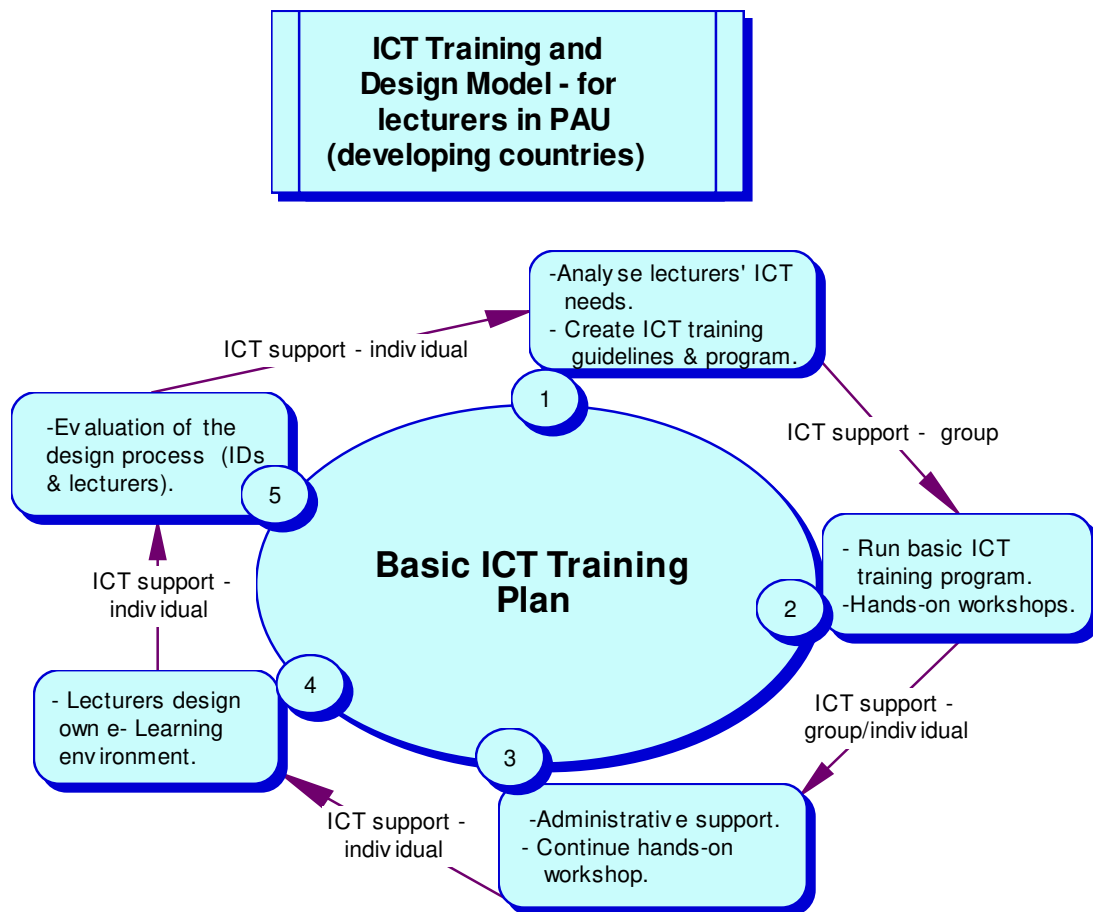


Figure 6.1. Basic ICT training program

The model presents a five-step process designed to support the development of lecturers who are novices in the design of e-Learning environment. The steps may be summarised as:

- Step one: The ID will analyse lecturers' ICT needs and create a policy that will guide both lecturers and the ICT technical team.
- Step two: Lecturers will be given basic ICT skills training before involving them in the project.
- Step three: ID and ICT experts work closely with the PAU administration and Lecturers.
- Step four: Lecturers apply the new skills acquired in their own e-Learning environments and ID will provide on-going support and guidance.
- Step five: Participants will evaluate their work and thus the cycle starts again but at a higher level.

Integrating ICT into the learning environment would require lecturers to change their attitudes from those of individuals working in isolation, to those of collaboration, sharing of ideas and '... focusing on developing a clear

relationship between technology and the curriculum...' (Sherry & Gibson, 2002). Studies into the failure of unsuccessful ICT training programs for lecturers/educators demonstrated that lecturers require continuous ICT support, advice and assistance (Hedberg, 1989; Ellis & Propis, 2002; Herrington & Oliver, 2001; Sims et al, 2002).

Other studies have shown that some lecturers resist change (McMurray & Dunlop, 1999). However, the research of Collis, (1998), Ellis & Phelps (2000) and Torrisi-Steele and Davis (2000) is supported by the findings from this study in that lecturers who have good rapport with the ID/ICT experts, and are supported well during the training and design period, enjoy their work and begin improving their ICT skills, knowledge and subject resources. Lecturers who do not co-operate at the beginning of a task will find it hard to cope with the design work and will discover that they may not have the skills required to confidently use ICT in their teaching.

6.6 Lecturers and IDs responsibilities

To avoid the problem of making novice lecturers in PNG (especially at PAU) feel that the planning and design process is burdensome; it would be wise to introduce the ICT skills in different stages from the basic level up to the advanced level as presented in the ICT training model (Figure 6.1). It is also important for team leaders to clearly outline the type of assistance that will be provided and who will be responsible for training and supporting lecturers. This study demonstrates that each participant in the process has specific roles and responsibilities in the development of e-Learning resources. Figure 6.2 outlines some of these responsibilities for IDs and lecturers in the design process.

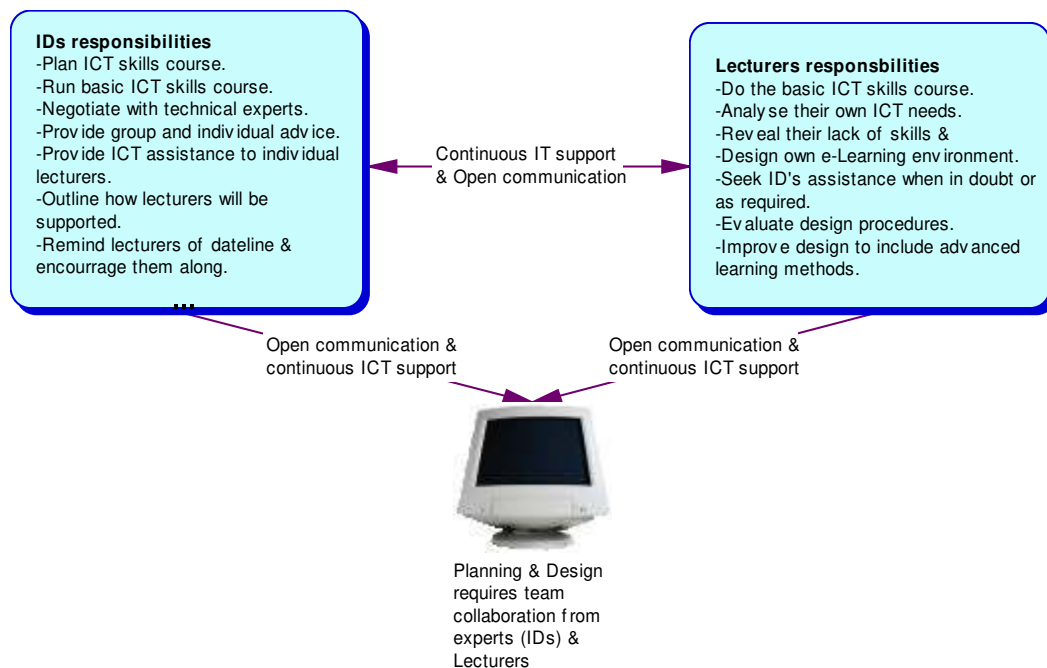


Figure 6.2. A guide for IDs' and lecturers' responsibilities

Figure 6.2 outlines the roles and responsibilities of IDs and lecturers in a design process. King et al., (2000) stated that IDs know their responsibilities but often they have to wait on lecturers, faculty and staff to invite them to provide assistance. Lecturers in developing countries will require more ICT assistance so this is where the ICT training model, figure 6.1 would guide IDs and ICT experts to provide appropriate help to each stage outlined in the model to support lecturers.

