Technology adoption

Voices of teaching academics, educational designers and students

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Thesis submitted to fulfil requirements for a degree of
Doctor of Philosophy

Faculty of Education
Deakin University, Australia
November 2005
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**Technology adoption: Voices of teaching academics, educational designers and students**

Submitted for the degree of

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Abstract

This folio presents three studies (a dissertation and two electives) which use qualitative case study methodologies to investigate technology adoption from three perspectives. Central to all three studies is the study context of Monash University.

The Dissertation explores adoption of web-based learning and teaching approaches from the perspective of teaching academics as they incorporate these to facilitate their students’ learning. The study investigates teaching academics’ reasons for adopting these new technologies, the factors that influenced their adoption decisions, and the challenges they were confronted with, including the contributing factors that impacted on their adoption decisions. The study shows that while contextual factors such as power and politics of the school, department, faculty and the institution impact on adoption, supportive organisational infrastructures and policy frameworks are necessary to encourage adoption, including wider adoption. In turn, on going staff development, adoption of new work practices and being adaptive to changing work environments are key demands made on teaching academics as a result of adopting web-based teaching approaches.

Elective 1, a smaller study, leads on from the dissertation and examines the impact of technology adoption on the evolving role of educational designers. The study identifies the educational designers’ role change in assisting teaching academics to move from more conventional forms of teaching to more technology based learner-centred collaborative models. An important aspect of the study is the managers’ perspectives of this role in a university that has adopted a strong flexible learning and technology policy. The findings show that educational designers now work as project managers in larger teams consisting of a wider range of professionals, their expanded role in introducing technology into learning designs, providing staff development in the area, and giving technical help including advice on copyright and intellectual property issues.

Elective 2 explores student readiness to adopt these technologies for learning. The study is designed to achieve an understanding of three broad categories of learners from a first year design unit: (1) South East Asian and East Asian students, (2) all other international
students, and (3) local Australian students are studied to examine their readiness for modes of learning that are flexible; their approaches to study in a creative discipline area; and their openness to using technology. Findings of the study are discussed under the key themes – dependence on the teacher and classroom environment, flexible learning and working alone, structure, communication and work patterns. The study concludes by discussing the possible cultural attributes that have an impact on the learning.

The three studies found that the institution, its people, structures and processes must all adapt, evolve and grow in order to provide effective, engaging, student-centred web-based learning environments. Students in turn must be enabled to manage their study, make use of the technologies and maximise their learning experience. The findings revealed the stage of technology use reached at Monash University at the time of the study through the voices of the teaching academics, educational designers and students.
Acknowledgements

This work would not have been possible without contributions from several groups of people at Monash University, Australia who were generous with their time and shared their views through interviews. I am thankful to the teaching academics, educational designers, managers and students who participated in my investigations, and I acknowledge this debt with gratitude.

Of the many who gave freely of their time and expertise, I am thankful to Professor Chris Bigum whose questions and incisive comments helped clarify the use of actor-network theory adopted in this work, and to Dr Robyn Benson who played the role of a critical friend and so willingly reviewed the draft thesis.

I thank Dr Peter J Smith, my associate supervisor, for his direction and advice, particularly with regard to Elective 2, and his feedback on the draft thesis.

I am very grateful to Associate Professor Elizabeth A Stacey for navigating me through ‘the doctoral experience’. I thank her for her inspiration, patient guidance, constant encouragement and for challenging me to strive for excellence.

Thank you, all.

Gayani Samarakkremar

Melbourne, November 2005
Dedication

This work is dedicated with love to my family, for their faith and support of my efforts.
Chapter One  Overview of the folio

**Introduction**

Web-based education using sophisticated electronic technologies has changed and is continuing to change the way learning and teaching are carried out in most universities in the developed world. The three studies in this folio are placed against this background of change within the context of a large Australian higher education institution.

The aim of this chapter is to provide a general overview of this folio which consists of one large study referred to as the Dissertation and two smaller studies referred to as Electives 1 and 2. This chapter also describes the underlying methodological paradigm which is common to all three studies.

**Rationale**

The Doctor of Philosophy degree by folio requires the completion of several projects that demonstrate research skills and feed back into the researcher’s professional work. Consequently, the three studies described in this folio are situated in the researcher’s own work environment and are directly related to the researcher’s practice. The three studies arose as a result of the researcher’s work as an educational designer at Monash University, Australia.

The Dissertation explores factors that impact on the adoption of web-based learning and teaching approaches by teaching academics. As a result of technology adoption in higher education, new roles have been identified for both teaching academics as well as educational designers (Collis & Moonen, 2001). Elective 1 follows on from the Dissertation and is about the evolving role of the educational designer resulting from increased technology use in universities. Elective 2 examines a first year design class to identify students’ approaches to, and preferences for, flexible study. This study was undertaken to inform the practice of the educational designer.
Context of this folio

These three studies were conducted at Monash University, Australia, a large multi-campus institution with a student enrolment of nearly 52000 and about 2800 teaching staff (Monash University, 2004a). This institution has been a dual mode higher education provider since the 1980s (Moodie & Nation, 1993), with all its ten faculties offering courses through flexible modes of study. This context is described in detail in Chapter Six.

The three studies in the folio

Brief overviews of the three studies follow.

Dissertation – Adoption of web-based learning and teaching: Voices of the teaching academics

The dissertation explores the adoption of web-based learning and teaching approaches from the perspective of teaching academics. The introduction of learning management systems and other web-based technologies in higher education institutions has required university teachers to incorporate these to facilitate student learning. This study explores the teaching academics’ reasons for adopting these new technologies and the factors that influenced their adoption decisions. It explores the challenges teaching academics are confronted with, including the contributing factors that impact on their adoption decisions.

Elective 1 leads on from the dissertation. While university teachers make the transition to working online and adopting technology for teaching and learning, the academic support service provided to teaching academics by educational designers has adapted significantly to suit the increased use of electronic media including web-based technologies, which is the theme explored in Elective 1.

Elective 1 – Online learning and the evolving role of the educational designer: Voices of the educational designers

This elective focuses on the impact of technology on the evolving role of the educational designer. As a consequence of teaching academics adopting web-based approaches to
facilitate learning, the role and functions of the educational designer have changed and continue to change. Central to this evolving role of educational designers is the educational designers’ response to assisting academics in moving from conventional forms of teaching and learning to more technology-based learner-centred collaborative models. An important aspect of the study is the managers’ perspective of this role in a university that has adopted a strong flexible learning and technology policy. This elective focuses on the demands on and expectations of the educational designer role at Monash University resulting from technology adoption in learning and teaching.

While the dissertation and Elective 1 investigate technology adoption issues relating to teaching academics, and the educational designers’ response to greater use of learning technologies in the University, students’ readiness to adopt these technologies for learning and to accomplish their study in these technology-rich learning environments is explored in Elective 2.

Elective 2 – Client diversity: Voices of the students

This study directly informs the practice of educational designers. Changes in higher education in Australia have resulted in institutions needing to service an increased number of students with a range of backgrounds (educational, cultural, language, etc). Teaching academics and educational designers alike are faced with recognising varying aspirations and expectations and servicing the diverse client groups. Elective 2 explores this issue in relation to a group of first year students studying a design unit.

The study was designed to achieve an understanding of three broad categories of learners: (1) South East Asian and East Asian students, (2) all other international students, and (3) local Australian students in terms of their readiness for modes of learning that are flexible; their approaches to study in a creative discipline area; and their openness to using technology.

The study also explores the special requirements of all these categories and aims to extend the understanding of South East and East Asian learners who pursue design as a discipline. In contrast to the dissertation and Elective 1, this study was conducted in an environment where no online technology has been used to deliver the learning.
Theoretical basis

A review of the literature assisted in informing the design of a methodology to suit the research questions examined in this folio. The research questions also helped to identify the most appropriate data collection strategies to answer those questions. The theoretical framework to analyse those research questions also stemmed from this review of the literature and determined the methodology. The theoretical and methodological paradigm selected is common to all three studies in this folio and is therefore described in this overview chapter of the folio.

Methodological paradigms

Social scientists have an array of methodological choices available to them to frame and conduct their research though traditionally there are three methodological inquiry paradigms for researchers to follow – the logical-positivist-quantitative paradigm, the interpretive-naturalistic-constructivist paradigm, and the critical theory paradigm. The eclectic-mixed method paradigm is a fourth paradigm that draws from the other three. These are outlined below.

Logical-positivist-quantitative paradigm

This paradigm assumes that the world is a single, tangible and fragmentable reality and that truth is context-free and generalisable. Its attributes or variables can be manipulated and the inquirer is independent, objective and detached in order to be able to provide a neutral insight into study questions that often employ quantitative methods for data collection (Guba & Lincoln, 1982). Detachment from what is studied is maintained in order to be objective, while mathematical and statistical significance is held in high regard (Reeves & Hedberg, 2003). Most early educational research followed this positivist scientific approach which has value especially in the physical sciences (Burns, 2000) and is appropriate for hypothesising and generalisation.

Interpretive-naturalistic-constructivist paradigm

The interpretive or naturalistic paradigm assumes that there are multiple realities that are meaningful and interrelated and that the study of one part influences all other parts
In most cases, the inquirer and the respondent are interrelated and the individual cannot be disentangled from the activity being observed when making constructions, and is a part of the whole. Social/behavioural phenomena are seen as existing in people’s minds and consequently there are as many realities as there are individuals. Therefore, it is only sensible to view reality as a whole and not in portions. This paradigm also assumes that generalisations are not possible because there are no enduring truths that are also context-free (Guba, 1981).

Constructivist methodologies are guided by the subject matter itself. Constructivists believe that objective knowledge and truth are created by individuals. This approach was originally described by Lincoln and Guba (1985) as naturalistic inquiry, though they subsequently began to use the term constructivism to describe their methodology (Guba, 1990). Reality is social, and multiple constructions of knowledge are derived from the group of people in a given situation (Kayrooz & Trevitt, 2005; LeCompte, 1990). Knowledge is therefore a reconstruction of the subjective beliefs and understandings of participants in a given context which makes that knowledge time and place specific. Interpretivist knowledge, described as a ‘working hypothesis’ is emic knowledge which is embedded in the context of those studied. Also, it is accepted that facts are value-laden and that inquiry is not value-free. Knowledge is also value-bound and therefore is meaningful because it is situated within local and political realities (Green, 1990). For authentic portrayal of human life and interactions, knowledge that is particular and specific is as important as knowledge that is holistic and about the larger group (LeCompte, 1990). Constructions are a result of making sense of, or interpreting experience. The quality of the construction depends on the range and scope of information available and the constructors’ sophistication to deal with the information. Constructions are usually shared, are meaningful and can be judged only with reference to the context within which they are framed (Guba, 1990). The context is therefore seen as very much a part of human behaviour, and shapes the interpretations of the findings of a study using this approach (Reeves & Hedberg, 2003). Statical and mathematical approaches of analysis are rejected in this approach in favour of observational and interview methods.
Critical theory paradigm
According to critical theory, individual understanding is shaped by culture and social structure, though the interpretive framework of studies using the critical theory paradigm is still based on the way individuals construct meaning (Foley, 2000). It places emphasis on the social context, and the interrelationship of knowledge, power and ideology. The main modes of inquiry among critical theorists are criticism and deconstruction founded in skepticism and questioning (Reeves & Hedberg, 2003).

Eclectic-mixed methods paradigm
In order to handle complexities in inquiry, this paradigm is open to borrowing approaches from other paradigms to collect information. The ‘mixed methods’ approach recognises that aspects from multiple perspectives are necessary to triangulate information and it therefore has a practical orientation (Reeves & Hedberg, 2003). A range of tools are used in order to understand a problem and, consequently, no tool is considered to have greater or lesser value than another.

The naturalistic approach and the studies in this folio
The approach for addressing the three study questions in this folio was determined by selecting the paradigm that best fitted the phenomena under study. The utility and the strengths of the interpretive-naturalistic-constructivist paradigm for studying social/behavioural phenomena were obvious. It is therefore the overarching paradigm for all the three studies in this folio as it accommodates interrelated multiple realities. ‘Finding a paradigm that can tolerate real world conditions surely makes more sense than manipulating those conditions to meet the arbitrary design requirements of a paradigm’ (Guba & Lincoln, 1982, p. 234).

The world of lived reality and situation or context-specific meanings constitutes the general object of all three studies in this folio. These situations are thought to be constructed by social actors (Schwandt, 1994), and therefore a constructivist or interpretivist approach is adopted to interpret the meaning of the social interactions as they are lived and felt by the participants. Lincoln and Guba’s (1985) constructivist
stand was critiqued by Schwandt (1994) as being idealistic because of their assumption that reality is a construction in the mind of the individual.

As explained earlier, the three studies in this folio are placed in the field of naturalistic inquiry and are considered through a constructivist interpretive paradigm that has gained considerable significance through the contributions of Guba and Lincoln (Guba & Lincoln, 1982, 1999; Lincoln & Guba, 1985).

Reports of investigations carried out in this mode often take the form of case studies or ‘portrayals’ (Guba, 1981). All three studies in this folio draw on tacit knowledge, feeling and intuitions as data. The studies accommodate unfolding multiple realities through the interactions of the researcher with each of the respondent groups, in a real world setting.

In order to establish dependability, the data in all three studies were organised, managed and analysed using NVivo® software designed for qualitative analysis (Bazeley & Richards, 2000). NVivo® establishes an audit trail useful for an auditor to examine the process of how the data were organised and analysed, and how interpretations were determined. The audit trail is also useful to anyone who desires to replicate the study.