6.7 Where does this model fit into the busy program of academic institutions in PNG?

As previously mentioned, most organizations, businesses and higher academic institutions in PNG have been using ICT as early as the 1990s (Evans & Ninol, 2003) but ICT is not being used by lecturers in their teaching. ICT resources are already in place but lecturers have to be trained. Integrating ICT into the learning environment is a big step for lecturers in developing countries and they would require a lot of support, training, coaching and advice from IDs and ICT experts and the technical team. Tertiary institutions in PNG do have their own ICT centres who are run by specialists such as, computer technicians, graphics designers, web developers, media experts etc, but apart from all these specialists, tertiary institutions will still require IDs and ICT experts who have the experience in designing e-Learning environments to assist and advice lecturers. PNG does

have IDs who are familiar with developing learning materials for face-to-face delivery (Vaa, 2002), however tertiary institutions today would require IDs who would assist lecturers to use ICT to design e-Learning materials and resources for learners. PNG as a developing national would have very few professional IDs who are exposed and even experienced in designing e-Learning environments (Shaw, 2002). As a developing national we would be challenged to employ professional and experienced IDs/ICT experts from outside (expatriates) who would provide appropriate assistance and support to lecturers and supporting technical staff. The researcher believe that the ICT training and design model will guide and set a clear direction for IDs, ICT experts, lecturers, faculties and even the administration of tertiary institutions to follow as they plan the team design strategies for lecturers in their institution.

6.8 Principles of the study that could be applied to the PNG setting:

The following principles were derived from the study and are the basis for the suggested model that the researcher believe will guide IDs, lecturers and the decision makers (Administrators, Deans etc) as they plan to work together.

1. ID/ICT expert must initiate the first group meeting for lecturers to brainstorm their ideas expressed their ICT requirements and concerns.
2. ID/ICT expert need to analyse the lecturers' ICT requirements, examine the available resources then check the IT policy of the institution (if there is one) before creating a policy or set of guidelines for the training and support program.
3. Develop basic hands on ICT training lessons tailored to meet lecturers' ICT needs. Training (workshop) should be conducted in small (5 to 6 lecturers) groups so individual needs can be met. Duration of the training program will depend on the ID's evaluation on how lecturers acquire the required ICT skills.
4. Before the actual designing stage, the ID/ICT expert show lecturers a variety of successful e-Learning environments as samples to give them different ideas.
5. Provide concept maps, charts, knowledge maps or some kind of guidelines to help lecturers plan their subject contents.

6. ID update the appropriate body concerning the progress of the work, for example, in PAU the administration will be updated on the training program.
7. Continue providing hands on workshops to the group or to individuals if they have mastered the ICT skills and are ready to design their own e-learning subject.
8. Encourage lecturers to share experiences, concerns, pedagogical and ICT skills to other members of the group.
9. ID/ICT expert encourage lecturers to conduct formative and summative evaluation.
10. ICT support has to be available when lecturers re-design and improve e-Learning environments.
11. ID/ICT expert have to be optimistic all the time when dealing with novice lecturers. Respond promptly to lecturers' queries and questions. Provide continuous assistance and support to individual lecturer.
12. Set up ICT support units within the established IT technical centres in tertiary institutions, especially at PAU where lecturers can go to for help. Currently there is no ICT training program available to lecturers at PAU.
13. Educational Institutions must employ an ID/ICT expert who is experienced in using ICT in the e-Learning environment to direct the training program. PNG as a developing nation would require experienced professionals so each university need to budget for an ID. If a tertiary institution cannot employ an ID/ICT expert within the country, they should budget for an expatriate consultant according to the Employment of Non Citizens Act 1978 – 83, Act. Section 6 (1), on the five year plan towards nationalising positions, so the expatriate consultant would train nationals who would be skilled enough to carry on the job when he/she leaves.

The researcher from her experience in her own university and from her studies believes that this model will guide the decision markers (Administrators, Deans etc), lecturers and IDs and the ICT team as they collaborate together in planning and designing e-Learning environments. The study revealed that when lecturers are supported, they gain confidence in using ICT and look for creative ways of improving their teaching with the use of e-Learning environments.

PNG can use ICT in a very beneficial way if lecturers receive adequate ICT training and support from experienced and professional IDs and ICT experts. In PNG, lecturers do not need a lot of resources to begin with, students either in school or via distance education in urban areas can be reached if they have access to the internet and are able to use the e-Learning materials that would be made available to them (Evans & Ninol, 2003).

6.9 Recommendations for further studies

This study focused on the team collaboration techniques and concluded with a model of how to prepare lecturers and educators in a developing country (PNG) to cope with the idea and practice of using ICT in the learning environment. The study has suggested a model to be implemented at PAU which suggests that basic training must be offered first to lecturers before inviting them to participate in planning and designing their individual e-Learning environments or before expecting them to use the computer as a resource to assist in their teaching. The model was formed from a specific case study that monitored the situation of novice lecturers working with ICT experts to develop their course websites. It would be appropriate for another investigative study to be conducted at PAU where this model will be implemented. Furthermore, this model could be used as a guide to assist lecturers and ICT experts at PAU as they collaborate to use the type of technology available in the institution.

The recommendation for further studies draw upon both the findings and the limitations of the study. The list below serves as guide to future researchers in the area of ICT use in learning and staff training and development.

Collaboration strategies employed by IDs and Lecturers in PAU

Further research should be carried out on how IDs and lecturers in PAU collaboratively plan, design and maintain their e-Learning environment and it is anticipated that the result of such study can be applied to other institutions in developing countries. This would provide more information on how to improve the type of support that lecturers would require to improve their skills of designing more effective e-Learning environments that would benefit their particular students.

Use of the ICT training model

This study did not explore the benefit of e-Learning from the lecturers' perspective because the study focused mostly on the team collaboration strategies and did not include how lecturers used e-Learning environment which would have given them an opportunity to evaluate the power of ICT in learning. Replicating this study using the ICT training model with a larger number of participants (lecturers & ID) in PAU or another tertiary institution in PNG would provide a clearer picture of the different strategies that would improve and benefit lecturers and IDs as they collaborate in designing effective and quality e-Learning environments.

Future research needs to continue to examine the team collaboration process in developing countries as a way of understanding how to provide ongoing support to lecturers in tertiary institutions. Further exploration of the effect of integrating ICT in the learning environment will contribute to planning of effective staff development programs, in developing countries such as PNG.

The use of e-Learning at PAU and other PNG tertiary institutions

Future research carried out in Papua New Guinea on collaborative planning and design of e-Learning environments should seek answers to these important questions designed by IDs in Glasgow Caledonian University (2004). Participants (IDs and lecturers) need to ask these questions to assist them plan and design more effective and meaningful e-Learning resources and activities for both face-to-face and distant students.

- What are the intended learning outcomes of the module?
- Which pedagogical model will help the students to achieve these?
- How will the learning outcomes be assessed?
- Which activities and resources will enable the students to achieve the desired learning outcomes?
- What added value can e Learning bring to the learning and teaching process?
- Is it a blended or online course?
- What is the profile of the students likely to be?
- How many students will there be?
- What access do they have to networked computers?

- How many tutors will be required?
- What combination of face-to-face and online elements would best suit the learners' needs?
- Who will be expected to provide technical support to students and tutors?
- Will staff development be required?

Answers to each of these questions would guide lecturers and ICT experts/IDs to create a variety of authentic and interesting learning activities and resources that would challenge PNG students to be more responsible for their learning.

6.10 Conclusion

Developing countries cannot avoid the fact that lecturers in tertiary institutions will have to integrate ICT into their subjects and they will soon be invited to learn the ICT skills and getting them involved in such training can be frightening for some of them. If training programs are not planned properly then lecturers can be turned off and may refuse to use ICT in their teaching. Training lecturers to use ICT has to be carried out in stages, Bain (1999, p.170) states that, 'progress with complex human endeavours is usually made in small steps.' This is where the developed ICT training model can be used as a guide to groups/teams in an educational institution as they plan the different stages of their ICT design process.

Using ICT in the learning environment is a new and challenging experience for lecturers in tertiary institutions in PNG but it is hoped that the model will give more direction to IDs as they assist lecturers to prepare e-Learning materials for both face-face and distance learners.

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Appendix One

Ethics Committee approval documents

Appendix Two

**Information and Consent Form
For Faculty Lecturers**

Appendix Three

**Information and Consent Form
for Instructional Designers**

Appendix Four

First Interview (Instructional Designers)

Interview Questions for Instructional Designers (IDs)

1. Briefly tell me about your educational background
2. How long have you worked as an ID?
3. What is your role at UOW?
4. Specify the type of support and assistance you provide to lecturers.
5. How do lecturers prepare their materials for online subjects?
Electronic/manual?
6. Do you allow lecturers to express their idea on the type of activity they would like to have on their e-learning environments?
7. Is there a standardise website format for each faculty within the university?
8. Briefly explain the strategies you would use when working with lecturers in designing their online subjects.
9. Do you always work with them as a team or do you sometimes design the e-learning environments on your own?
10. Is there anything else you would like to tell me concerning your job as an ID?