According to Stake and Trubull (1982), naturalistic inquiry accommodates the improvement of one’s practice and facilitates effecting change as it provides good, fine grained information. It also makes improvement and change possible by expanding experience through re-examining problems, conditions and possible solutions as well as relying on experiences of other practitioners through connecting with and drawing from them. The fact that naturalistic inquiry provides for facilitating change and improving practice in these three ways made it a suitable research approach for these three studies.

Themes and ideas that emerged during the research process in these studies needed to result in an improved understanding of technology in higher educational settings. According to Watkins (1986), constructivist theory and its concepts are useful in exploring and reflecting the social and cultural impacts on approaches to learning. He also pointed out that educationists should prompt the consideration of basic questions regarding how and why certain technologies are being used in a particular way.
Constructivist approaches are used in this folio to provide a framework to answer the questions under investigation through the views of the respondents. The case study approach as against sample research was selected as a suitable methodology for all three studies in this folio. The reasons for its selection are explained in the following subsection.

**Case study approach**

The goal in all three studies was to understand the selected cases. The view that ‘[c]ase study is not a methodological choice but a choice of object to be studied’ (Stake, 1994, p. 236) holds for all three studies. Kayrooz and Trevitt (2005) recognised that the context, research approach and methods are intertwined in case studies. Similarly, the three research contexts in this folio had an effect on, and influenced the decisions related to the research design, purpose and selected research methods. The case study approach was selected to investigate the three studies because it

- is holistic in its method;
- enables the study of people engaged in real-life activities, unlike an experimental situation which is an artificial construction of life (Orum, Feagin, & Sjoberg, 1991);
- permits the researcher to examine the complexities of life and its interactions and insights into human motivations; and
- helps in theory generation by suggesting new interpretations and concepts.

The two electives in this folio are case studies where the case was preselected. The two selected cases were of interest not to learn about a general problem, but because of the need to learn about particular problems and because a better understanding was needed in those particular cases. This idea is confirmed by Stake (1995) who was convinced that ‘the real business of case study is particularisation, not generalisation’. The cases in the two electives were not undertaken because the cases represent other cases (Stake, 1994) but because of intrinsic interest in studying educational designers (Elective 1), and first year design students (Elective 2) in a particular context.
In contrast, the dissertation draws from several individual participants or cases to understand a larger case. The many participants or small cases contribute to understanding a single individual case which is the institution. This investigation can also be described as a multi-site qualitative study (Harriott & Firestone, 1983). Each individual participant contributes to a greater understanding of the case under study. In this study, selected teaching academics representing all the faculties are the individual cases which are instrumental in informing and understanding the adoption of web-based learning and teaching approaches across Monash University.

In the dissertation a selected group of participants is used to gain insight into a larger issue. In a sense, this study also has features of the collective case study where a number of participants or cases have been jointly studied in order to inquire into a general condition or phenomenon (Stake, 1994). The participants are selected to further the understanding of the larger issue under investigation. Though the participants may appear as cases that play a supportive role, they are studied only to the extent that they provide insight into the context and complexities of the case under study which is the adoption of web-based learning and teaching at Monash University. Several participants are studied in order to maintain reliability, and the same phenomena are studied during the same time period. This satisfies the need for an intersubjective and comparative basis for observation and ensures that study will be roughly identical across all participants (Orum et al., 1991), permitting comparative research and the discovery of patterns as well as identifying how patterns may differ. The participants were selected with the expectation that they would further understanding of the challenges teaching academics are confronted with when online/e-learning technology is introduced to facilitate learning and teaching.

The general approach to the research in all three studies is to learn from experience. The researcher comes to know through the encounter. Validity is maintained through the use of a variety of data sources (e.g., interviews, supporting documents, field notes) which are called upon to assess views and motives in order to cross-check and validate. By asking several people the same in-depth questions and by checking with other data sources, validity is maintained across all three studies.
## Limitations of the research

The main limitation of the three studies in this folio is that they are all conducted within Monash University which makes the findings from the three studies institution specific. Also by selecting an interpretive-naturalistic-constructivist paradigm as the overarching paradigm of inquiry in the three studies, the possibility of generalising findings to other situations is limited.

## The researcher's role

Since qualitative case study embodies interpretive research, the role of the researcher as the primary data collector and the researcher’s personal values and assumptions are important. It must be noted that the three studies in this folio are a result of sustained and intensive involvement of the researcher with the case, as an employee of the University.

Gaining entry to the research site was made possible by employment in the context that was investigated. As an ‘insider’ and an ‘internal researcher’, the researcher was at an advantage, having inside knowledge of the institution, its people, its problems and issues. The researcher also had the advantage of previously established rapport and trust. However, institutional procedures were followed with formal ethical permission to conduct research obtained. This ensured that the integrity of the research was maintained and balanced with the researcher’s identity as an insider.

The researcher’s contribution to the research setting includes her perceptions of technology use in higher education which have been shaped by personal experience of working as an educational designer in this context from June 1997. Although this brings certain biases to the study, every effort (as explained in the research procedure in Chapter Five) has been made to identify and reduce them. However, they may still shape the way the data is understood and interpreted.

While all university employees, including educational designers need to keep learners who are the main customers satisfied, as Morrison (2003) pointed out, students are not the only stakeholders, and management needs and expectations must be considered. The
findings of the three studies relate back to, and offer the potential to improve the understandings of the University’s management.

**Folio structure**

The three studies in this folio are presented in the following chapters:

Chapter One – This chapter provides an overview of the folio, introduces the three studies and the three structured parts of the folio.

Chapters Two to Ten – These chapters encompass the dissertation, *Adoption of web-based learning and teaching: Voices of the teaching academics*, and describe the adoption of web-based learning and teaching at Monash University. This study forms the bulk of the folio with chapters dedicated to reviewing the literature, analysing the theoretical framework, setting out the methodology, describing the results and findings and, finally, discussing those findings.

Chapter Eleven – Elective 1: *Online learning and the evolving role of the educational designer: Voices of the educational designers* explores the increased use of technology in learning and changes on the role of the educational designer, caused by web-based approaches to teaching and learning. This study extends the understandings about the identity of the educational designer.

Chapter Twelve – Elective 2: *Client diversity: Voices of the student* explores learner readiness for flexible learning among a group of first-year design students on the basis that educational designers and teaching academics have to be more aware of diverse student groups and their needs, and be ready to service those needs. The results of this study were published under the title ‘Determinants of student readiness for flexible learning: Some preliminary findings’ in *Distance Education* (2005) Volume 26 Number 1, pp 49-66, and this article is included in this chapter.

Chapter Thirteen – This chapter is the final chapter of the folio and draws together conclusions from the three studies.
Summary

This overview chapter has provided the rationale for this folio and briefly outlined the three studies that make up the folio. The chapter has also provided a detailed account of the overarching methodological paradigm that is common to the three studies and has concluded by describing the researcher’s role.

The next nine chapters (Chapters Two – Ten) of this folio form the dissertation.
Dissertation - Adoption of web-based learning and teaching:
Voices of the teaching academics
Chapter Two  Overview of the dissertation and origins of the research

Introduction

Information technology is no longer the novelty it was a number of years ago and computers are now standard equipment in higher education institutions, particularly in the developed world. Integrating computer technologies into the teaching and learning transaction is changing traditional approaches to teaching.

This study describes the adoption of web-based learning and teaching approaches by a group of teaching academics in a higher education setting. It investigates the motivations for change, contributing and influencing factors, and the new roles, tasks and approaches adopted by teaching academics as a result of extending their traditional role to include web-based teaching. The study also records their reactions, concerns, and strategies, and the institutional context they operate within.

While the previous chapter provided an overview to the whole folio, the purpose of this chapter is to provide an introduction to and an overview of the dissertation in this folio.

Concerns that led to the study

Innovation in universities does not occur at an even pace and is influenced by many factors. Even across one university, the uptake of something new is uneven. This calls for a better understanding of such situations.

This investigation grew out of a perceived need to understand teaching academics who adopt web-based teaching, including their motivations and the conditions that influence those motivations. The study was designed to evaluate and understand how well these teaching academics (as innovators and early adopters of web-based technologies) made such new approaches work. Increasing understanding of the motivations and the conditions that facilitate the growing number of teaching academics who adopt these
technologies will be helpful in identifying institutional factors that enable technology adoption. This information is also important in order to understand the still significant group of teaching academics who are reluctant to adopt and employ these approaches in their teaching.

**Purpose of the study**

The investigation grew out of a perceived need to broaden the base of evidence about factors that influence teaching academics to adopt web-based teaching. The significance of the study lies both in its focus and its methodology. The study is a qualitative analysis of how twenty-two participants across ten faculties adopted online learning and teaching approaches. Results are generated through practitioners’ knowledge and experience of local problems and situations.

It is hoped that this study which records local knowledge of professional practice will inform higher education institutions about how teachers in a given context take to teaching with technology and what institutional reactions might assist such change. By offering the teaching academics’ viewpoint, it is envisaged that the study could potentially help institutions identify areas of assistance needed to facilitate stress-free and smoother adoption of technology.

**The research proposition**

Most universities are faced with competitive pressure to adopt flexible learning and teaching. Many are responding by adopting web-based learning systems and have invested in learning management systems (LMS) such as WebCT Campus Edition®, WebCT Vista®, TopClass®, and Blackboard®, to name a few. In some situations, the system has been adopted by the institution while in others, the simplicity of the system has resulted in a small number of teaching academics adopting it without institutional support and encouragement. Many teaching academics are experimenting with presenting their learning materials in some form or other, using such learning management systems. Others who have experimented with these web-based
technologies are now seeking to exploit the findings in a meaningful way – which is not only innovative but also promotes learning and teaching.

WebCT® is one of the more commonly used learning management systems in Australian higher education institutions, and in 2002 was adopted as the selected learning management system at Monash University (Weaver, Button & Gilding, 2002), where this study took place. The University’s institutional policy is to be flexible, global and innovative, and the use of technology for learning and teaching, therefore, is an expectation.

Given that higher education settings are increasingly adopting web-based technology, it is necessary to investigate this from a microcosmic level – from the individual teaching academic’s perspective and from the individual institution’s perspective.

Consequently, the current study was established to investigate the following question –

- What influenced the decision to adopt web-based learning and teaching approaches?

In exploring issues related to this question, answers to other questions were also sought. These questions were –

- How did the context influence the decisions to adopt?
- What learning and teaching approaches do teaching academics use?
- What conditions stabilised the adoption of web-based learning and teaching?
- What can be learned about strategies necessary to implement web-based learning and teaching?

Terms used in this study

Web-based learning and teaching is a rapidly evolving area and is therefore hard to describe. In the current study the term is used to describe a collection of technologies, products, services and processes. It includes learning and teaching conducted both
synchronously and asynchronously at varying levels of complexity over the internet which may or may not use a learning management system, but may use stand alone software, programs on client server networks, or intranets. The term in this study also includes use of ‘web-enhanced’ (Belanger & Jordan, 2000, p. 52) hybrids such as CD ROMs, supporting streaming media, content libraries, assessment tools and collaboration tools as well as complementary print materials and face-to-face classroom sessions related to web-based learning and teaching.

Thus, the term web-based learning and teaching is interpreted in a broad way. However, in reviewing the literature and in describing or referring to work done by other authors, the terms used by those authors are retained in order to maintain the authenticity of their ideas.

While some studies are specific in their use of the terms, many authors use the terms ‘technology’, ‘new technology’, ‘educational technology’, ‘learning technology’ to mean a combination of telecommunication technologies and internet and web technologies. Authors also use terms such as ‘e-learning’, ‘online learning’ and ‘virtual learning’, among others. While the term ‘technology’ may have connotations of hardware, learning technology is more than just hardware and software but also includes resources intended for learning, self-guided or otherwise, which are designed to address a learning need. Also associated with technology use is the connotation that it facilitates flexibility and a degree of independence in the user.

**Teaching academic** is used in this study to describe the university teacher who teaches a group of students either face-to-face or off-campus using printed materials or web-based technologies. While members of this group are also described as ‘academics’ or ‘lecturers’, some North American studies describe them as ‘faculty’, ‘instructors’ or ‘tutors’. In the institution within which the current study took place, academic staff include non-teaching academics such as educational designers, evaluation specialists and curriculum designers. In order to differentiate between these two groups, the term ‘teaching academic’ is used in this study.
Chapter Two – Overview of the dissertation and origins of the research

Theoretical perspective of the study

As explained in the previous chapter, this study is driven by an interpretive naturalistic inquiry approach. Therefore, this is a qualitative case study designed to provide the required rich descriptions of the context under investigation.

This dissertation contributes to knowledge by providing evidence of how teaching academics adopt and integrate technology for teaching and learning in higher education. It was originally framed by Rogers’ theory of diffusion of innovation (Rogers, 2003). The study, to some extent, corroborates Rogers’ theoretical framework but finds it inadequate and draws on actor-network theory to accommodate and describe the socio-political aspects and contextual factors that contribute to adoption, and uses the latter theory as an interpretive lens. The two frameworks are used together to capture the fine detail that is required of a case study.

Limitations of the study

This is an exploratory investigation undertaken to improve the understanding of a specific issue at Monash University. Although this study has made progress in answering the research question, the results should be interpreted with an awareness of the following issues.

One limitation of the present study is its sample selection which relied entirely on volunteers to participate. It is possible that some of these persons may have predispositions to using web-based learning and teaching approaches which may have had an effect on the results. However, it could be argued that those who participated had an in depth understanding of both the positive and negative aspects of adopting web-based learning and teaching approaches and were experienced and knowledgeable and thus able to comment on and contribute to this study.

This study was designed to investigate a problem at Monash University which raises issues related to transferability. It is therefore not appropriate to generalise these findings to a larger and potentially dissimilar group. However, through the rich description of issues, the researcher has endeavoured to show that a similar problem could exist in
other similar higher education institutions. This gives the reader useful background knowledge to make judgements on transferability. If the findings are relevant locally, nationally or even internationally, and if findings are to be applied elsewhere in other situations, questions such as

- What is relevant for me in this study?
- What aspects of the study are relevant to my circumstances? and
- Do I agree with the rationale?

must be asked. Finally, it is up to the individual reader to decide what and how much can be transferred. Transferring the findings to other higher education situations must be done with care.

**Structure of the dissertation**

As stated previously, the dissertation consists of Chapters Two to Ten of this folio. The chapters are structured as follows:

Chapter Two (the current chapter) presents a summary of this dissertation by providing the rationale, an overview of the research question(s) and the broad context of the study.

Chapter Three reviews the relevant literature related to technology and learning and teaching in higher education institutions. In reviewing the forces that drive technology adoption, it also considers the impact of technology adoption on teaching academics and the conditions that facilitate adoption in higher education institutions.

Chapter Four specifically focuses on technology adoption and the research literature relevant to the current study. It examines Rogers’ theoretical framework of diffusion of innovation (Rogers, 2003) and other theorists who extended this theory. The chapter also describes actor-network theory and its key concepts.

Chapter Five describes the theoretical framework and the methodology of the study in the context of the literature that was reviewed in the two previous chapters. The chapter also explains the aspects of the theory of diffusion of innovation and actor-network
theory that will be used for interpretation of the results. Methods of data collection and
the process of interrogating that data are also presented in this chapter.

Chapter Six describes the context in which the study takes place. Since context is
important in case study research, this brief chapter provides a description of Monash
University which is the institutional context in which the investigation took place.

Chapter Seven examines the approaches to web-based learning and teaching adoption by
twenty-two participants in the study and draws on the extended diffusion of innovation
theory to present the findings.

Chapter Eight examines the contextual factors related to adoption of web-based learning
and teaching by the twenty-two participants. The challenges, successes, failures and
frustrations that impacted on the participants’ adoption of web-based learning and
teaching are presented in this chapter. These findings are interpreted using actor-network
theory.

Chapter Nine reflects on the implications and contribution of the investigation and
discusses the main findings. Central to this discussion are key aspects that may be
addressed in order to improve the adoption of web-based learning and teaching.

Chapter Ten provides the conclusion of the investigation in relation to the study
questions. Reflections on the significance of the findings are also discussed in this
chapter. The chapter closes with recommendations for further study.

Chapter Thirteen links the dissertation findings and conclusions with the conclusions of
the two electives.

Summary

The purpose of this chapter was to provide an initial overview of the dissertation.
Consequently, the concerns that led to the study, the main research question(s), the terms
used, the theoretical perspective, and the limitations of the study were described. The
chapter concluded with an outline of each of the chapters that make up the dissertation.
The following chapter, Chapter Three, will review the literature that is related to technology and higher education, institutional strategies for adopting web-based learning and teaching, and its impact on university teachers.
Chapter Three  
Technology and higher education institutions

Overview

The new and still evolving learning environments that combine both telecommunications and web technology are changing the concept of education throughout the world, providing new challenges and opportunities for institutions and their teaching staff.

While the literature reviewed in this chapter was influenced by the questions in the study, it was also influenced by the fact that the institution within which the study was conducted has had a long history of distance education and of being a dual mode institution offering both on- and off-campus learning. Therefore, while the literature on adoption of innovation is relevant to this study, this literature review starts with an account of the introduction of technology into higher education and technology adoption in universities. The forces driving technology adoption in higher educational institutions and how technology is influencing and impacting on higher education in general are then discussed, before considering the response of the Australian higher education sector. The chapter also considers the impact of technology adoption on teaching academics and the conditions that facilitate adoption in higher education settings.

The move to online learning environments using internet and web-based technologies has its roots in distance education (Farrell, 2001a). A range of labels such as ‘virtual education’, ‘distance education’, ‘online learning’, ‘web-based learning’, and ‘e-learning’ are used to describe these educational modes. This review employs the terms and descriptors used by the authors to maintain the authenticity of their ideas. The term ‘web-based learning and teaching’ as defined earlier (in Chapter Two) will be used when ideas and descriptions are the researcher’s own. In this chapter, the phrase ‘adoption of web-based learning and teaching’ is used in a broad sense to describe the adoption of hardware and software, a learning management system (LMS), as well as new pedagogies, methods, processes and models developed to address learning needs for the
web environment. This also includes changes in the thinking about what is possible in relation to web-based learning technology.

**Introduction of technology into universities**

The educational use of networked computers can be traced back to the 1960s (Harasim, Hiltz, Teles, & Turoff, 1995, p. 7). Their widespread adoption by universities, resulting in the formation of learning networks and communities of learners that worked together in an online environment, gained ground only after the development, proliferation and decrease in costs of media and communication technologies. This resulted in opportunities for creating knowledge in groups (Moore, 1991) by students and staff working collectively, online. Though many teaching academics continued to do ‘business as usual’ in their low-tech classrooms, there were others who embraced computer based learning (CBL)/computer assisted learning (CAL) which were multimedia tutorial type programs. This evolution of computer mediated communication is captured in an early landmark contribution to the literature – *Mindweave* (Mason & Kaye, 1989) which described computer conferencing as an emerging new educational paradigm. Other contributors in the same book described computer mediated communication as a ‘new domain’ (Harasim, 1989, p. 50) and as ‘the third generation of distance education’ (Nipper, 1989, p. 63) based on telecommunication technologies.

The developments and changes outlined in this section affected the institution where this study took place, resulting in a ‘post-industrial model of distance education’ (Garrison, 1997, p. 3). University staff who were early adopters of these technologies recognised and documented computer mediated communication and conferencing, in particular, as a new generation of technology for learning at a distance (Harasim, 1989, 1990, 1991, 1994; Harasim et al., 1995; Hiltz, 1986; Kaye, 1987; Kaye, Mason, & Harasim, 1989; Mason & Kaye, 1989).

Researchers described how computer mediated communication gave rise to complex learning environments that were social, requiring an understanding of social presence and its projection through the medium (Gunawardena, 1995; Gunawardena, Lowe, & Anderson, 1997; Smith & Stacey, 2003a; Stacey, 2002). Other researchers identified a
special skills set required in an online teacher (Kaye, 1992; Rowntree, 1995, 1999; Salmon, 2000). While empowering the online learner was a consideration to some (Harmon & Jones, 1999), others attempted to better understand the learner and analysed the content of computer conferences for learning processes, cognitive skills (Henri, 1992; Henri & Parer, 1993), interactivity and psychosocial dynamics (Mason, 1992; McLoughlin & Luca, 1999).

The growing use of networked technology in universities allowed traditional higher education institutions (in contrast to distance education institutions) to offer off-campus learning programs (Rumble & Harry, 1982). Observing that networking technologies can improve traditional ways of learning and teaching, as well as open opportunities for communication, collaboration and knowledge building, Harasim et al (1995) predicted that, for its sheer convenience and effectiveness, networked technology will be viewed as a major educational force in the 21st century. The convergence of on-campus and off-campus learning opportunities (Tait & Mills, 1999) precipitated by technology was described as technology’s ‘umbilical’ connection to education which resulted in embracing information technology for learning and teaching by all (Thompson, 1999, p. 151).

The advent of the World Wide Web in the 1990s had a huge impact on many universities, especially those that had no distance education programs (Bates, 2000). Web-based learning management systems which handle course delivery, communication and course administration made it possible for the teaching academic to develop teaching materials as well as attend to much of the administration related to the class, such as managing assessments, releasing grades and moderating tutors (Morningstar, Schubert, & Thibeault, 2004). Many traditional universities were excited by these new technologies which enabled higher education institutions to make course participation more flexible and offer learning opportunities online (Collis & Moonen, 2001), blurring boundaries between on-campus and off-campus learners (Bates, 2000).

Miller (1998) explained the impact of technology on education as creating a new environment for teaching and learning that is both caused by changes in technology and made possible by technology. Like O’Donoghue, Singh and Dorward (2001), he saw the
changes in education as a response to the ongoing developments in technology. The resulting change imperatives in higher education institutions are described in the next section.

**The lure of technology in higher education**

Institutions have had to acknowledge and respond to new technological challenges by becoming more flexible and responsive, providing life-long learning opportunities while supporting individual learners through career changes, being learner-centred, providing opportunities for collaboration, being communication-rich and offer courses that are structured to enable direct experience in problem solving and decision making (Miller, 1996; 1998). While many universities are still coming to terms with the challenges posed by the fourth generation of technologies (described by Taylor (2001) as the flexible learning model based on online technologies), universities that have had a history of distance education have been the main leaders in innovation and institutional change (Taylor, 2001). Faced with changing times, changing pressures, increases in mixed mode students and their varying demands, needs and backgrounds, universities have had to be responsive to technology opportunities (Fox & Herrmann, 1997; Segrave & Holt, 2003), making changes to organisational structures to accommodate them (Bates, 1995; Morrison, 2003).

There are many strategic reasons for institutions to incorporate more technology into teaching and learning. The university’s capacity to respond to and embrace technological changes directly influences its success in the marketplace. A study by Fisser (2000) identified 38 reasons which encourage higher education institutions to use technology for flexible learning. The factors listed mostly related to characteristics of technology (such as its ability to provide flexibility, facilitate a new teaching model and the learning of specific concepts, or simply the availability of technology); economic motivations (such as exploiting new markets, cost reductions or cost effectiveness); and social concerns (such as offering re-entry possibilities, reaching the disadvantaged, and supporting life-long learning). Collis and Moonen (2001) argued that the social concerns also translate to economic motivations as they all relate to student numbers and increased funds.
In summary, the most commonly cited reasons for adopting web-based learning and teaching are (1) to enhance the quality of learning, (2) to maintain competitive advantage and (3) to improve access to higher education (Bates, 1997a; Inglis, Ling, & Joostan, 2002; Oliver, 1999):

1. Enhancing the quality of learning – for those supporting a constructivist, collaborative teaching and learning approach, the capacity for using communication technologies has created opportunities to build student motivation, encourage self-directed learning, co-construct knowledge and work with peers (Biggs, 1996; Fox & Herrmann, 1997; Jonassen, Mayers, & McAleese, 1993; Klemm & Snell, 1996; Oliver, 1999; Sing, 1999; Wild & Omari, 1996).

2. Maintaining a competitive advantage – this includes business concerns, cost reduction, increasing economies of scale, reaching out to overseas markets, increasing student numbers, strategic reasons, developing an international presence, increasing student demand, expanding local markets (Pajo & Wallace, 2001), and addressing competition from other national and international providers (Collis & Moonen, 2001).

3. Improving access – this includes being more flexible, increasing student numbers and reaching earner-learners and professionals.

Universities are pressured that ‘you can’t not do it’ (Collis & Moonen, 2001, p. 29) for fear of being left behind. The ideas of ‘having no choice in the matter’ and ‘surviving in the present age’ have been emphasised by others (Wilson, Sherry, Dobrovolny, Batty, & Ryder, 2002). This conveys a sense of inevitability and urgency to keep up and to look modern, in order to gain students. Technological imperatives have had such an impact that traditional life style patterns have changed to reflect an emerging overlap of education, training, work and retirement (O'Donoghue et al., 2001). Web-based technologies including the internet are considered strategic in keeping up with the times and conveying a public image of being a player in the information society which, in turn, attracts students. Collis and Moonen pointed out that this is also important in positioning the institution in the university fraternity, regionally and nationally.
The expectation is that technology mediated learning is cost effective and gives return on investment (Bates, 2000), an attractive idea to many decision making senior administrators. This exerts pressure on cash strapped contemporary universities to expand learning and teaching services using modern technologies with the hope of reaping economic benefits, though this is yet to be proven. Collis and Moonen (2001) clearly stated that using technology will neither save money nor time, at least in the short term, and pointed out that identifying the measurables and developing a model for cost effectiveness and return on investment (ROI) for web-based learning and teaching in institutions is more complex than it seems.

Grineski (1999) approached technology use in higher education without condemnation or praise, but with a series of reflective questions related to values, beliefs, consideration of problems technology is able to solve, the gaps it will create, the real impact on learning and teaching, the types of learner outcomes best achieved through technology and the role of technology in teaching and learning in higher education. Others (Wagschal, 1998) warned of using the new ‘high tech’ packaging without using it in a pedagogically appropriate way.

It has been said that if e-learning technologies are to be used successfully in learning and teaching, institutions will have to change to accommodate these new opportunities and possibilities, and institutional structures will have to be modified (Squires, Conole, & Jacobs, 2000). Farrell (2001b) warned that radical changes would have to be made to the concepts of campus, curriculum, courses, teaching/learning processes, credentials/awards and the way information communication technologies can be utilised to enable and support learning. These trends, which he referred to as ‘macro developments’, include new venues for learning, the use of ‘learning objects’ to define and store content, new organisational models, online learner support services, quality assurance models for virtual education, and the continuing evolution of information communication technologies (Farrell, 2001b). In order to integrate these into the daily practice of the institution, teachers need to believe in the use of e-learning. The next two sections of this chapter discuss the issue of the impact of online learning and teaching in higher education institutions, particularly in Australia.
Chapter Three – Technology and higher education institutions

The impact of online learning and teaching on higher education institutions

Technology has challenged, enabled and amplified trends, enforcing changes in teaching as well as in organisational processes. It has challenged institutions to re-evaluate their current structural configurations, which has led to change at an individual teacher level as well as at an institution level. Supporting this is a wide body of literature related to introducing new online technologies in higher education and the challenge presented to structures, cultures and processes of traditional universities as they undergo transformation. The dramatic rise in the use of new technologies is viewed by many authors as having a critical impact on the nature of education and the nature of universities (Bates, 1997, 2000, 2001; Collis & Moonen, 2001; Daniel, 1996; Inglis et al., 2002; Laurillard, 2002; Morrison, 2003; Newton, 2003). Broad university-wide implications related to vision, strategic planning, systems and organisational structures are noted by all these authors. Its significant impact has caused the reconsidering of boundaries between flexible learning, online learning and off-campus and on-campus learning (McConachie & Danaher, 2005).