Appendix Five

First Interview (Faculty Lecturers)

Interview questions for Lecturers

1. Are you going to alter your subject in anyway?
2. What are you expected to do in this developing stage?
3. Who is responsible for the design of your subject?
4. Are you depending on the ID?
5. How many meetings have you had with the ID or with other lecturers?
6. What is the ID's role in this whole process?
7. What is your view towards the learners who will be engaged in this subject?
Do you think they will be better than the ones before?
8. Did you make any suggestions to the ID concerning the type of design you want in your subject?
9. Have you altered your course outline because it will be presented different (online)? If so, what did you change and why did you change it? Did the ID advise you to change it?
10. Is there anything else you would like to tell me concerning the design process?

Requests to be made:

- Copy of course outlines
- Draft of concept map of the design plan
- Any other artefact

Appendix Six

**Second Interview (Instructional
Designers)**

Second Interview questions for IDs

1. The lecturers mentioned that they are satisfied with the subjects at this stage. Are you also satisfied with the work they did?
2. Do you think they will still need your assistance during the session? Will you be available?
3. During our last interview, one of the concern you raised was, you wished lecturers had attended basic ICT training courses before actually engaging themselves in activities like that? Despite your concern you still encourage them along, does this mean you that you had confidence in their ability? Can you explain?
4. Briefly explain your assessment of the collaboration process in your team. Would you say that this project was a success because the lecturers carried out their assigned task and completed it within the timeframe you set for the project?
5. Lecturers have evaluated their e-learning environments, what is going to happen after at the end of this session? Who will be supporting them from now onwards?
6. Any other matters you would like to tell me?

Request for a copy of the CD-ROM and reading booklets

Appendix Seven

Second Interview (Faculty Lecturers)

Second interview questions for Lecturers?

1. How would you describe the role of the website in your subject?
2. Is the website serving its purpose?
3. Would you say that all the students used the website as was intended?
4. How will you describe the communication flow between you and ID during the Design process? Did you have a lot to talk about?
5. Would you say that you now have the confidence to use online learning techniques to teach your subjects?
6. Are you going to continue on this trend, having your subjects online from now onwards?
7. What would you do differently if you were to re-do some sections of the website? Do you think you would need the assistance of the ID?
8. What are some of the issues or concerns that you still have about online learning?
9. How would you describe the role of the IDs in the design process?

Appendix Eight

**Guide for Reflective Report
(All Participants)**

Reflective Report (Final Interview)

Collaboration Process

1. Can you describe your relationship with the ID or lecturer throughout the design process?
2. Do you think you did your best in your assigned role?
3. Which area would you improve?
4. In your opinion what was the secret of success in this collaboration process?

Planning & Design Process

1. How did you select the style of presentation?
 - Where you influenced by the ID? Colleagues (lecturers).
 - Why did you suggest certain models for lecturers to follow?
 - If you have to do it again, what would you change and why?
 - What was the main achievement in this experience?
 - To what extent have your understanding developed about selecting the e-Learning resources?

ICT training

1. Do you agree that lecturers (novices) should attend basic ICT skills training courses before actually designing their e-Learning environments?
2. From this experience what is your advice to other lecturers (novices) who feel that they lack the skills and knowledge to use ICT in the teaching?

Concerns

1. These were your concerns at the beginning. Are you still concern about this issues? Explain your answer.
2. Any other comments/suggestions?

Any other issues you would like to raise?

Appendix Nine

Team One's Chart

Appendix Ten

Team Two's Chart

Appendix Eleven

Sample of discussion report between
Researcher
and Instructional Designer - via email.

Appendix Twelve

**Sample of Meeting Reports
- via email to lecturers**

Appendix Thirteen

**Description of the Collaboration
Process**

Lecturer One (L1)

Background

L1 was an experienced lecturer who has more than 20 years of teaching experience. He has taught at different level of education and is a very influential academic leader in the educational system in NSW. This is how he explains his role:

The first thing I'm involved in is to sort out policy for the course because I co-ordinate the course and there are 4 lecturers involved. Then to co-ordinate the training program in this project and finally to plan and design my own subject website. (L1, 23 December, 2002).

L1 co-ordinated the project and negotiated with the ID on ICT support for the group where required. L1 has written a number of research papers in his field. He is academically qualified and has a PhD and is an expert in his subject area.

Role in the Design process

L1 described his role in the design process as the group co-ordinator. He looked at his role as a mediator between the ID and the group members. He negotiated meeting times between the ID and the lecturers and informed members of the date, venue and time of each meeting. He ensured that training sessions were in place for the group and negotiated with another ICT expert to provide ICT training for lecturers within the group. He had a special role and that was to meet with individual colleagues and encourage them to carry on with their design plans. He was very keen on having his subject online but expressed fear and doubt that he lacked the necessary skills and knowledge to design his first e-Learning environment.

Planning Methods

L1 was the only lecturer in the group who completely filled in the chart which was given to them by ID1 as a guide to assist them plan the different activities for their e-Learning environment. He followed all the instructions given by ID1 and felt so good about his achievement. L1 explains his achievement as follows:

I was a very good person , I did my homework, see there it is and what I did was I indicated what I currently do and what I wanted to do in the future and I used that as the basis of my decisions. I just worked out something on my own and I feel really good. (L1, 23 December, 2002).

He only included the learning activities that were illustrated by ID1 during their first group meeting. He explained that he uses a variety of activities in a face-to-face learning environment but he was not sure whether the ID would have time to assist him master the skills of designing those activities. After the ID approved his chart, he began searching the database for resources for his subject. He worked closely with the librarian to help retrieve the latest and most appropriate resources. Both the ID and Librarian explained the copyright laws so he arranged his resources according to the copyright rules, especially the online resources.

His resources were well arranged in order from the first lesson in week one to week 13, which was the end of the semester. He also prepared a resource book that contained reading materials for students. The planning process has to be done in four weeks and he managed to plan the features of his e-Learning environment according to the topics that will be covered. He included activities that would cater for both face-to-face and totally online (distance) learners. L1 was quite satisfied with his work during that stage. He mainly planned essay-type activities and discussion questions for the learners. His plans required students to use both the synchronous and asynchronous discussion methods. He commented that he would include different activities when he upgrades his subject website.

Design Methods

L1 depended on ID1 to direct his work. He completed his planning on time and submitted the resources and the planned activities to the ID and the technical team to design for him. They did most of the design work for him but required him to learn the skills from the ICT expert so he could manage and develop the subject website as soon as the season begins. The Home page was the same for all the lecturers in team one, but the main difference was the types of activities that were designed in each subject. L1 requested that the announcement section be placed on the Home page. He was quite happy with the design of the activity section because he actually participated in both the synchronous and asynchronous chat rooms. Learners enrolled in this subject were all adults and experience teachers, so activities were mainly discussions on real issues experienced in the education system, not so much on recalling facts. There was no animation and all pages had the same colour which did not make much difference because learners were more interested in the activities than in the website itself.

Experience with ICT

L1 mentioned that he was a novice in using ICT for learning. He only uses Microsoft word and his not familiar with other types of software programs. He expressed doubt in his own ability and skills and he was not sure whether he would be able to master the basic ICT skills that would enable him to use the subject website during the semester.

Concerns

L1 expressed his first concern as:

I'm a novice in technology but my only concern was that distance students would get equal treatment to face-to-face students. (L1, 23 December, 2004).

He was also concerned about treating students fairly. He was concerned that distance students will only complete online assignments and may not really participate in discussion activities, but was happy with the suggestion about assessing every requirement so students would see the importance and do their best. Another major concern was to find the time to read and respond to students' questions, queries and assignments. It was time-consuming to read through all

the essays and respond to them. He wanted to know more about other features of using ICT in learning but the ID could not provide that support in full because of time constraint. Two of his staff did not join the group during actual design period and he was concerned about them. One was well experienced in using ICT in learning but the other was a novice and L1 wished that they could all attend so they would know exactly the requirement of the course and do things together.