Organisational change as a consequence of new models of learning and teaching made possible due to online technologies is a key influence that figures prominently in the literature (Bates, 1997; 2000; 2001; Collis & Moonen, 2001; Epper & Bates, 2001; Morrison, 2003; Orlikowski, Walsham, & Jones, 1996; Steele, 1995; Wilson, Sherry, Dobrovolsny, Batty, & Ryder, 2000; Yetton, 1997). The existing educational structures and their suitability for new functions are being questioned. The common theme is that existing institutional resources must be ‘re-engineered’ (Brown, 2001) to fit changing circumstances.

The next section focuses on how Australian universities have responded to technological change and to the pressures to adopt web-based learning and teaching.

Australian universities

Given its geographically dispersed population, large distances, relatively sophisticated technology infrastructure, including a well established telecommunications network and
long experience with off-campus delivery, Australia already had the conditions for adopting information communication technologies (Tapsall & Ryan, 1999). Conditions were further stimulated by equity and access issues, high student mobility, a high earner-learner population, the capacity to accommodate diverse learning styles and needs, and reduction in funding and staffing levels in universities, together with increased student enrolments and the possibilities offered by the new technological developments. While these were identified as key factors by Johnston (1999), they are not unique to Australia where the boundaries between distance education and on-campus learning have continued to blur with universities preferring to use terms such as ‘flexible delivery’, ‘flexible learning’ and ‘flexible approaches’ (Johnston, 1999, p. 39) which are labels that accommodate all students and are place and time free.

Tapsall and Ryan (1999) gave an Australian perspective on the increasing use of information communication technologies in higher education and described it in terms of distance education, which is a response to barriers such as geographical distance and work; open learning, which is a response to open enrolment and a second chance for higher education; and flexible learning, which is a response to providing more education, accommodating numbers and reducing costs.

The Australian government commissioned several large scale studies. Yetton (1997) investigated the management of information technology in Australian higher education institutions and found a lack of systematic evaluation of information technology investments in universities and called for a tightly interdependent strategy involving structure, management processes, roles, skills and technology support for successful information technology integration in universities.

Cunningham, Tapsall, Ryan, Stedman, Bagdon, and Flew (1997) reviewed the extent and implications of convergence and borderless education and found that the Australian system had high credibility in terms of quality programs, staff and distance education methodologies. Australia’s geographical positioning in relation to Asia (and Asian markets), stringent copyright regulations, flexible approaches using communication technologies and a strong telecommunications infrastructure were also advantageous. Their report also identified Australian universities as having strong partnerships in Asia,
banks of quality learning materials to draw from, and many strong continuing professional development programs, which were opportunities to be exploited.

Similar large studies were conducted to understand and manage technological change in order to ‘mainstream the digital revolution’ (Alexander & McKenzie, 1998; Coald rake & Stedman, 1999; Wills & Yetton, 1997). Other studies included a survey of online education services in Australia (Bell, Bush, Nicholson, O'Brien, & Tran, 2002) and a report to the Commonwealth of Learning on the status of virtual education institutions in Australia (Tapsall & Ryan, 1999).

The study conducted by Wills and Yetton (1997) examined 20 Australian universities and identified five main reasons for universities’ adoption of information technology and the move to offer learning and teaching through flexible modes of delivery: to improve the quality of teaching, to reduce costs, to service multiple campuses, to compete for students and to service the increasing numbers of part-time mature aged students. Their report also highlighted the need for strategy, structure, management processes, roles skills and technology to demonstrate a ‘tight fit’ for technology adoption to be successful, the importance of which has been reconfirmed by others (Bates, 2000; Collis & Moonen, 2001).

Though not researching technology adoption, the important study conducted by Alexander and McKenzie (1998) summarised an evaluation of 104 government funded information communication technology (ICT) projects in universities in Australia. The findings of the study are useful as it provided a set of criteria which, if followed carefully when selecting ICT projects for development and funding, improved the chances of success in higher education settings, complementing the report by Wills and Yetton (1997).

The current key concerns of Australian universities have now moved out of direct technology issues to technology related issues. These have been identified as benchmarking and standards (Inglis, 2005), ensuring quality (Reid, 2005), competition, commodification of knowledge, deregulated markets and the increasing reliance on non-government funding (Nunan, 2005), massification of higher education and
organisational reform (Cummings, Phillips, Tilbrook, & Lowe, 2005) and internationalisation of the curriculum (McConachie & Danaher, 2005). These are all concerns, opportunities, challenges, risks and tensions that arise from widespread technology adoption in higher education.

This section described how the Australian higher education sector took stock of the impact of web-based technologies on learning and teaching. The next section describes institutional strategies to adopt web-based learning and how universities have considered making these changes.

**Institutional strategies for adopting web-based learning and teaching**

Like the Australian universities, higher education institutions worldwide have been weighing up and considering the changing landscape precipitated by web-based technologies and their impact at institutional level.

As early as 1987 when networked computers were coming into higher education, Reigeluth signalled the need for system-wide planning and modification in the following warning:

> As we enter deeper into highly technical, rapidly changing information oriented society, the present structures of our educational system will become more inadequate (Reigeluth, 1987, p. 4).

Highlighting the need for change, Berge (1998), more than a decade later, called for ‘serious re-engineering’ of higher education structures and policies, or universities would be working hard at the wrong thing – like rearranging deck chairs on the Titanic. On the same theme, Peters called for a ‘transformation of the university’ and suggested that

> The structures of the university workforce will have to change and a previously unheard of number of educational designers, graphic artists, media experts, internet experts, project managers will have to be a part of its workforce (Peters, 2000, p. 18).

This highlights the repeated warnings and reminders of the need to modify institutional structures as web-based learning and teaching approaches are adopted by higher education institutions. Bearing in mind the bottom-up/top-down character of change,
Collis and Moonen (2001) categorised institutions into one of three phases of change with regard to adopting new technology and more flexible approaches to learning. They described how change can occur at the level of the individual teacher (the pioneer), supported by decisions that make it convenient (encouraged use) or a policy decision that requires all teachers to use technology (systemic use). While there is no policy at the first level, there are top-down policy or authority directives, rules and lines of power related to the two latter approaches. In contrast to top-down or bottom-up approaches, Rowley and Sherman (2001) suggested consensus change as suitable for universities which are more likely to operate on the notion of shared governance.

Hagner (2000, p. 27) explained that institutional change needs an ‘enabling environment’ as a precondition and listed environmental factors such as universal student access, reliable networks, multiple opportunities for training and consulting and a faculty ethos of experimenting.

Houseman (1997) described his personal experiences at the University of Ottawa and critiqued the general university administration for not putting into place a strategic planning process for the use of information technologies. In contrast, Daniel (1997) explained the need for policy and argued for development of a technology strategy within the university planning processes and frameworks, citing the UK Open University as an institution that followed such a path.


Bates (1997a; 1997b) suggested twelve organisational strategies for change without which he was convinced technology based teaching would remain a marginalised activity. He recommended: having a vision for how learning and teaching should take place in the future; allocating funding right down to the individual department; having a strategy to ensure support; building and strengthening the technology infrastructure; building and strengthening the support services groups; improving student access and ownership of computers; developing new models and integrating technology use in
teaching; providing the necessary training for teaching staff; assisting in project management; developing complementary organisational structures; encouraging collaboration and alliances between universities; and having a systematic research and evaluation plan.

The institutional strategy Collis and colleagues proposed was an integrated model (Collis & Moonen, 2001; Collis, Peters, & Pals, 2001) to predict the possibility of adoption and diffusion of telecommunications-related technological innovations (email, World Wide Web and teleconferencing in particular) in learning settings. They advised having a pedagogical goal at university/faculty/program level; addressing infrastructure requirements such as networks and reliability; evaluating and debating practice internally and elsewhere; considering quality assurance; developing expertise through staff development and support; funding and sustaining initiatives; and implementing a monitoring and resourcing plan. Referred to as the 4E model, their model identified environmental factors, effectiveness, ease of use (personal) and engagement (institutional), as aspects to analyse, in order to implement strategy. Using this model Collis and van der Wende (2002) subsequently reviewed models of technology adoption on a global scale.

Rowley and Sherman (2001) in their book dedicated to strategy and change in universities, listed eleven methods of effective implementation. The first eight of these (using the budget to fund strategic change, using participation, using force, establishing goals, establishing key performance indicators, working with human resource management to plan and create change, using reward systems to foster and support change and staff development) were considered as ensuring immediate results. The other three strategies (moving away from tradition, developing and using change champions, and building on systems that are ready for and adaptable to change), are paradigm shifts that are long term options and relate to structural and leadership areas of the university.

Taking a pragmatic approach to change in an institution and its impact on those working within it, Rowley and Sherman (2001) went on to describe a seven phase process – beginning with converging interests through participation from all teaching academics, establishing a charter, formalising it, identifying problems, reporting, acting on plan and
finally evaluating it. Since the human factor cannot be ignored, this plan attempts to empower teaching academics to take responsibility for and control of the outcomes of change. Involving teaching academics in establishing strategic goals and sharing the responsibility has also been identified as important by others (Bates, 2000; Howell, Saba, Lindsay, & Williams, 2004).

The proposed framework for organisational change by Laurillard (2002), unlike the others, was more theoretical and extended from her conversational framework for learning. Her recommendation for an effective organisational infrastructure was a reinterpretation of her conversational framework for experiential learning. Organisations, according to her, must generate new knowledge, monitor existing activities, respond to the external environment, and adapt and change through a continuous and dynamic process of iteration between the different levels of the individual, group and organisation. She tied this in to her conversational framework for learning by arguing that teaching academics should also research not just their discipline area but also the learning and teaching of their discipline, effectively bridging the two activities, making the university a learning organisation. She insisted that a university is not a learning organisation when research and teaching are treated separately because continued innovation is necessary to be competitive and to be able to respond to external environmental changes.

Berge (1998) suggested that universities tended to change policies when implementation of web-based learning and teaching met with a barrier instead of anticipating and putting in place a policy framework in advance to mitigate bureaucratic problems. He identified the need for policy in seven operational areas – academic, fiscal, geographic service area, governance, labour management, legal and student support. These ideas are not new. According to Hughes, Hewson and Nightingale (1997), at an institutional level, there must be firm commitment to training, implemented via an institutional strategy that cascades down to the faculty and department level backed up with responsibilities related to hardware installation and the provision of training opportunities.

Strong administrative leadership is required to support necessary changes within the institution. To be fully implementable, vision, direction and process must all be clearly
stated up front, and many universities now have their strategic plans on the web (for example, Monash University, 2001, 2002a, 2002b, 2003a, 2003b, 2003c, 2005a, 2005b). While such plans articulate the vision and strategic direction of the university, how these cascade down to the individual faculty and the individual teaching academic is less clear. Policies are made and described in reports or included in formal institutional documents (for example, Monash University, 2001, 2002a, 2002b, 2003a, 2003b, 2003c, 2005a, 2005b), but they are not often subject to academic analysis. Analysis of issues in policy formulation such as the process by which policies are arrived at, and institutional participation, impact on institutional culture and input of staff, are even less scrutinised in the research. Berge (1998) was of the opinion that strong institutional policy was necessary to change institutional culture in universities.

More recently, perhaps with the realisation of the importance of the role of policy in technology adoption and implementation in institutions, the topic has been discussed by Cummings et al (2005). They argued for a middle-out approach as against a conventional top-down or a bottom-up approach, claiming its greater acceptance and sustainability in relation to decision making and change management. They cited the Australian Murdoch University experience as an example of such an approach where the champions of change were middle managers rather than senior staff instituting a top-down approach, or teaching staff trying to effect a bottom-up approach. These middle managers had support from senior managers and this was a successful approach in that context. For innovations to be adopted, teaching academics need to be reassured and certain that they are supported from the top with a clear institutional vision, policies, leadership and commitment to the cause (Errington, 2001). Policy and strategy must be clear and innovation can fail if it is not backed by a strong staff development policy (Brown, 2001; Errington, 2001).

Related specifically to the Australian higher education context, Hart, Ryan and Bagdon (2000) and McNaught and Kennedy (2000) respectively reported on the Queensland University of Technology (QUT) and Royal Melbourne Institute of Technology (RMIT) experiences. The QUT experience indicated that for successful technology adoption in their university, visible and energetic support of the senior management was mandatory.
Hart et al also suggested publicising success (and failure) of adoption through workshops, web discussions and training programs and a union between the dichotomised ‘techo’ and ‘teacher’ groups. They pointed out that institutional restructure is painful and fearsome to many and that the atmosphere becomes distrustful as job responsibilities are reworked and reclassified.

The RMIT experience was that the congruence of policy (e.g., strategic processes, funding), culture (e.g., motivation, collaboration, funding, rewards, leadership) and support (e.g., access to information, infrastructure, professional development, funding, time) were necessary for successful adoption of computer facilitated learning (McNaught & Kennedy, 2000).

These examples and experiences point out that there is no single template for organisational change, while others (Lisewski, 2004; Stiles, 2002) have stated more categorically a lack of a technology strategy as a barrier to their widespread adoption.

Institutional strategies are not effectively addressing issues of pedagogy or the introduction of learning technologies. Technological decisions are not being made with a closer focus on what institutions are trying to achieve and staff are not being encouraged or enabled to focus on educational goals before making decisions about the pedagogic approach required and the technology to be used to deliver and support it. (Stiles, 2002, p. 8)

In short, institutional intent must be matched by strategy (Errington, 2001), to avoid the danger of ‘ organisational schizophrenia’ (Lisewski, 2004, p. 185), though it must be noted that plans, sensible as they are, work to varying degrees of ease and efficiency at ground level in different institutions. This is explored in the current study.