Training Visions & Ambitions

The ICT expert that joined the group supported each of them quite well. L1 was content with the training received during that stage but made up his mind to move on and learn more advance skills to enable him to update and manage his e-Learning environment. He mentioned that he enjoyed the work he did in his first website and began planning to create two more subject websites for the other subjects he would be teaching during the following semester. He plans to continue working with IDs and the ICT experts who are employed in the Faculty of Education to help him improve his current subject website and prepare learning activities for two other subjects under his care.

Reflections

L1 explained that the reason for developing e-Learning environments came as a result of having adult students who were on full time employment but were determined to upgrade their qualifications or to gain more knowledge in their subject areas, etc. L1 mentioned that the idea of using ICT emerged during the second semester of year 2002, when two students enrolled in his subject and requested to have their assignments sent via email and arranged to call (telephone) the lecturer if they required more assistance or explanation. The lecturer complied with their requests and they managed to complete the subject in a distance mode. The number of distance students increased during the first semester of 2003; eighteen students completed the subject exactly the same way as the two first students mentioned above. Some overseas full-time teachers/lecturers (Canada and Hong Kong) also applied to do the course. This prompted the L1 (course co-ordinator) and another senior lecturer to conduct a survey which indicated that quite a number of full-time teachers and educational administrators were interested in doing the course.

L1 had some experience in teaching distance students but said that his method was very simple because he only used the email. He was determine to do something to cater for the increasing number of distance students. He called the first meeting where lecturers discussed the possibility of having the subjects that would be offered during first session of 2004 in an e-learning mode. Everyone agreed and that was the beginning of the project where ID1 was invited to assist lecturers develop their individual e-learning environments. As a novice he had his concerns and doubts because he wasn't sure how the whole project would turn out. He was worried that he would not be able to cope with any ICT training programs but discovered that ID1 was very helpful and supportive. ID1 explained the development procedure in a very simple way. He enjoyed the design process and planned to have all his subjects online. He explained the down side of using ICT in the learning environment as:

Using e-Learning took up a lot of my time.. to read and also to respond to students and that takes a while and some of them write a lot or put a lot on the discussion site. (L1, 28 August, 2003).

From this experience, L1, planned to add more than one discussion topic per week and will encourage every one to participate, both face-to-face and distance students. L1 claimed that any novices could become an ICT user only if they take on the idea and give it a try. This is how he expressed his experience.

It will be amazing what you can do and I have ideas now, you know if you had asked me twelve months ago, I would say, no its too complicated to do, I don't think so. (L1, 28 August, 2003).

Finally, L1 emphasised that teamwork in a design process is the only way for lecturers to design effective e-Learning environments.

Lecturer Two (L2)

Background

L2 had more than 20 years of teaching experience at different levels of education but has spent the last 17 years as a lecturer at tertiary level. He has taught in three other countries as well as in another university within Australia. He is highly qualified and has a PhD in his area of specialty. He has some experience in teaching distance students but admitted that they mainly used the email and he never made attempt to use the WebCT site for his subject that was designed by the Faculty of Education.

L2 expressed his confidence in the design process right at the beginning. He mentioned that ID1 has the ICT skills, knowledge and experience to assist him design his first e-Learning environment. He is familiar with the Internet, he surfs the Internet every now and then for educational purposes but was excited by the opportunity of working closely with ID1 in this project.

Role in the Design process

When asked about his role in the design process, his quick response was:

Essentially, it was my job to design the assessment task and it was her (ID1) input to suggest to me how the assessment tasks were to be designed to obtain the best as far as WebCT purposes. My second job was to produce the readings, the hard copy readings for the two courses for which I was responsible. (L2, 23 December, 2002).

He further explained that searching for the latest resources from the database was time- consuming. He worked very closely with the librarian especially when dealing with soft copies of resources because he was very conscious of the copyright laws.

L2 worked extremely hard in producing the resources, he managed to compile two volumes of hard copy readings. He was enthusiastic about doing a perfect job and at the end he was extremely satisfied with his work.

Planning & Design Method

L2 planned a more advanced e-Learning environment than his colleagues. He planned out all the topics and the discussion sessions that would be held for each topic. He planned everything on paper, the type of assignments that would be required and the assessment procedure. He did not plan the learning activities according to the chart but admitted that the chart did guide his thoughts and plans.

L2 planned to design authentic activities and required both face-to-face students and distance students to be actively involved in each assignment. His explanation on the assignments was:

For the major assignment, I would require all students to write 1000 words about the topic. Students will then be divided into groups of four to respond to paper presentation in 500 words. I will then post some questions on the discussion space concerning the topic and this will give individual students a chance to debate or express their ideas. (L2, 23 December, 2002).

L2 did not plan a lot of content to be presented on the e-Learning environment but all the topics and assignments were made available to students right at the beginning.

L2 had no experience in using the discussion space but he was determined to learn the techniques of controlling a discussion and as it turned out, he had a great time responding to students' views or just following through a line of conversation between students.

Learning activities were designed according to L2's plan and after the experience he was prepared to improve his two subject websites and prepare the content of other subjects he is responsible for to be placed online. He stated:

I have two major assignments for my course, each major assignment is broken into three parts. Students were required to do a lot of thinking, reflecting, reading and commenting. I had to spend more time marking their work. (L2, 28 August, 2003).

L2 commented that there were no graphics in his e-Learning environment because the students were adult and it was unnecessary to have graphics added to their subject. This indicated that L2 was conscious of the effectiveness of his subject and wanted to provide the best learning environment for the students.

Experience with ICT

As explained earlier, L2 was computer literate but had not used the computer for teaching purposes. He had doubts that he would be able to learn all the basic skills that would enable him to use ICT in the learning environment, but he was determined to do his best in using it. At the end of the project, he expressed his success this way:

I can now say that I'm becoming an expert in using ICT in the learning environment. Students co-operated and responded well to the assigned tasks. (L2, 28 August, 2003).

L2 believed that using ICT in the learning environment requires commitment because the workload actually doubles. The lecturer has to be prepared to sit and work on the computer for long hours. He explained that his marking actually increased, in a traditional face-to-face classroom;

‘I will only mark twenty papers of the major assignment but using ICT, I now have sixty papers to mark,’ on the same assignment. (L2, 28 August, 2003).

L2 admitted that using ICT in his subject required him to spend more time than before working on the computer and commented that it was a time-consuming exercise. The extra workload did cause a lot of stress to him at the beginning but he was prepared to improve his subject presentation and use ICT from then onward in all his subjects.

Concerns

L2 was very concerned about treating both groups of students (face-to-face & distance students) fairly. He wanted to ensure that distance students were doing as much work as the face-to-face students.

He knew that the way he had planned his assignments would give him a lot of work but he was prepared to carry it out. His remark was: ‘the downside as I’ve mentioned earlier is, you are making a lot of stick for your back’ (L2, 28 August, 2003).

L2 did not know how to assistance students write short paragraphs in the discussion space. Some wrote very lengthy pages so L2 planned to work with the ID and other ICT experts to assistance him design a better way of controlling the discussion space.

He was also concerned about the students; some of them may not have the required technology so it would be hard for them to contribute to the discussion or do a good job on their assignment. Some of them may have needed some form of training to assistance them use ICT in learning.

At times he was not able to promptly respond to students’ views on the discussion space but planned to be organise his learning activities in a more orderly way because he had learned a lot from this experience.

L2 was concerned about the amount of time required to search the database for appropriate resources and compile them.

You have to do very careful research on the latest stuff, latest journal articles, as well as seminal materials, you have to review the literature, you have to prune and select and so on.(L2, 28 August, 2003).

L2 was concerned that no infrastructure support was provided to him and his colleagues. Having someone to support them would have made their work easier.

So keep in mind online WebCT supported courses which are of quality needs infrastructure support, research assistant from the institution. Basically, doing photocopy work and searching the database. I spent hours and hours on the computer, word processing study guides and reading, then revising everything. (L2, 28 August, 2003).

Lecturers will only survive well if they are supported by the Faculty or institution. L2 pointed out that using ICT in learning means being fully committed. ‘Quality is time consuming and quality is expensive’, but he was prepared to commit his time to prepare effective and quality learning resources.

He was also concerned about his own professional development at the beginning but discovered that the ID and the ICT expert were committed in assisting him learn the basic ICT skills that helped him to lead the students.

Training Visions & Ambition

The ID influenced L2 to use only certain types of learning activities in his first e-Learning environment. ID1 also displayed different technology that would assist him in the design process, such as converting his documents into pdf files etc.

The ICT experts taught him how to upload his presentations and how to download files. He learnt how to managed his subject website and how to use the controlled and uncontrolled area of the website.

Although the training was not enough to cover different styles of presenting the different pedagogical methods, it was just enough to assistance him use the subject website.

He plans to attend the different courses offered at CEDIR (Centre of Educational Development and Interactive Resources) and work closely with the ID and the ICT expert within the Faculty of Education.

Expectations

L2 planned to improve his e-Learning environments and create more quality and effective learning resources for his students. He is attending basic ICT training courses at CEDIR with an aim to learn more advanced ICT skills that would enable him to create and manage his own subject website instead of depending on the ID and ICT experts. He has learned the downsides of his first e-Learning environment and plans to create authentic learning activities that will enhance students; learning. He hopes to engage in assisting other lecturers (colleagues).

Reflections

L2 revealed his knowledge and skill level at the beginning of the design process as,

When I first came here four years ago, I could only use a computer and never thought I would get involved in using technology in my teaching. (L2, 28 August, 2003).

He admitted that he was a novice in using ICT in the learning environment, however, getting involved in the project assisted him to realise that learning can be fun, effective and meaningful if lecturers/educators take the time to learn the ICT skills and work with an ICT expert to create e-Learning environment that would suit the needs of their students.

He felt that the planning and designing process was not as tough as he first thought, because the ID and ICT expert were very helpful and they supported him during each stage of the process. Although he did not attend any training program before joining the group, he was able to carry out his role because

instructions were very precise and clear. He commented that experienced IDs understand how novice lecturers feel and they make them feel very comfortable at the commencement of the design process which encourages them to take on their responsibilities without any fear because they know that support will be available.

The whole experience helped L2 to changed his pedagogical methods entirely. He recalled that his work has doubled because he expects students to do more work but he believes that students' learning has improved.

The quality of writing I'm receiving is amazing and students' level of thinking has greatly improved. (L2, 28 August, 2003).

L2 is now confident in using ICT in his teaching and has decided to have all his subjects online. Although his workload has doubled, he plans to keep working at it until he finds a better way of sorting out his problem. He also revealed that he plans to use other multimedia features such as audio in the near future to make his classes interesting.

Lecturer Three (L3)

Background

L3 is a qualified lecturer, has a PhD and has taught more than 20 years at tertiary level. L3 has taught in three (3) different universities within Australia and two other universities overseas and uses the computer only for word processing purposes. She is very familiar with her subject materials and was also looking forward to working with ID1, although she was a bit nervous. She does not use the Internet very often because most of her subjects are taught in a conventional way. She enjoys her classes and said that 'using e-Learning would be a challenge for me'.

Role in the Design process

L3 role was similar to the other two (L1 & L2). She was responsible for arranging her teaching materials in the order of presentation and was expected to prepare the reading resources that would be bound as a book for students. The course co-ordinator also requested that only the latest materials (literature review, conference papers and readings from books) be compiled. She could not compile the reading materials at the commencement of the project because she had another work-related commitment overseas. She informed the group co-ordinator that she would arrange everything and get it all done as soon as she returns from her trip with the hope that everything would be ready as far as her colleagues before the beginning of the session.

L3 arrived quite late and joined the group about a week before the end of the project. She tried her best to search for and arrange her resources but discovered that it was not an easy task. Her role in the project was time-consuming and at the end she decided to just use her old resources. She requested to have a meeting with ID1 and as it turned out, that was the only meeting she had with her

and was asked to submit whatever learning materials she could provide. She did her best and commented at the end of her experience that:

I add a very simple subject website, but I did learn a lot from this experience. (L3, 28 January, 2003).

Planning & Design Method

L3 planned her website during the final week of the project. She took her subject outline and showed ID1 the type of learning activities she employs in her subject. She decided to use some of these activities such as having two major essays and one minor group assignment. She also insisted on having weekly topics for discussion in her e-Learning environment.

She did not plan her e-Learning environment on paper and had no idea on what others were doing with their subjects. To assistance her see the picture of what she was requesting, ID1 actually drew up a diagram on paper to represent L3's ideas and assistance her see the picture of what she was requesting.

L3's e-Learning environment turned out to be the simplest and did not contain as much information as the other two. She stated that her instructions were brief because she did not have the time to add more information, but she was happy with how students used the discussion space. She mentioned that working closely with IDs gives one the opportunity of learning the ICT skills and provides the confidence that is required to plan and design an e-Learning environment that would truly represent their teaching in a face-to-face learning environment. She aimed to keep her assignments very similar to her conventional way of presentation because she did not want to spend a lot of time reading students essays on the computer. She only had a set of marking to do for each of her assignments unlike her colleagues who divided each of theirs into 3 parts.

Experience with ICT

L3 had very little experience with technology. She explained that she was not ready to use ICT in learning, but she had to do it anyway because the course co-ordinator had requested that all subjects in the course must be placed online to cater for distance courses within Australia and overseas. She explained that the only meeting she had with ID1 motivated her to arrange the learning resources for her subject and use ICT with the students.

This experience helped L3 to realise her potential as well as the value and benefit of ICT in the learning environment and as a result she went ahead during the session to attend ICT training courses offered at CEDIR for staff members. She continued to improve her ICT skills with an aim to use them in her teaching. She commented that working with ICT experts and experienced IDs just motivated her to learn the necessary ICT skills to help her guide the students in the e-Learning environment.

Concerns

L3's main concern was her lack of ICT skills and knowledge at the commencement of this study. She was also concerned that she might not be able to assistance students with any technical problems they may encounter during the

course of the study. She was concerned that other lecturers who worked closely with the ID had gained more technical knowledge than she had but expressed the view that her colleagues' tight program hindered them from assisting her. She had to face the difficulty of coping with questions from students concerning their assignments. She also faced difficulties at the beginning, as she was required to sit beside the computer in response to distance students for longer hours but soon got used to it.

L3 was concerned that the presentation of the learning activities in her subject website were very simple. She could not include some other features because she did not have the required skill and there was no time for the ID to assistance as she had other commitments.

L3 began using the e-Learning environment with her students at the beginning of the semester when she realised that students respond positively to the new form of learning. Students' positive attitude motivated her to seek assistance during the semester from ICT experts and the ID in the faculty with technical questions and problems. She did her best to learn about the different ways of designing effective learning activities and began planning more advanced learning resources and activities that would challenge her students in the following semester.

She did experience quite a lot of stress at the beginning but her colleagues were very helpful and supportive and reminded her that they were all in the same boat and will work together until they have the whole course online.

L3 remarked that she would have created a more effective e-Learning environment if she had spent more time with the ID, because she felt that the ID was very understanding and supportive and had answers to all their ICT questions. However, because she started late she had to go through all this stress but at the end, she expressed her appreciation to the course co-ordinator for encouraging each of them to engage in this experience because she learned to use new pedagogical ideas using ICT.

Training Visions & Ambition

L3 had no formal ICT training. She has been using a computer and admitted that she did not know how to use the different functions on the computer. She explained that watching her colleagues pushing ahead to learn more and more ICT skills as soon as their subjects were online, motivated her to do the same and as a result she was the first one to enrol in the ICT training programs offered at CEDIR. She mentioned that attending these courses gave her more confidence to direct her students and to use more advanced pedagogical methods using ICT. The ICT training she received at CEDIR was good but trying to cram in a lot of new technological ideas all at one time was difficult for her as a novice, but she managed to use those ideas after receiving individual reinforcement from the ICT expert and the ID within the faculty.

L3's ambition was to complete all the basic ICT training courses that are offered to staff members at the university in order to improve her skills. She planned to have all her subjects online and use ICT from then onwards.

She spoke to some of her colleagues teaching in other courses within the Faculty of Education and discovered that they also see the value of integrating ICT in their teaching but lack the technical skills. L3 plans to learn as much as she can and improve her skills so she can assist her colleagues to enjoy the benefit of using ICT.

Expectations

L3 is hoping to master the basic ICT skills at the end of the two semesters, then have all her subjects online in the following semester. She still requires a lot of assistance but so far she is quite confident with the ICT techniques she has learned but she is still planning to use both methods of learning (face-to-face & online) in her classes.

Reflections

L3 explained that coping with the technological issues consumed more time and felt that she could not try out any new pedagogical approaches. L3 initially planned to become a good student and to learn as much as she could but after engaging in an overseas assignment she was discouraged and experienced a lot of stress because she knew that time was running out and her colleagues had developed all their learning materials.

Her hopes were brightened up when she realised that the ID was supportive but could not do everything for her because time did not permit them to.