The impact of online learning and teaching on university teachers

The literature relating to the impact on teaching academics of adopting online learning and teaching, is profuse. Houseman (1997) acknowledged that the human side of technology adoption and how teaching academics will respond to adopting innovations is not considered enough in higher education institutions’ enthusiasm to take up information technology.
Making the change from the real to the virtual may be technically feasible but it also has practical implications for teaching academics in institutions. Most of the teaching academics investigated in this study appear to have embraced e-learning approaches through their own conviction. Others have done so simply because it has been a top-down directive. Many have deeply rooted concerns about changes in work practices or simply that technology is unable to replicate a good teaching session.

While the current study focuses on the factors that impact on the adoption of web-based learning and teaching approaches on teaching academics at Monash University, the next sections examine five specific concerns resulting from the adoption of web-based learning and teaching as raised in the literature. These five concerns are reviewed because they have recurred in the literature and because they are relevant to the current study. These themes are – developing new roles and skills; staff development; workload and time pressures; the impact on research; and rewards.

**Developing new roles and skills**

The implementation of information technology to support educational and administrative work is resulting in changes to the roles of staff which are causing some tensions and difficulties. Forewarnings that universities will experience significant stress associated with role changes have been issued (Duke, 2002).

The role of the teaching academic has come under increasing consideration (Berge, 1996) and a significant volume of literature has highlighted the burden on staff resulting from the need to develop new roles and skills as a consequence of adopting web-based learning and teaching approaches. Harasim et al (1995) pointed out that teachers are in a transition phase and require different skills. These include assisting learners to navigate networks, fostering learning interaction and being learner-centred (Steele, 1995). The significant role change and associated demands led Paulson (2002) to call for a ‘re-configuring’ of traditional teacher roles.

The study undertaken by Hughes et al (1997) on behalf of the Commonwealth Government (in Australia) and reiterated by others (Wills & Alexander, 2000)
recommended that both academic and administrative staff be given sophisticated technological literacy, and that the nature of their work and responsibilities be redesigned to accommodate both new technology, the new structures and new work relationships. Pointing to the need for complementary roles, Hughes et al (1997) identified that, parallel to the new roles of teachers, general staff also need a greater range of skills, including informatics, skills relating to working in teams, plus those skills required by managers and administrators. General staff also need a basic understanding of pedagogy so that they understand the teachers’ requests and what they are trying to achieve. A previous report also suggested the breaking down of barriers between academics and general staff and the emergence of a new view of these groups as co-professionals (Tinkler, Lepani, & Mitchell, 1996). Conversely, teaching academics have been increasingly taking on administrative tasks previously conducted by ‘general’ staff, thus extending their roles and making them more multifaceted, resulting in a ‘blurring of borders’ (Ryan, Fraser, & Dearn, 2005, p. 183) between general and academic staff.

While recognition of teaching academics’ new functions such as managing and directing are necessary, understanding of individual roles within a team, and team dynamics, is crucial and calls for new skills such as scoping and managing projects which in turn command a need to operate in new roles such as project manager.

Networked administrative systems have devolved student administration to faculties and schools and teaching academics now handle more administrative jobs. Heads of schools make decisions regarding curriculum development, equipment purchase and teaching online and may not have the exposure and skills to understand all their related implications (Hughes et al., 1997).

As teaching becomes more information technology intensive, teachers need a different set of core skills that include word processing, using of presentation software, project planning, programming, and managing graphics, sound and video files (Hughes et al., 1997). Hughes et al also considered that the role change would eventually have teaching academics getting involved in interface design, storyboarding, and media selection, including graphic design and programming.
Chapter Three – Technology and higher education institutions

Harasim (2000a) conceptualised the new teaching academic as a ‘virtual professor’ which requires the teacher to move away from being a content provider using face-to-face approaches to becoming a facilitator online. Berge (2000) listed the components and functions of the virtual professor role as including movement away from the traditional lecturer/oracle to consultant and guide, from providing answers to becoming expert questioner, from being a solitary teacher to a member of a learning team and from maintaining total control of the teaching environment to sharing with the student as a fellow learner. New roles for e-moderators are also identified by others (Berge & Collins, 2000; Goodyear, Salmon, Spector, Steeples, & Tickner, 2001; Salmon, 2000).

Staff development

Complementary staff development is part of the infrastructure that supports technology adoption, and is one way of anticipating and planning for lowering resistance to change (Errington, 2001) and promoting innovation diffusion. It is also a way of holding teaching academics accountable to a standard of preparedness (Howell et al., 2004).

Related to the new role of teaching online is a huge and ongoing need for professional development and the revamping of support systems to help teaching academics to gain confidence to use the technologies for teaching and learning. Hughes et al (1997) and Moran (1996) identified the challenge institutions are faced with to provide complementary staff development, reengineer the infrastructure to allow sensible use of the technologies, rework teaching practices, upgrade skills, redefine roles of staff and support students. This is confirmed by Turoff who forecasted this challenge and predicted that

The most serious bottleneck to the introduction of this [CMC] technology in colleges and universities is not the technology itself or its costs, nor the adaptability of students; it is the retraining and adaptability of faculty (Turoff, 1990, p. xi).

Over a decade later Epper and Bates made a similar observation.

. . . the most daunting challenge in implementing technology in college teaching is ahead of us: the development and training of faculty (Epper & Bates, 2001, p. xv).
The fact that this is a recurring theme in much of the literature is a clear indication that the need persists. The literature is prolific on the professional development requirements of university teachers as they move to web-based learning and teaching environments (for example, Bates, 2000; Bennett, Priest, & Macpherson, 1999; Berge, 2000; Epper & Bates, 2001; Evans & Nation, 1997; Fox & Herrmann, 2000; Kulski, Boase-Jelinek, & Pedalina, 2002; McNaught, 2003; Schrum, 1999; Thompson, 1999; Wilson & Stacey, 2004). The professional development teaching academics need ranges from reflecting and analysing their teaching and learning, developing flexible, pedagogically appropriate learning resources to managing students online, to moderating conferences and simply learning to operate the software. In short, if technology adoption is to achieve its full potential, teaching academics need to be helped to deliberate on their teaching and reconfigure it to optimise the opportunities offered by technology to serve their learner groups and their learning needs.

In identifying specific areas for staff development, opportunities to develop good teaching practice using new technologies have been considered highly relevant (Wills & Alexander, 2000). Related to this need is theoretically grounded pedagogical knowledge to allow staff to utilise technology and employ good pedagogical techniques in designing learning materials. As aptly suggested by Negroponte (1995, p. 198), ‘don't dissect a frog, build one’ is the new approach that the new environments demand. Significant changes are therefore needed to teaching strategies in order to operate in the new learning environments.

More recently Salmon (2000) proposed a practical five-phase model for moderating learners online which provides a useful commonsense approach for teaching academics. Her book, E-moderating, offers a range of resources for practitioners and is a manual that responded to a training need at the time. Subsequently, her book E-tivities (Salmon, 2002a) took a similar approach to preparing activities for learners working online.

Alexander and McKenzie (1998) and Wills (1999) identified the need for staff development in project management; working effectively in teams; evaluation of IT projects; legal issues related to IT development; good teaching practice; and the opportunity to share experiences. Wills argued that if there is a paradigm shift in the way
educational institutions deliver learning, then there should be a paradigm shift in staff development, making it available just-in-time and anytime-anywhere. This approach to staff development is supported by others (Hewson & Hughes, 1999; Kandlbinder, 1999; Kulski et al., 2002; Zuber-Skerritt, 1993) as time has been identified as an obstacle to participation in staff development programs (Moore & Kearsley, 1996). Online staff development has allowed teachers to take control of their own professional development (Samarawickrema & Benson, 2004; Stuckey, Lockyer, & Hedberg, 2001).

Increased use of information technology in the university naturally places considerable pressure on its staff development arrangements. Accredited courses have been set up in higher education institutions to provide staff development in effective learning and teaching using technology. Monash University through its Graduate Certificate in Higher Education has institutionalised such a program by making the study program a requirement for all new staff (Edwards, Webb, & Murphy, 2000).

Hughes et al (1997) observed that skills development in relation to information technology for teaching staff and administrative staff, is handled differently. Teaching related staff development opportunities are better resourced, better structured and seen to be more crucial in the achievement of institutional goals. However, in general, their study showed that teaching staff were not supported in all areas of their work, particularly in the technology skills required to support their research work. They found that most staff development units provided training in using specific software packages but did not deal with pedagogical issues related to technology use. Bennett et al (1999) confirm that many staff development opportunities in the area of online teaching are limited to short workshops that focus on skills required to produce materials for the web and that few staff development attempts have focussed on appropriate pedagogy in developing electronic learning materials.

Hughes et al (1997) highlighted several issues arising from the role change of staff caused by information technologies, including working conditions and staff development, implications for industrial relations, and the need for extensive training and development, including the question of whether such development should be mandatory or voluntary. They confirmed that although there is a broad and extensive
need for training, staff are also stressed and are short of time for training. While training is an essential part of any change process, resistance to training is not new (Kandlbinder, 1999). All these factors have the potential to cause resistance to change (Hughes et al., 1997). This attitude is not helped by the lack of a reward system that is tied to innovation in instruction (Passmore, 2000) (described later in this chapter).

Educational technologies have been around for some time and enthusiastic and innovative teaching academics have been experimenting with learning technologies for some years now and have led the way in innovation and technology adoption. Today more ‘mainstream’ teaching academics are taking to using technology in their teaching and their concerns and needs in staff development must be addressed.

**Workloads and time pressures**

Changing roles often mean that there is a short term increase in workloads which has given rise to re-evaluation of workloads and clarification of work roles (Hughes et al., 1997). However, a survey conducted by Hislop and Atwood (2000), at Drexel University, USA, indicated that web-based learning and teaching will be a significant and permanent part of the workload of teaching academics and suggested that new staff members are hired with the understanding that they are likely to teach online as well as face-to-face, and that teaching online is a desirable activity in the performance management program. They further suggested that, instead of asking ‘Should online teaching be a part of the faculty workload?’ the question should be ‘How to make it a part of the routine faculty workload?’, which makes institutional culture and context all the more relevant.

Many teaching academics from universities the world over (including participants in this study) have raised concerns about the increased demands on time in developing web-based learning resources and tasks related to managing an online class.

Lack of time to develop e-learning resources was a key barrier and a recurring problem reported in several studies. Newton’s study of computing and information studies departments in UK universities (Newton, 2003), Naidu’s study at Manchester
Metropolitan University, UK (Naidu, 2004), studies by Spotts and Bowman (1993) and McKenzie, Mims, Bennett and Waugh (2000) at State University of West Georgia, USA, along with Wilson’s study of a consortium of 54 universities across 15 US states (Wilson, 1998), and Ebersole and Vorndam’s study conducted at the University of Southern Colorado, USA (Ebersole & Vorndam, 2003), all share the same conclusion regarding the lack of time to develop web-based learning resources and an ongoing concern of teaching academics related to time.

The impact on time and the increased workload reported in these studies were also cited by Garrison and Anderson (2000) who believed that teaching with technology created unsustainable workloads. However, Harasim (2000b) considered that the workload decreases dramatically as teaching academics become more comfortable with the new medium and its requirements.

Salmon (2002b) argued that online time is a concept that is emotive and value-laden and the very fact that web-based learning makes any-time, anywhere learning its advantage means that time cannot be bounded as in a face-to-face lecture. She explained that the use of time in online courses is more fluid and that teaching academics should expect to modify their schedules accordingly. She suggested specifying clearly the time frames e-moderators are expected to commit to and what learners should do. In addition, reducing off-line activities that online activities complement, being explicit about who is going to do what online, how much time is expected to be devoted to the task and the rate of payment for e-moderators should be clearly stated up front to make expectations related to time commitments clear.

The additional time to prepare learning resources has been documented by others (Cavanaugh, 2005; Pachnowski & Jurczyk, 2003). Pachnowski and Jurczyk (2003) reported that after the first offering, preparation time reduced as did financial support and supervisor and colleague enthusiasm. Cavanaugh’s more recent comparative study of a traditional class and an online offer of the same course (using WebCT) reported that the amount of time spent teaching online increased directly with the numbers of students enrolled, that it was twice the time spent teaching in class, and per-student time was as
much as six times more with the major time spent on communication (Cavanaugh, 2005).

Reporting on management of the online class (rather than content specific teaching), Collis and Nijhuis (2000) concluded that the burden imposed by preparation time decreased over time, though updating and quality control consumed time. They found communicating easier, though archiving that communication effectively and efficiently, structuring communication and writing accurate instructions so that clarification emails from students were reduced, also consumed time. Other time consuming activities were identified as providing assignment feedback, monitoring group work and maintaining individualised student records which require an increased level of interactivity from the teaching academic (Collis & Nijhuis, 2000).

Quantitative studies emerging more recently have attempted to search for actual figures to back up claims of extra time taken for teaching online. A longitudinal study conducted at the University of Michigan, USA reported on three online courses of 25 students each. The data showed that teaching online needed three to seven hours per week, unlike a traditional class that meets one to three times per week. In addition, teaching online required the teacher to be available each day, and participation in, and grading online discussions were found to be the most time consuming activities (Lazarus, 2003).

Hislop and Ellis (2004) studied a sample of five teaching academics at Drexel University, USA who taught Information Systems and required them to log time spent on different activities. Though the study had a limited sample size and a small online class size, the findings indicated that the total time spent on online sessions was less than in the traditional sessions. However, when the data was normalised for class size, the amount of effort the teaching academic expended per student was roughly equal for both modes of delivery. They explained that the perception that teaching online is more time consuming because it is more effort. Large numbers of shorter duration activities increased cognitive overhead (or the effort needed to juggle several tasks) and may increase teacher perception of effort as against actual time.
Another empirical study conducted at Penn State World Campus (Thompson, 2004), considered a sample of six teaching academics of whom three reported lesser workload to teach online and a fourth, a comparable workload to face-to-face teaching. As in the study by Lazarus (2003), Thompson reported that time spent teaching online was not greater but it was necessary to be online several times per day, leaving teaching academics less effective and less productive time spans for research and scholarly activity, resulting in a feeling of being less productive and a perception of greater workload which led them to adopt strategies that reduced the workload (Thompson, 2004).

Bender, Wood and Vredevoogd (2004) also did not support the belief that teaching online takes more time than teaching in a traditional class though they confirmed that on a per-student basis (once enrolment figures were factored into the analysis) teaching online was more time consuming. Assessment, feedback and student communication (email) were particularly demanding on time.

Though none of these studies included course/materials development time in the investigation, Lazarus (2003) pointed out that the time needed to teach online courses may vary according to content area, type and level of course, and course design. While these empirical studies provide useful data, they are context-specific and their generalisability is limited.

**Impact on research**

In a traditional research university setting, teaching is a poor second cousin to research (Houseman, 1997) and there is no compelling reason for teaching academics to change the way they teach. From the teachers’ perspective, acquiring new skills and developing new teaching resources is time consuming and takes time away from the ‘more highly rewarding activities’ (Garrison & Anderson, 2000, p. 31) of discipline based research and doctoral work. Concerns relating to lack of time for discipline based research were raised by Howell et al (2004). Similarly, Hughes et al (1997) highlighted the increased demand on time to develop e-learning resources and to work online with students and the conflict with the teachers’ time spent on research activity.
Rewards

Teaching academics are also concerned that increased effort invested in web-based learning and teaching to develop new resources, to learn new systems and manage virtual classes, while maintaining all other tasks and duties, is not adequately rewarded and many have referred to discontent in this area (Howell et al., 2004). Using reward systems to achieve strategic change is not new. All rewards need not be financial – time release, program development and recognition, improved relationships, and a sense of community have been identified as encouragement to teaching academics (Rowley & Sherman, 2001) though there is no single model for how merit monies or other rewards can be allocated. In addition, improved student learning was an intrinsic reward cited by many (Brown, 2000).

Wolcott (1997), attempting to understand the relationship between reward systems and teaching online, conducted a qualitative study across four universities where 32 individuals participated, and found a reward culture that does not accommodate teaching online. Specifically, she found that teaching online occupied marginal status, that it was not highly valued nor well rewarded as a scholarly activity, that it was not related to tenure or promotion decisions, and that reward depended entirely on the academic units’ commitment to online education.

Hartman and Truman-Davis (2001) described the University of Central Florida incentive program which funded the development of selected online courses which are also evaluated on an ongoing basis. Evaluation data and its analysis are the teaching academic’s intellectual property, thus encouraging them to write about and present on the innovation as a scholarly activity.

Hagner (2000) studied the rewards and incentives of seventy five innovators featured in Teaching with technology (Brown, 2000), and found that personal satisfaction of a job well done was their only reward for their innovation and some were quite disappointed at the lack of official recognition they received. Hagner concluded that the innovators’ impetus was internal, that they shared the desire to improve learning, and possessed the expertise, but did not receive substantial return or recognition for their effort. In short,
their real incentive was their strong commitment and their reward, personal satisfaction. Subsequent waves of adopters, however, were expected by Hagner to be more risk-averse and look to rewards such as tenure, promotion and adoption as a way to advance careers.

Passmore (2000) critiqued administrators and faculty committees saying that they have little understanding of how to evaluate teaching academics’ work related to using information communication technology for learning, or how to evaluate the development of new educational technology applications, and pointed to the lack of a peer reviewing process for information technology applications for learning. While all these studies demonstrate that teaching academics’ work and institutional reward schemes in the 1990s were not in harmony and did not support the work appropriately, changes have been gradually introduced to redress the situation because without adequate rewards, innovative, highly motivated and experienced teaching academics will be hard to attract and recruit. Though the issue of tenure still remains highly debated (Yick, Patrick, & Costin, 2005), the Australian Commonwealth Government (Nelson, 2003) and higher education institutions in Australia have established a reward and recognition scheme for excellence in teaching.

Teaching excellence is gaining increasing importance as the scholarship of teaching is recognised to be as important to a university as research. Skelton (2004, p. 453) through his four nation comparison of award schemes insisted that such schemes have ‘become commonplace in recent years’.

In Australia, the Commonwealth Government Department of Education Science and Training (DEST) has taken an active role in promoting rewards as part of an incentive scheme for excellence in learning and teaching. The Department sees it as a way to promote overall quality in the sector. Teachers in the higher education sector are eligible for the new Australian Awards for University Teaching and the prestigious Prime Minister’s Award for ‘Teacher of the Year’ valued at $50000, and institutions that demonstrate excellence in learning and teaching are also eligible for similar institutional awards in learning and teaching performance (Nelson, 2003). Similarly, most higher
education institutions in Australia, including the one in which the current study takes place, have set up awards to reward distinguished teaching (Monash University, 2003d).

In addition, many Australian universities have made changes to their promotion processes to ensure that contributions to teaching are rewarded and acknowledged. Tied in with promotion and tenure is the professionalising of teaching in higher education through Graduate Certificate programs and similar accreditation programs.

**Emerging research themes**

A succinct outline of gaps in research in computer supported learning has been provided by Smith and Stacey (2003a). These gaps include studies related to computer supported collaborative learning with large student groups, the study of the notions of ‘community’ and ‘practice’ from a student perspective, online learning in the workplace and communities of practice within workplaces, access associated with within-household competitive pressures, and investigations of cultural groups with cultural characteristics as dependent variables. As knowledge sharing is increasingly becoming important for professional development and, in particular, sharing within a specific knowledge domain, de Vries and Kommers (2004) also highlighted the gap in research, and therefore the need to monitor trends and pursue research in the area of online communities of practice as did Smith and Stacey (2003a). Research questions that need further exploration identified by McAndrew, Brasher and Hardy (2004) related to measuring effectiveness in e-learning; quantifying pedagogical effectiveness; changing pedagogical effectiveness in response to changes in resources; representation of effective learning designs; and methods of effective knowledge sharing. Beetham (2005) was convinced that research priorities for the future should focus on areas that will have a real impact on learners and practitioners. Yet, research in the area of e-learning and web-based learning and teaching is a rapidly evolving field and reviewing the research needs of ‘a moving target’ is indeed difficult.

Many have observed that web-based learning is in its infancy and still evolving (Aggarwal, 2000, 2003; Laurillard, 2002), and that consequently it is a constantly changing field, in an era of change, as well as technological change (Smith & Stacey,
As a result, learning through experience continues through the contributions of teaching academics who consist of the mainstream users across the world (Aggarwal, 2000, 2003).

In the recent past, edited collections of case studies on topics such as flexible learning (Hudson, Maslin-Prothero, & Oates, 1997), online learning (Murphy, Walker, & Webb, 2001), and problem-based learning (Schwartz, Mennin, & Webb, 2001) have contributed to the field. The publishing company Kogan Page had a specific series titled ‘Case Studies of Teaching in Higher Education’. Case studies are also presented and published at various national and international conferences related to learning and teaching and technology. Many of these case studies may seem small and narrow in focus, being discipline and institution specific, yet they provide a valuable contribution made by mostly mainstream teaching academics who describe their experiences with technology as they embed and integrate it within their practice. They each contribute a building block for a more holistic picture of technology use in higher education. In an emerging field, theorising depends on the hundreds of case studies and reports provided by the many teaching academics who are practising, experimenting and reporting on their work.

What is noteworthy about these case studies is the process of sharing experiences for others to learn from. Unlike the early writers in the area of computer mediated learning such as Harasim, Hiltz, Henri, Mason, Turoff, and others, who came from a broad distance education background and are still considered key contributors to the field, these new contributors of case studies have different backgrounds, no longer belonging to one particular discipline, mode of delivery, or area of study, and demonstrate the mainstream teaching academics’ take up of web-based technologies. These case study writers also use a range of similar and overlapping terminology – web-based learning, online learning, e-learning, asynchronous learning networks, virtual learning, computer mediated learning, and computer supported collaborative learning, to list a few. Also, the international scope of these case studies is noteworthy; they do not only come from the developed, ‘technologised’ world.
Though less like the above case studies, Petrides (2000) published a series of articles on policy issues related to technology adoption in higher education institutions, including planning and management, implications for people and culture, and reflections on a changing environment. In another series of articles, Lau (2000) focussed on theoretical foundations, conceptual aspects and practical implications of distance education. Contributors to the book by Aggarwal (2000, 2003), wrote of opportunities, infrastructure issues, technology considerations and pedagogy in different learning environments. A collection edited by Naidu (2003) is not presented in a case study format but all contributions are about the use of information communication technologies to leverage the core processes of learning and teaching in order to achieve a rich learning outcome. A collection by Albalooshi (2003), addresses issues, concepts and trends related to virtual education, while Murphy, Carr, Taylor and Tat-meng (2004) address similar issues in contributions about distance education and innovative approaches related to teaching and learning with technology. Fraser (2005) in a recent collection focuses on staff development, higher education and technology related structures and strategy.

Similarly, there is a large body of literature related to introducing online teaching and introducing learning management systems (LMS) in higher education. Contributions appear particularly in conference proceedings describing current practice, and in university documents. They are mostly non-critical in approach, descriptive and case specific, while a few reports are published in journals (Engwirda & Jong, 2001; Housego & Freeman, 2000; Jefferies, Constable, Kiely, Richardson, & Abraham, 2000; Morningstar et al., 2004; Phillips, 2002; Weaver & Nair, 2004; Yip, 2004). However, more recently these learning management systems have been critiqued as technology hindering good pedagogy (Hotrum, 2005).

The current research problems, therefore, focus less on theorising and more on attempting to better understand the processes of transforming and adopting new procedures, new ideas, new policies, new pedagogies to suit the new media, and new work practices. They are mostly descriptions of case studies by mainstream teaching academics grappling with these issues, and contribute to describing the evolution of
flexible learning, as well as contributing the necessary data to widen understanding and develop related theory.

What none of these case studies do is to describe failure (Latchem, 2005; McPherson, 2005). They do not usually touch on how costs blow out, how and why technologies failed to deliver, why teaching remained untransformed, problems related to time release, lack of support for work, and disputes with management, though there is as much to learn from these experiences as from success. Latchem (2005) highlighted that learning happens not only through ‘best practice’ but also through the consideration of ‘grey areas’ or the realities. He pointed out that engaging in learning from the consideration of such realities calls for reflection, courage, imagination and a high degree of mindfulness.

Many have expected efficiencies such as cost effectiveness and economies of scale through technology supported learning and teaching. Ehrmann (1991) argued that while new technology often increases capabilities of the teaching academic, new technology also leads to greater associated costs. Consequently, finding savings by substituting new technology for old is difficult and results should be sought in areas such as improved learner outcomes, program reputation and increased retention and enrolment which are long term and indirect benefits but are less likely to impress administrators. Bates (2000) provided guidelines for considering return on investment (ROI) though there are no easy formulae available to make cost estimates. This led Duke (2002, p. 125) to admit, ‘. . . we are very poor at knowing real costs, much less total benefits over time, direct and spin-off’, while confirming that the cost of developing a whole course for the internet is very high. Thus, new learning and teaching approaches may be regarded as cost efficient or expensive, and as increasing access to higher education or serving only an elite minority (Hülsmann, 2004). Such ambivalent claims only confirm the state of flux and the need for further studies in the area of costing.

Research is less effective if it is not set within a theoretical framework. Continuing to explore possible theoretical frameworks is valuable as frameworks provide representation of what is known about a specific area and therefore give a common
perspective and a vocabulary to understand that area. In an evolving field, improving the understanding in the area is necessary.

**Summary**

The literature shows that web-based learning and teaching is now an integral part of learning and teaching in many higher education institutions.

This chapter briefly described the lure of technology in higher education and its impact on universities, in general, and specifically in Australia. The different institutional strategies suggested in the literature for successful adoption of web-based learning and teaching were described as was technology’s impact on university teachers. The chapter then focused specifically on a few areas (developing new roles and skills, staff development, impact on time, research and rewards) where teaching academics have repeatedly commented that the impact of web-based learning and teaching approaches is most felt.

The chapter concluded with a review of emerging research trends in the area of web-based learning and teaching and noted the contribution to the literature of the many case studies which have established the possibilities for the research study described in the following chapters.
Overview

The objective of this study is to describe what influenced teaching academics as they adopted web-based teaching at Monash University. Educational technology is inherently an innovation-based field which has precipitated innovations in institutions as well as in the sequence and delivery methods of learning (Surry, 1997). This chapter explores the complexities related to the adoption of web-based learning and teaching and starts by describing theoretical perspectives on approaches to adoption and specifically on the institutional experiences of adopting learning management systems.

The chapter then moves on to build a theoretical basis for the study of teaching academics adopting web-based learning and teaching. The starting point for this is Rogers’ (2003) theory of diffusion of innovation which is used in several disciplines such as marketing, agriculture, medicine, and education to describe how innovations are adopted. However, the interview data gathered in this study demonstrated varied adoption approaches by individual teaching academics who were influenced by the socio-cultural aspects of a large, decentralised, multi-campus institution. The complex adoption environment highlighted a need to widen the interpretive base of the study and draw from other perspectives. As a result, actor-network theory was selected. This chapter presents a description of the two theories in order to explain the aspects of them that are relevant to this study. How the two theories are used in the analysis of the data is discussed in Chapter Five.