When asked if she was satisfied with the experience, her quick response was, 'O yes, I enjoyed the experience...'; She also commented that she has the confidence and motivation to keep improving her pedagogical methods and learn more ICT skills.

L3 plans to make a lot of changes to her current e-Learning environment but mentioned that she will still require assistance from the ICT expert within the faculty to check her plans before she implements them.

L3 reflected that overall, this experience was a good one because it helped to develop her understandings and skills

Lecturer Four (L4)

Background

L4 was a qualified and experienced teacher who taught at primary level, then moved up to secondary and finally became a lecturer at the tertiary level. She has taught at tertiary level for more than 15 years and has a PhD, with a major in IT. She had a lot of experience in using ICT in learning environments and has developed a lot of subject websites for her classes using Claris HomePage and WebCT.

She was very familiar with integrating ICT in the learning environment and benefited a lot from the values of ICT and wanted other lecturers to also see value and use it to improve their teaching methods. She explained the reasons for collaborating with the ID in this project.

I've co-ordinated the IT subject and because this program is unique as half of the staff are here on campus and the other half, all the methods lecturers are school teachers... There has been a lack of communication between the two groups...therefore it's been very difficult for a sense of a cohesive group running the program...so the idea behind this course website was to build a place where everyone will call home and share their pedagogical methods and resources. (L4, 31 January, 2003).

L4 had built a similar subject website in which she was team teaching with two other lecturers and remarked that after she explained the use of the website to them, they just picked up the idea and ran with it. L4 claimed that:

People were quite happy to learn new ideas as long as they understand the reasons why they had to do things a little bit different. (L4, 31 January, 2003).

Role in the Design process

L4 had experience in developing subject websites and she initiated the idea of developing this whole program (course) website and she explained that her experience in the previous subject website that was used by two other lecturers made communication very easy between them and the students, and she was able to pick up ideas from her colleagues' work and cross link them to her work and her colleagues also did the same.

Developing this new course website was like taking another 'simple little step further' as she describes it. L4 was responsible for planning all the details of the course website and carefully assigned the role of the ID and the type of training that she would provide to the users of the website.

L4 understood very well that most of the teachers in schools would have access to computers but she was prepared to introduce the idea to all of them. She prepared a timetable concerning the commencement date of designing the website, when it should end and the possible training sessions that she would have with both groups of lecturers.

L4 did not work in isolation; she constantly consulted the course co-ordinator and the internal lecturers to get their views on the whole project. She based her plans on the ideas she was receiving from them.

L4 was responsible for explaining her ideas to the ID and the ICT expert whom they both later engaged in the design process. L4 depended on her colleagues to critique her plans and views before she actually cooperated them into the website. Her role involved a lot of thinking, planning and meetings but she was determined to work on it and aimed to make it work successfully.

Planning & Design Method

L4 spent a lot of time planning the different sections of the course website. She had a section for all lecturers to upload their course outlines, a section for major

assignments, another section for announcements, and important events, and a section for resources that students or lecturers thought were useful and wanted to share with others within the course.

L4 stated that planning this course website was very challenging because she had to decide which sections would be controlled by the website master, whether it would be her or someone else, and which section would be free for lecturers (users) to manage themselves.

L4 led the discussion during the first meeting. She took the time to draw her plans on the whiteboard and spent quite a lot of time discussing different options of presenting the learning resources with the ID.

She mentioned that her initial plans on the different sections of the course website changed a lot after discussing and viewing all options with the ID. The development began after they were satisfied with the ideas and then they would call on another ICT expert who was a programmer to assistance out and express his view on them.

The course website was completed within a week then the training section began. L4 discovered during their first meeting that most lecturers had very limited skills in using ICT, so she had to change her training plans and provide basic skills of using the course website only.

L4 did experience some problems along the way. During the first meeting they discovered that different passwords to be created, so they allowed everyone to use the IDs' password during that training session. She realised after two weeks that only a few people uploaded their course outlines and she had to visit lecturers in schools and find out why they were not using the website.

Experience with ICT

L4, as mentioned earlier, was an expert in using ICT for learning. Despite being an expert she commented that embarking on a new project was something very new for her and she needed another ICT expert to support and help her carry out her plans. She remarked:

For me the exciting thing about ID2 coming on board, was having the person to bounce the idea, who was working in the role with other groups and what has been exciting I think for ID2 is, this isn't about one subject or one suite of subjects, this is about a whole program which was quite a challenge for the both of us. (L4, 31 December, 2004).

She expressed the view that having ICT experts working together brings quality to a course/ subject. She realised that it would take most of the lecturers (users) in the course a while to get used to the idea of using the website but stated that she had to be patient and continue urging and encouraging them to see the benefits it would bring to them.

Concerns

L4's main concern was the lack of ICT skills which will make lecturers (users) sit back and not use the course website. She was aware that a lot of time would be

required for training and did not really know how to handle the whole situation as soon as the course website was launched. She explained that the first training turned out well because lecturers had the time to attend her presentation because it occurred during the school holidays. The second training session was poorly attended because school had commenced so many of the lecturers could not make it.

She decided to conduct individual training but it would be time-consuming so she had to plan with another ICT lecturer to support her with this plan.

Her final concern was that she had to leave the faculty and carry out another commitment for one year and she wanted to ensure that L5 who was taking over the responsibility of managing the course website would also carry out the training program for the users.

Training Visions & Ambition

L4 did her best to ensure that each individual realised the benefits and values of ICT. She wanted the lecturers (users) to share their teaching resources among them, so learning would become more challenging for students.

Her ambition was to see that external lecturers for the course knew what was happening in the classrooms at the university, by seeing the assignment, class note and the assessment requirements so they could build on that knowledge and add other authentic and meaningful learning activities.

When asked whether her aim would be achieved in her absence, L4's response was,

I have no doubt that lecturers will learn a lot from this experience because I believe that L5 and the course co-ordinator understand the aim of this website and they will do everything they can to assistance the lecturers. (L4, 29 January, 2003).

She believed that this experience was just an opportunity to introduce the different ways of integrating teaching and learning in the twenty first century. Technology is here to stay and it is our duty to assist novices learn the required ICT skills and use them in the learning environment.

Expectations

L4 wanted all lecturers (users) to be trained so they could manage their own sections in the course website. She expected minor problems, hiccups to occur along the way, whether it would be technical or to do with training. She believed that L5 would be able to sort it out or call on ID2 for support where required.

She wanted lecturers to see that sharing teaching resources, methods and assessment procedures was the best way to go because 'there is no boundary, WebCT had put us into lots of subject compartments' (L4, 29 January, 2003) and in most cases lecturers do not know what the other person is teaching.

This course website is only for first year students so L4 is anticipating that the idea will continue to grow so other levels can be included as soon as L5, the course co-ordinator and the ICT experts have sorted out all their problems.

Reflections

L4 said that she was completely satisfied with the outcome of the course website. She knew that it would not be nearly perfect because it was a new idea that was being tested but she was happy that lecturers responded and saw the opportunity of sharing their resources and ideas with their colleagues.

L4 remarked that; ‘working with teams of people with different points of view, different roles and different professional background, was challenging.’ (L4, 29 January, 2003). She admitted that team collaboration brings quality and satisfaction. She mentioned that one could waste a lot of time on technicality issues and still not solve the problem so working in a team allows the specialist to look at the problem while the person does something more useful.

She reflected on the way she was able to pull staff members to work together as a team on this project and was quite concerned that she was walking away from it at this early stage. However, she was excited that L5 would be taking over the project and believed that he had the skills to train the lecturers (users) and manage the website.

Lecturer One (L5)

Background

L5 is an experienced lecturer who has taught at different levels of education from primary to tertiary and is currently lecturing at the university where the study was conducted. L5 has a Masters in Education and is currently doing his PhD, majoring in IT and teaches IT subjects at the university. The project (course website) that he was engaged in fits beautifully with the focus of his study so that is the reason why he accepted the responsibilities of supporting and training lecturers (users) involved in using the course website.

L5 had experience in using ICT in the learning environment and was prepared to share some of his technical skills and knowledge with the lecturers. He has been involved in developing ICT learning activities for pre-service teachers so he was quite comfortable in managing and running this project.

Role in the Design process

L5 was not involved in the design process; he only stepped in after the course website was launched just before L4 left. His major role was providing technical support and individual training. He stated that running individual training sessions was consuming a lot of his time but he had to do it because that was the best way to provide individual support and prove to each lecturer that assistance was available and that they could do it before he was there for them.

As soon as L5 took over the role, the server crashed and they lost some of the learning activities on the website. L5 explained that after the server crashed, it was disappointing to see that most of the lecturers just set back and did not

attempt to use the website. When asked if he knew the reason why lecturers were not using the website as it was originally planned he responded;

People who actually tried to nibble on it and tried to use it, sort of set back a little bit when the server crashed. (L5, 28, August, 2003).

He re-designed the homepage of the website then spent time showing lecturers he was there for them. He remarked:

I don't think they are looking and seeing the value in it and maybe they are technology wary and I think they haven't spent the time to investigate what value there is in there because a number of them are only using technology because they have too and because their own administrators haven't incorporated them into their teaching as much as they could have. (L5, 28, August, 2003).

L5 mentioned that the changes made on the homepage were another way of trying to personalise it so it will suit their individual subjects, styles and even the taste of the group. The changes also gave students some sort of ownership by including photographs of their work, classroom experiences and having short stories and poems uploaded in the student section. The new sections were controlled and L5 took on the role of screening the materials and linking it for the public to see.

Taking on the responsibility of managing this website means additional work on L5's already heavy work schedule. Despite his heavy workload he was happy to support and train this group of lecturers:

There are methods lecturers out there in schools and are keen to do something with it so there are the goers, they are the active people so what I would like to do is spend more time with them and get them involved. (L5, 28 August, 2003)

Planning & Design Method

L5 changed the homepage of the course website after talking with the course coordinator, ID and both the internal and external lecturers. Most of the website features were left as they were and he only added a few.

He declared that he had never done something like this before but after talking with others he worked with the ID to design the new features and was happy to see that lecturers and students began responding to the new look of the website.

L5 stated that it is always wise to plan out your design then discuss with experts and users of the subject/course website, so you will have their interest and other things will just fall into place, such as willingness to learn ICT skills, etc.

Experience with ICT

L5 specialises in teaching ICT so he had no problems with the technicalities of handling the website and in assisting and supporting the lecturers. He explained that he did call on the ID from time to time when he first joined the group but after a while:

I think the ID has purposely stepped back away from it and she is saying, now I've done my part, I will now let it evolve and see how it goes but there are maybe

some issues where she might come back in and say, can we do such and such...(L5, 28 August, 2003).

L5 was an expert in using ICT in the learning environment but from time to time he would call on the ID and the programmer for assistance.

Concerns

L5 was concerned about providing individual technical support, which consumed more time. There was no other better way of doing it so he decided to stick with this pattern of training until at such time when each one of them would gain their confidence and begin exploring on their own.

He was also concerned about the amount of time spent in editing students' work before it was linked to the website. He commented that another person should take on this responsibility to enable him to only concentrate on the training and management aspect of the website. He realised that external lecturers did not have the same access to technology as internal lecturers so he had to find a way to work around that problem. His remark was:

The support that people have off campus is not the same as what's here. They are interested and they want to use technology but I think there's still need to be more one to one work with those to get them over the hump... then they will say, O, I can do this now, it is not that difficult. (L5, 2 September, 2003)

He commented that lecturers need encouragement to assistance them through. Nothing will stop in integrating ICT in their work as long as they learn the skills and understand what they need to do.

L5 did his best to assist lecturers improve their technical skills and was overwhelmed at the end of the semester to see most of them expressing the values and benefits of learning and sharing they gained out of the course website. Further, most became confident and were prepared to improve their subject resources and use ICT again.

Training Visions & Ambition

L5 was convinced that lecturers who are novices in using ICT should be given basic training as a group before requiring them to participate in such program. He believed that lecturers would be happy to use ICT if they understand its value and how it will support and add creativity in their teaching.

L5 had experience in training pre-service and in-service teachers to use ICT in teaching and mentioned that if he was to be involved in a similar project, he would provide basic training to lecturers as a group either at the beginning or end of the semester to prepare them to carry out their roles more efficiently with less stress. L5 discovered that individual training and support is more effective when lecturers are familiar with ICT, so he emphasised preparing lecturers before getting involved in using ICT.

His ambition was to continue supporting lecturers in the group until they are really confident with their skills. He plans to use this experience to develop more course websites for other levels of education such as second, third and fourth year courses. This is a new initiative which has so far been quite successful. L5

mentioned that planning to improve on such ideas requires more thought on a basic training approach that would not take up a lot of time for lecturers but would have them learn the basic ICT skills.

Expectations

L5 expects lecturers involved in using this course website to continue developing their skills. Some are already showing an interest in improving their skills and uploading almost all learning activities they are using in their subject. Others are interested but require more encouragement from the L5 until they develop their confidence.

L5 expected the ID to lead the project until the end of the semester, but ID2 sat back as soon as she realised that L5 had the knowledge and skills to manage the website. L5 did request assistance from the ID from time to time and was glad that the ID always gave her full support to him. Collaboration from all experts (ICT experts, IDs and lecturers) resulted in a successful program, as they experienced a lot of problems such as the crashing of the server and lecturers not attempting to try the idea for a while.

L5 did not expect that all lecturers would take on the idea and run with it, but at least he wanted to influence and convince the majority and that was exactly how it turned out. L5 was patient and supportive and in the end it paid off.

Reflections

At the end of the project, L5 reflected that this had been a good experience although it brought a lot of challenges to everyone involved. L5 explained that this project had given him a lot of ideas on the type of training approaches that should be given to busy lecturers.

I have come to realise that lecturers are willing to use technology but they need training... they (lecturers) can plan creative learning activities but they require assistance from technical people. (L5, 28 August, 2003).

When asked whether he was satisfied this project, L5 responded:

I think I learned a lot more from this project in one session and I'm really happy that I got involved. I now know the problems that both external and internal lecturers face and I'm able to figure out the type of support they would require. (L5, 28 August, 2003).

L5 explained that he is now in a better position to advice and train pre-service teachers/lecturers as well as novices.

Instructional Designer One (ID1)

Background

ID1 is a qualified and instructional designer who had extensive experience in designing e-Learning environments for tertiary level. She has also directed a few national e-Learning projects for the government as well as companies. She had collaborated with individual lecturers to design their e-learning environment and she is very familiar with the different types of pedagogy and how to use them appropriately.

ID1 has experience in lecturing at tertiary level. She re-wrote the objectives of a diploma course and changed it to a degree level course after teaching the subject for a while. She ran a desktop publishing business which was successful for a number of years then went back to uni to earn her Masters Degree in Business and Information Technology.

She believes that all lecturers would be willing to use ICT and will stick to it if they understand its value and the added benefit it would bring to the students.

ICT can enhance the learning activities and as an ID, it is my job to train and support lecturers to use it. (ID1, 29 August, 2002).

ID1 has been working with different faculties within the university to advise and support them in issues concerning ICT and to work with them in developing their e-Learning environments.

Role in the Design process

ID1 was responsible for directing the lecturers in this project as they developed their individual e-learning environments. Her job was to explain the role of ICT in learning and as most of the lecturers were novices, she had to demonstrate what was already being used in the university and the different types of pedagogies that can be used.

ID1 was very careful, as she wanted the whole group to see the value of ICT during their first meeting and realise that she would always be there for them.

She prepared coffee and refreshment which the lecturers had before the first meeting and this was one way of preparing them to listen to her advice and direction. She explained everything in detail, beginning with her own experience, then explained the role of CEDIR, so lecturers will know that extra ICT support and training can always be obtained from there and that there are specialists and experts available to assistance them out. Finally she introduced the type of support she could give and the role each lecturer is expected to carry out.

The overall picture of the different types of e-Learning environments she described to lecturers made it look simple and put lecturers at ease from their worries about lacking ICT skills during the first meeting. She advised and worked with L1 and L2 and read all learning activities they planned word by word and made comments which they really appreciated.

ID1 ensured that lecturers received the support they required at all times. She did not have the time to provide ICT training to lecturers but knew that an ICT expert was there to support and guide them through. She always responded to their questions and ensured that everyone in the group knew what was happening and reminded them on how much time they had left before the end of the project.

She kept the communication flowing between all participants and ensured that participants were given satisfactory answers to their problems.

She ensured that everyone was creating meaningful learning tasks and kept encouraging them to prepare all the reading materials and get them ready for the semester.

Planning & Design Method

ID1 has been an advisor to similar groups at the university and therefore had the experience to lead these lecturers in the project. She prepared a PowerPoint presentation which included brief but detailed information of everything she planned for the group. She linked all the e-Learning examples to her Power Point presentation which gave lecturers more ideas on what they could do.