Adopting web-based learning and teaching

Technological innovation usually has some degree of advantage for the potential adopter but its benefits are not always obvious and not everyone is convinced that it is a better alternative to practices it will replace. There is uncertainty about consequences, doubt, even scepticism about any solution the new innovation may offer, and therefore there is
preceding information seeking activity to reduce the uncertainty. Robinson (2001) pointed out that any innovation that is disruptive to the existing system is complex, compels change at multiple levels and is culturally situated in the context of that institution. She argued that this has considerable consequences for the functioning of the organisation, its processes and its work practices as is with adopting web-based technologies for learning and teaching in universities. She warned that changes in learning and teaching methods or the adoption of new technologies are not simply technical changes confined to a single department, but involve changes in other departments and in the wider culture too: ‘It is not possible to introduce a change and at the same time keep other things the way they were’ (Robinson, 2001, p. 52).

**Approaches to adoption**

This section presents approaches to adoption of web-based learning and teaching related to higher education, as explained by different authors.

An iterative approach has proved to be a useful and cautious approach to incorporating web-based learning and teaching. Many are using a blended learning model by combining a traditional teacher-led class with synchronous and/or asynchronous web based approaches (Morrison, 2003). Blended learning allows both the teaching academic and the learners to gradually move from traditional classrooms to e-learning in small steps, making change easier to accept. An advantage of working with a blended incremental approach is that it enables both teaching academics and educational designers to develop the skills needed for e-learning in small increments. It is a process that gives professionals the opportunity to move small sections online as they develop e-learning skills while incremental change also gives the opportunity to reflect on and re-evaluate work. Blended learning is a highly practical approach to adoption (Morrison, 2003) but may lack the speed of adoption senior administrators desire. Berge (1998) warned that this approach of evolutionary incremental change may be inadequate to meet the competitive forces emerging in higher education which is more in need of re-engineering.
In a seven-nation study of 174 universities (including Monash University where the current study took place) Collis and van der Wende (2002) examined emerging use of information communication technologies in higher education and categorised them into four scenarios. The first was identified as ‘back to basics’ which is the current dominant situation where many universities are experimenting with technology. This scenario can lead to the fourth scenario, ‘the global campus’. Many universities are moving to the second scenario ‘stretching the mould’ which offers increased flexibility with or without change to the pedagogical mould. ‘The new economy’ scenario is the third scenario and is the radical extreme of individual flexibility and globalisation. Collis and van der Wende’s study reported three main findings: firstly, that change is slow and not radical though institutions are gradually ‘stretching the mould’, as they slowly make changes in their procedures and moulds from within, and adjust to demands; secondly, that while email, word processing, PowerPoint and use of the web had become standard aspects of the learning and teaching process, they have not radically affected it but are only gradually stretching on-campus practice while the lecture remains the core teaching medium; and, thirdly, that teaching academics are doing more with technology but with no particular reward and they are ‘stretching the mould’ using more technology but not making significant changes to their ways of teaching. These results are relevant to the current study.

Individuals approach adoption by moving between stages before committing to change (Wilson et al., 2002). They start with finding information, forming attitudes leading to commitment to new technology, before implementing and integrating the new practice. Individual and organisational learning occurs over time through the approach to and the process of adoption (Wilson et al., 2002).

**Adoption experiences with web-based learning and learning management systems**

As described in the previous chapter, a wide range of case studies about how a teacher or an institution has adopted web-based technologies to teach online is available. Most of these case studies report on how a specific technology was used and communicate the experience of the teachers in using the technology to teach. These case studies have
value as they document the experimenting teachers go through in adopting a technology that is new. What works, how it is used and what did not work is important knowledge that is shared by their authors. Laurillard (1993, 2002), however, offered a comprehensive teaching strategy that can be used as a basis for selecting learning technologies.

As new courseware delivery systems are adopted and implemented, experiences are shared with the community. In Australia, Engwirda and Jong (2001) reported on their experience of adopting Blackboard® (a commercially available learning management system) at Griffith University, Australia and highlighted training as an issue, first calling for training of trainers to train teaching academics. They acknowledged that they underestimated the scope of the change and the training, support and communication needed to facilitate change management.

Reporting the Murdoch University experience with the adoption of WebCT® (another commercially available learning management system), Phillips (2002) pointed out that crucial to facilitating adoption are central funding through which the university administrative systems are integrated with WebCT®, and staff development coupled with production assistance to teaching academics. McDonald and Postle (1999) reported on the adoption of web-based design at the University of Southern Queensland and used Kuhn’s theory of scientific revolutions (Kuhn, 1970) to describe organisational change.

A recent study conducted with teaching academics adopting a learning management system (WebCT®) at Manchester Metropolitan University, UK, described the adoption exercise as demonstrating ‘weak engagement’ with limited enthusiasm for e-learning (Naidu, 2004). The general unwillingness to change and move out of the comfort-zone, to develop new skills and competencies, detracted from key academic functions and was seen as a problem. In another UK study, Brown (2001) described adoption of a learning management system (WebCT®) at De Montfort University, UK, as a top-down initiative driven by a high level committee and facilitated at faculty level with the appointment of learning development managers, backed up by provision of central funding, promotion and staff interaction through conferences. He recommended strategic planning that tightly fits with plans that cascade down to individual faculties. Supporting structures
and processes such as assuring quality, staff development, reward programs and a strong sense of ownership were equally necessary to promote adoption.

Lammintakanen and Rissanen (2003) reported on the positive experience of adopting web-based education (WebCT®) at the University of Kuopio, Finland, but were cautious in their conclusions as outcomes of web-based education are as yet not well known.

These studies, though isolated, are important as they assist researchers to build on the work of others as they explore questions that are significant to them. They also increase the possibilities for generalisation and provide important pointers and lessons to other institutions planning technology adoption and diffusion.

**The theory of diffusion of innovation**

A theoretical explanation for adoption and innovation diffusion has been available since Everett Rogers’ theory of diffusion of innovation was first published in his seminal work, *Diffusion of innovations*, in 1962. It is now in its fifth edition (Rogers, 2003). This section reviews the key concepts put forward by Rogers.

According to Rogers (2003), an innovation is an idea, practice or an object that is new to an individual, and diffusion is the process through which the innovation is adopted by members of a social system or group. The main factors that influence the diffusion process are the innovation itself; how information about the innovation is communicated; time; and the social system into which the innovation is introduced.

Rogers’ diffusion theory is not one unified theory but consists of several interrelated theories, each focusing on an aspect of the innovation and diffusion process.

1. Innovation decision process theory suggests that diffusion is a process that occurs over a period of time and goes through the five stages of acquiring the knowledge related to the innovation, being persuaded by it, deciding to adopt, implementing the innovation, and confirming it. According to this theory, communication channels are important in diffusing information related to an innovation as communication creates
awareness, conveys information of the innovation to other potential adopters and explains how innovation adoption happens in an institution.

2. Individual innovativeness theory suggests that individuals predisposed to innovate are likely to be risk takers and pioneers who will adopt an innovation before the majority in the group. Persons are categorised as innovators, early adopters, early majority, late majority and laggards. Innovators are described as active information seekers of a new idea, who are extensively exposed to information and the media, with wide interpersonal networks extending outside their local circle and able to cope with high levels of uncertainty.

3. Rate of adoption theory suggests that innovations are diffused over a time period beginning with a slow growth before rapid growth takes place.

4. Perceived attributes theory suggests that potential adopters judge an innovation based on five characteristics that influence its uptake. Rogers listed them as

- Relative advantage – which is viewed in terms of time, costs, effectiveness, convenience, quality or results, social prestige, over what it the innovation replaces.

- Compatibility – which refers to alignment with existing values, practices, needs, past experiences and social norms.

- Complexity – which refers to perceptions about which the innovation is seen as being difficult to understand, learn and use.

- Trialability – which relates to the possibility to trial, experiment and reduce uncertainty and to learn by doing prior to adopting.

- Observability – which refers to the visibility of the results of adoption which stimulates discussion, interest and uptake.

In addition to the above four interrelated theories that compose Rogers’ theory of diffusion of innovation, he identified the concept of an ‘authority innovation decision’
which is a top-down directive that acts as an isolated yet commanding motivator to adopt.

**Diffusion theory and learning technology**

Rogers’ theory as illustrated by the many examples in his book, has been widely used in a range of disciplines to describe how innovations diffuse. The theory of perceived attributes has especially been used in several studies related to adopting learning technologies (Jacobsen, 1998; Shea, Pickett, & Sau Li, 2005; Sherry, 1998a, 1998b; Wilson et al., 2000).

While Shea et al. (2005) used Rogers’ diffusion of innovation theory to describe the adoption and diffusion of online teaching among 913 teaching academics, Rogers’ features of adoption are not specific to educational settings. Innovation adoption criteria described by Rogers as perceived attributes (simplicity, trialability, observability, relative advantage and compatibility), crucial to innovation adoption, are factors that focus more on the technology itself rather than the environment or external conditions and are therefore critiqued as a shortcoming by many (Ely, 1990, 1999; Stockdill & Morehouse, 1992; Surry, 1997; Wilson et al., 2002). While maintaining Rogers’ theory to be the foundation of explanations about innovation diffusion, and therefore useful to an extent, these authors have extended the theory to suit its application to technology related to learning.

Stockdill and Morehouse (1992) identified five *critical factors* which affect the successful adoption of an educational technology product. These are an educational need, user characteristics, content characteristics, technology considerations and organisational capacity. The element common to both Rogers’ model and the Stockdill and Morehouse model is the technology consideration which Rogers referred to as perceived attributes.

Ely (1990; 1999) described *conditions that facilitate the implementation of educational technology innovations* as the desire to improve; satisfaction and rewards; existence of knowledge and skills; and participation and status within faculty. He added the teaching
academic-as-adopter perspective to Rogers’ perceived attributes which is technology related.

Farquhar and Surry (1994) categorised the factors affecting the adoption of an instructional product into individual factors and organisational factors. They subdivided individual factors into user characteristics and perceived attributes. While user characteristics include psychological and physical characteristics of the adopter population such as motivation, anxiety, knowledge base, prior experience and skills level, perceived attributes are the same as Rogers’ list of perceived attributes. The organisational factors affecting the adoption of an instructional product were also subdivided into the physical environment and support environment, extending Rogers’ perceived attributes as did Stockdill and Morehouse (1992) to include contextual conditions.

Wilson et al (2002) complemented Rogers’ criteria by identifying support as an additional factor. Support includes financial support, training, time, and energy as well as administrative and political support, again including contextual conditions.

Figure 4.1 shows how the contributions of Stockdill and Morehouse (1992), Ely (1990; 1999) and Farquhar and Surry (1994) employed Rogers’ theory as the central foundation to describe innovation diffusion related to learning technology products.
Figure 4.1 Rogers’ theory used as the central foundation

The current study draws from Stockdill and Morehouse (1992), Ely (1990; 1999) and Farquhar and Surry (1994) and extends Rogers’ theoretical framework as presented in Table 4.1. While Table 4.1 demonstrates how the authors perceived key gaps in Rogers’ perceived attributes, more importantly, it shows how an Integrated Theory of Diffusion of Innovation will form part of the analytical framework for this study.
Recently Surry, Ensminger and Haab (2005) drew on the same literature sources and proposed the RIPPLES model – RIPPLES being the acronym for resources, infrastructure, people, policies, learning, evaluation and support. While grounded in theory, the authors admit that the model is still in its early stages and is yet to be tested.
Collis and colleagues (Collis & Moonen, 2001; Collis et al., 2001) proposed a model to predict the possibility of adoption and diffusion of telecommunications related technological innovations (email, World Wide Web and teleconferencing, in particular) in learning settings. Referred to as the 4E model, it includes environmental factors, effectiveness, ease of use (personal) and engagement (institutional) and is different as it is a model to predict innovation adoption as against a model that describes innovation that has previously happened. They argued that the 4E model provided an analytical model to predict implementation strategy and the diffusion of information communication technology use in educational contexts. Though this model made no direct reference to Rogers’ theory, the factors ‘effectiveness’ and ‘ease of use’ could be argued as covering Rogers’ perceived attributes. The other two components (‘environmental factors’ and ‘institutional engagement’) cover contextual factors.

**Diffusion theory and context**

Diffusion theory has been applied to learning contexts in several different ways. The lack of attention to context in Rogers’ model was pointed out by Sherry, Billig, Tavalin and Gibson (2000) who argued that Rogers’ diffusion of innovation framework needed extension in order to better describe systemic processes which include technological, pedagogical, individual and institutional factors and interactions. This clearly indicated that including context is important when studying adoption of a learning innovation.

Surry (1997) divided application of diffusion theory into two categories – macro theories and micro theories. Macro theories focus on institutional change and restructuring of educational institutions as a result of adoption of technologies, and are generally broad in scope. They refer to systemic change and the adoption of a range of technologies (for example, see Reigeluth, 1987). Micro theories centre on the adoption of a specific learning technology or product amongst a specific set of possible adopters. The focus is on a individual innovation in a particular environment and is therefore at a micro level (for example, see Sherry, 1998a, b).
The current study falls into both categories. While at a micro level it explores the adoption of web-based teaching approaches of individual teaching academics, at a macro level it also explores institutional and systemic impact and change.

From a theoretical standpoint, views related to technology adoption range across a continuum of technology determinism to technology instrumentalism. A Utopian determinist model draws on the idea that technology is the major force behind change, economic growth and the betterment of society while the dystopian determinists take the view that technology has a dehumanising effect. Opposed to the views of the determinists are instrumentalists who consider technology only as a tool which is very much under a person’s control and can be used for either positive or negative effect. These views led Surry (1997) to categorise information technology related diffusion research as explained in Table 4.2.