ID1 outlined everything very clearly during the first meeting then she drew a timeline on when each role was expected to be completed. She had no doubt that the lecturers would carry out the roles even though they were novices.

I knew that L1 and L2 would succeed because they asked so many questions, which indicated that they were interested. (ID1, 23 December, 2002).

ID1 directed another ICT specialist in her department to design all the e-Learning environments for L1, L2 and L3 who joined them during the final week. ID1 did her very best to provide the required support L3 needed at the very last minute. She (ID1) ensured that each lecturer's resources were assessed and evaluated by her team of ICT experts to ensure that they were good enough for the e-Learning environments.

ID1 in this project was no like a co-ordinator of both the lecturer and the ICT experts. She had the knowledge and skills of designing such learning environments so she was in a better position to direct participants in their roles.

Her main role in this project was to guide and suggest appropriate pedagogical methods to suit the types of learning activities that lecturers were planning. She allowed lecturers to plan their learning resources but only stepped in from time to time when they themselves requested for assistance.

Experience with ICT

ID1 had the experience, knowledge and skills in integrating ICT for learning. She had designed e-Learning environments for lecturers and had even worked collaboratively with individual lecturers/groups in the design process.

She has worked with experienced and professional lecturers who are computer literate as well as professionals who are novices in using ICT. She had worked on research projects for several private companies on the use of ICT in learning and under her leadership, her team successfully designed two government projects on e-Learning.

This project was successful under her leadership because she knew exactly how to pull the team together.

Concerns

ID1 was concerned that lecturers in team one may not be very capable of handling the learning process during the semester. She was mainly concerned about L2 and L3 who expected students to be more involved in discussion.

I was worried about L2 and L3 because they had no experience in using an online discussion space but I cannot stop them. I have reminded them about the courses in CEDIR but if they do not have the time to attend I'm just hoping that all will go well. (ID1, 23 December, 2002).

As it turned out, both L2 and L3 were able to handle the discussions in their e-Learning environments and were prepared to do it all over again.

ID1 was concerned that lecturers may decide to do only certain things and would not attempt to improve their skills. Lecturers did the opposite by the end of the semester; they enjoyed the experience and began making plans on how they would improve their e-Learning environments.

ID1 mentioned that she was concerned about this group because they were all novices and from her experience, she had seen lecturers who were exactly like this group but felt that they did not have the time to learn the ICT skills so they gave up along the way. She said that this group was different maybe because of the situation; they actually had prospective distance students overseas so lecturers worked very hard in the design process then did all they could during the semester to work online with the students. The project turned out to be a real success.

Finally she was concerned about the time limitation she had with the group and as a result she could not provide any ICT training.

Training Visions & Ambition

ID1 commented that novice lecturers should attend the basic ICT courses at CEDIR. She kept emphasising these courses to the lecturers. ID1 wanted lecturers to acquire the basic skills before getting involved in the design process.

She plans to encourage lecturers in all faculties to attend the ICT training course as this is the main way to assistance them gain the skills that would make them design effective learning resources for their students.

Expectations

ID1 expected these lecturers to give up along the way but at the end she was impressed with their determination and how they guided the students in the e-Learning environments.

She expects all of them (L1, L2 and L3) to become experts and have all their subjects online in the very near future. She still expects them to ring her up or email her from time to time with ICT questions but for the time being, she has left them alone to go through the experience and figure out what and how to solve their problems using the basic skills they have learned.

Reflections

ID1 mentioned that she had doubt at the beginning of the project, that she was not really convinced that the lecturers would successfully carry out their roles. After the first meeting, she claims that it became clear that the lecturers (L1 and L2) were prepared to work and learn the basic skills. She knew that it would be a challenge for them but she was willing to work and support them along.

She concluded that lecturers can do a better job even though they have very limited skills, as long as they know that support will be provided and that they understand their role and how to use the technology, they will be successful. She affirmed that having a good rapport with lecturers brings positive results in their work and assistances them to realise their potential and work towards developing it.

Instructional Designer Two (ID2)

Background

ID2 is an experienced and professional instructional designer who has worked with two private organizations and had developed quite a number of educational projects for TAFE as well as tertiary level subjects. She explained that in her previous role, she would be given heaps of teaching materials in big folders and was required to turn those into online learning materials. Sometimes she would call the teachers and ask them to explain how they wanted the materials to be presented—especially with subjects which she was not familiar with.

In most of the projects she collaborated with other ICT specialists as a team to develop e-Learning resources. She recalled an experience where teachers were given desks right in the design room, so they worked side-by-side throughout the design process.

ID2 has always worked with others as a team but mentioned that this project was quite different because the lecturer was an expert in using ICT so the discussion between them was at a much higher level, making her job much easier.

She had a degree in Information Technology and Communications and knew her job quite well.

Role in the Design process

ID2 remarked:

My job is to work with lecturers in the faculty to create e-Learning environments upon their request. I suppose my role might be a bit different depending on whether I'm working with somebody who already has some expertise in using ICT or a novice who needs all the support and assistance I can give. (ID2, 28 August, 2002).

ID2 stated that her role in this project was to evaluate the different features planned for the course website before actually designing it. Her remark:

I suppose my first approach was to immerse myself in the material, in the content, in the learning context and I tried to find as much as I can about L4's plans... I tried to understand the process through a series of discussions. (ID2, 28 August, 2002).

She supported both L4 and L5 in training the lecturers who had to use the course website. She attended the group training programs that were run for lecturers (users) but stepped back when L5 began providing individual ICT training.

Planning & Design Method

ID2 spent a lot of time discussing, revising and refining L4's plan for the course website. She created a storyboard from the diagram L4 drew on the whiteboard that illustrated the different features she planned to have on the course website. Creating the storyboard assisted her to see the picture in her own mind and how she would design it for L4 and the lecturers.

Planning the e-Learning environment in this case was different because ID2 had to receive instructions from L4 and design most of the features according to her plans. ID2 called on a programmer for support during the design process, because the particular feature L4 was requesting needed someone with programming knowledge.

ID2 claimed that collaborating with an expert in using ICT makes the design process easier to handle.

ID2 designed a course website which incorporated some features from WebCT and

Experience with ICT

ID2 had the experience to design e-learning environments for teachers at different levels of education. She had collaborated with other ICT experts in designing educational projects and knew how to communicate and assist team members understand the role they had to carry out in the design process.

Because of her vast experience in designing e-Learning environments and teamwork, she did everything within a short period of time and commented that it was the best team work she has ever done.

Concerns

ID2 was concerned about the users (lecturers) of the course website. Most of them were novices in using ICT in learning and they lacked the skills and confidence to use the course website. She wanted L5 to continue providing individual assistance at the end of the semester because that was the only way to support each of the lecturers (users).

She wanted lecturers to see the value of the course website and how they would benefit so their experience could be an example for other courses within the faculty.

Training Visions & Ambition

ID2 had the time to provide training to L5 in certain technological areas. She mentioned that part of her role, as the ID for the faculty was to ensure that lecturers received training in using ICT in their teaching.

She had been working with several groups of lecturers within the faculty but despite her busy program she had the time to provide training. As such she took time to join L4 to provide basic training to lecturers (users) then joined L5 again to provide more training to the same group of people.

ID2 explained that most lecturers are technology-literate but they lack the confidence and support to help them use ICT in their teaching. Her ambition is to encourage and urge individual lecturers to design at least a simple e-Learning environment for their subject or improve the ones they already have and use it because that is the only way they will discover their needs and work with her to resolve those needs.

Expectations

As the person responsible for instruction design matters for the faculty, ID2 was keen to provide all the support, advice and assistance she could to lecturers within the faculty. She knew that quite a number of subjects had been hosted online but not everyone was able to use such a learning method.

She hopes that her effort of supporting and assisting lecturers will pay off and lecturers will be able to use more challenging pedagogical methods that will make learning more student-centred.

Reflections

The team collaboration process was a real success. L4 knew exactly what she wanted on the course website and planned everything out which made the design process very easy.

The server crashed two weeks after launching the course website and as a result most of the lecturers just sat back and did not make any attempt to use it again. ID2 became concerned but worked closely with L5 to change the homepage of the website and explained to lecturers the new features they had to use, and that convinced them that support was available and they began using it again.

The individual training that was offered by L5 was time-consuming but very helpful to the lecturers. ID2 wished to assist L5 but due to her busy program she could not do that, but plans to encourage other experienced ICT users (lecturers) within the faculty to support their colleagues where they can.