Table 4.2  Categories of information technology related diffusion research (Surry, 1997)

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<th>Macro level or systemic change</th>
<th>Micro level or product utilisation</th>
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<tr>
<td>Developer - Determinist</td>
<td>Focus on structure, establishment of an organisation</td>
<td>Focus on process of designing, developing and evaluating effective learning products</td>
</tr>
<tr>
<td></td>
<td>Top-down reform</td>
<td></td>
</tr>
<tr>
<td>Adopter - Instrumentalist</td>
<td>Focus on the social, political and professional environment in specific organisations</td>
<td>Focus on the needs and opinions of potential adopters and characteristics of the adoption site</td>
</tr>
<tr>
<td></td>
<td>Bottom up reform</td>
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The developer-based determinist model in learning technology assumes that the best way to bring about educational change is by creating a system that is significantly superior to what is in existence on the assumption that potential adopters would be predisposed to adopt a superior product. In a top-down approach, institutional administrators promote technological superiority to bring about adoption. In order to
better understand the adoption of web-based teaching by teaching academics in this study, contextual influences need to be included. Rogers explained the non diffusion of the Dvorak keyboard despite its efficiency and advantage over the common QWERTY keyboard found on every typewriter and now on every computer (Rogers, 2003, pp. 8 - 11) and pointed out the contextual implications that impinged on that outcome (David, 1986). The limitation of this deterministic bias is that technological superiority alone does not guarantee adoption and Rogers’ perceived attributes takes a technological perspective.

Segal (1994, p. 2), stressing the importance of context, commented that ‘all structures and machines exist in a social context and, unless designed for the sake of design itself, serve a social function’. The significance of social factors and their interplay with human and interpersonal factors was also pointed out by Tessmer (1990). Surry (1997) also warned that there was no danger in being driven to improve society by improving instructional technology, but that the real danger was to ignore the society we are attempting to improve.

A large study conducted in the UK (Robinson, 2001) concluded that there were four main areas of concern regarding technology adoption – resource availability, organisational issues, human resource capacity and the use of the technology. These findings show considerable consistency with other studies conducted to identify problems and barriers related to adopting a new technology.

Some influences on technology adoption are about technology itself, others are about the prospective users while some fall into the category of local contextual factors. Adoption depends on the shared negotiation of values and properties. For example, a study conducted at the University of Alberta found that no amount of support and encouragement helped to reduce the divide between early adopters and the mainstream faculty (Anderson, Varnhagen, & Campbell, 1998).

Rogers explained that innovation adoption does not happen evenly and uniformly through the ranks but takes the form of a bell curve pattern where early adopters, mainstream adopters and laggards (the diehards) are differentiated. It is the same with
regard to adoption of innovative information and communication technologies (Garrison & Anderson, 2000; Geoghegan, 1994). Geoghegan (1994) identified four factors that exacerbated the divide between the early adopters and mainstream faculty:

1. the assumption by administrators and change agents that teachers are a homogeneous group;

2. the technological alliance between hardware and software developers and the early adopters who form an elite group that maintain control;

3. the feeling of alienation by many teachers that the new technologies as dehumanising and incompatible with what teaching and learning should be about; and

4. the lack of a compelling reason to change – no relative advantage, inability to trial, lack of incentives, lack of exposure.

Hence, the theory of diffusion of innovation is regarded in this study as limited as it is only capable of describing innovation diffusion from the perspective of technology attributes of the innovation. The fact that these technology attributes are reported through perceptions of adopters, contributes a further layer of limitation. Since the theory of diffusion of innovation is deficient in not taking into consideration social, political and contextual factors, the current study draws on actor-network theory to accommodate these aspects.

**Actor-network theory (ANT)**

As indicated earlier, the purpose of this section is to introduce actor-network theory and its key concepts. This theory, together with the theory of diffusion of innovation, will be used to interpret the results of this study.

**Overview of Actor-network theory**

Actor-network theory emerged in the 1970s from two related but distinct fields, the social practice of science and technology studies (Underwood, 1998). Its key assumption
is that production of scientific knowledge is influenced by social factors. It provides a way of understanding the ‘co-evolution of society’ with technological artefacts and knowledge of nature (Callon, Law, & Rip, 1986). It has been used to describe a wide range of innovations (including technical innovations) such as the development of the electrical vehicle in France (Callon et al., 1986), the domestication of the scallops and fishermen of St Brieuc Bay (Callon, 1986), the role of general practitioners in the UK cervical cancer screening program (Singleton & Michael, 1993), and the introduction of multimedia products in primary schools in Australia (Bigum, Green, Fitz Clarence, & Kenway, 1993). In the story of Aramis, a guided rapid transport system intended for Paris, actor-network theory was used to relate a technological failure and a dream gone wrong (Latour, 1996). It has proven to be a useful theoretical framework to describe information systems (Monteiro & Hanseth, 1996; Walsham, 1997), examine innovation in education (Bigum, 2001; Gilding, 1996; Rowan, 2001; Rowan & Knight, 2001; Simpson, 2000, 2001) and analyse learning environments (Thomas & de Villiers, 2002), including e-learning and flexible environments (Roberts, 2004) and the adoption of e-learning technologies and e-commerce by older people (Tatnall & Lepa, 2003). Aspects of actor-network theory have been used to critique networked learning (Fox, 2002), to improve the understanding of communities of practice (Fox, 2000), and more specifically, to examine the idea of community in networked learning in higher education (Fox, 2005).

In actor-network vocabulary, the terms *actors* or *actants* represent any physical entity (Callon et al., 1986). Therefore, all stakeholders or participants are referred to as actors or actants and may be human or non-human (Akrich & Latour, 1992). Consequently, an actor is a useful abstraction that facilitates the analysis of situations when dealing with heterogeneous entities (Law, 1992).

According to Law (1992), an actor is a *network* that has been reduced to a single identity and action. Callon (1986) explained that an actor is at an intersection of two networks – one it simplifies and one simplifies it. Actor-network theory assumes that the social world is materially heterogeneous (Law, 1992), and therefore the network of actors is composed not only of people but also of machines, texts, funds, organisations,
legislations, etc. Social relations such as power, inequality and organisation are considered as network effects that are generated when actors interact. Consequently, the context is a complex structure of the actor-network which includes the shifting alliances, interactions and negotiations between and among the numerous actors. A network, therefore, consists of several enrolled actors who negotiate and impose roles on other actors (Tatnall & Lepa, 2003). A socio-technical network, according to actor-network theory, relates machines, people, software, institutions, protocols and bureaucracies to one another. Actors of such a system achieve ‘translation’ through negotiation, calculation, persuasion, and even violence, through which those actors’ interests are articulated (Arnold, 2003).

All actors have scripts or represent scripts and embody a pattern of use or behaviour (Akrich & Latour, 1992; Latour, 1992). The program of action occurs under a wide range of conditions and factors that interlink, to influence that act, and form the actor-network. It consists of different influences, interconnections and negotiations among the different human and non-human actors. Their negotiations and interactions form the program of action.

Actor-network theory treats all actors and all outcomes equally. Therefore, all actors, whether they are human or non-human, receive symmetrical and equal treatment and weighting (Latour, 1992), which suggests that they should all be studied in the same way (Klecuñ, 2004). Causality is treated with symmetry as are the failure and success that are its outcomes. This enables identification and realistic representation of power relations. Power is viewed not as a quality that is held by a particular actor, but as something other actors react to which is part of a network (Latour, 1986). Social relations are treated similarly.

Actor-network theory does not categorise or label actors. Nor does it attempt to describe or quantify the size of a network. It merely attempts to explain how a network grows in influence or contacts and focuses on the process rather than the results (Fox, 2005). It suggests how to study the social world rather than how the social world is (Latour, 2004) which prompted Klecuñ (2004) to conceptualise actor-network theory both as a theory as well as a methodology.
Innovation is not viewed as a linear process which goes through a series of stages. Instead, actor-network theory views all processes as a whole, as they develop or do not develop (Simpson, 2000) as in the case of Aramis, the guided rapid transport system designed for Paris, which was a major innovation that was abandoned for political reasons but regarded as a technological failure (Latour, 1996).

**Actor-network theory and the current study**

The current study consists of many actors: teaching academics, IT support persons, individual workloads, training programs, policies, time, and web-based technologies are some actors in this study. The changing work practices of teaching academics as they adopt web-based learning and teaching approaches form the process or the *program of action*.

The adoption of web-based learning and teaching approaches by teaching academics does not happen in a vacuum but in an environment that consists of an interplay among a range of actors (Hanseth & Monteiro, 1998). Actor-network theory groups these actors together and treats them all – human and nonhuman, equally and with symmetry, regardless of the unit of analysis. The fact that actor-network theory draws on context-specific detail makes it eminently relevant as a theoretical lens for a case study. The production of knowledge is influenced by social factors (Law, 1986) and actor-network theory views those influences as something to be explained rather than an explanation itself. Latour (2004) advised against imposing frameworks when presenting findings, and suggested that thick description provides insights into the situation under study. In a study such as this, actor-network theory offers an interpretive lens to provide the rich, fine-grained information that contributes to the detailed account of the context. It allows for an improved understanding and description of the context and the study question. Actor-network theory allows certain key questions to be answered, such as how something came to be this way; who the key influences are; and, reasons for some actors acting as they did (Underwood, 1998). In relation to the current study, a description of the changing alliances and interplay between actors forms a description of how things came to be this way. In discussing and exploring the question ‘who is influencing it?’, the varying actors and the scripts they play including technology’s impact are
considered. In considering ‘why some actors act in a particular way’, the study reflects on the nature of the scripts they perform.

Technological innovation brings together interested people, all of whom have to be evaluated together as Latour (1996) demonstrated in reporting technological failure in Aramis, mapping out the interests of humans as well as interests and attachments of non-humans. However, actor-network theory has been critiqued for treating humans and machines equally. It has been declared amoral, encouraging the devaluation of humans (Walsham, 1997). Though it may be practical to consider machines and humans equally, they are in no way identical (Underwood, 1998). By drawing on and using the descriptors in the theory of diffusion of innovation (Table 4.1), this study will describe the human actors in this study – the individual teaching academics, and attempt to overcome the main criticism levelled at the actor-network framework.

**Diffusion of innovation and actor-network theory**

The aim of the current study is to use aspects of actor-network theory (also known as the theory of translation), and Rogers’ theory of diffusion of innovation (Rogers, 2003) and its extended interpretations offered by Stockdill and Morehouse (1992), Ely (1990; 1999) and Farquhar and Surry (1994) (referred to as the Integrated Theory of Diffusion of Innovation) to interpret the influences and forces that shaped the reactions of those in this study. For this purpose, the vocabulary of these two theories is used and relevant aspects of each of them are used to understand and describe the findings in Chapters Seven and Eight.

The two theories differ in the ways they treat data (Simpson, 2001) and the approach they adopt to interpret the data. While diffusion of innovation takes a cause and effect approach to the treatment and explanation of events, actor-network theory takes an analytical approach to the interactions and negotiations of the innovative process, offering a way of describing the interwoven organisational issues (Monteiro & Hanseth, 1996) and avoids giving frameworks or steps to follow. Therefore, the two theories are used to describe the data in this study in two different ways. This approach is adopted to provide a more comprehensive description of the study question.
Summary

This chapter has described innovation adoption, specifically the adoption of web-based learning and teaching by teaching academics, by reviewing several theoretical approaches to the adoption of web-based learning and teaching, and institutional case studies of adoption, before describing Rogers’ theory of diffusion of innovation. The contributions of Stockdill and Morehouse (1992), Ely (1990; 1999), Farquhar and Surry (1994) and Sherry et al (2000) expanded the general diffusion of innovation theory to the Integrated Theory of Diffusion of Innovation as Rogers’ theory was found to be inadequate in its application to educational technology adoption situations. The chapter then reviewed the key concepts of actor-network theory to complement the other theory in interpreting the findings. This combined analytical approach is described in Chapter Five.
Chapter Five – Research Procedure

Overview

This chapter continues the discussion initiated in Chapter Four and explains how the two theories, the Integrated Theory of Diffusion of Innovation and actor-network theory inform the research procedure used in this study. This chapter also describes how the two theories form the basis of the interpretive framework used in Chapters Seven and Eight to report on the findings.

While including the rationale and the specific research procedure that supported the study, this chapter also includes a description of the methods and procedures used, and the ethical considerations, as well as an explanation of the analysis process and the means of establishing validity and reliability.

How diffusion theory and actor-network theory are used in this study

The aim of the study is to examine the influences on adoption of web-based learning and teaching approaches by teaching academics at Monash University. This is the key driver of the analytical framework which is described in this section. The study relies extensively on the rich descriptions of subjective experience of human behaviour and the context. This section of the chapter describes how the two theories described in Chapter Four relate to the current study and its research procedure.

Rogers’ theory of diffusion of innovation has been widely used in research studies in large corporate organisations such as General Electric, Xerox, the Royal Navy, and in investigating large groups such as adopters of mobile phones and organic farmers (Rogers, 2003). Since the current study is a small study consisting of twenty-two individuals in a single institution, detailed data matter, and therefore, actor-network theory is employed. Drawing from both the theory of diffusion of innovation and actor-network theory is an approach that was taken in the Queensland ConnectEd project (Simpson, 2000). The current study also uses both theories in order to widen the range of
descriptions and gain a finer insight into the context under description. Consequently, the interpretive framework is based on these two theories.

Diffusion theory, widely used in areas relating to education and technology (Jacobsen, 1998; Sherry, 1998a; Sherry et al., 2000; Wilson et al., 2000; Wilson & Peterson, 1995), is used in this study to interpret teaching academics’ reflections on their experiences of innovation adoption and to describe cause and effect. Since the actor-network framework does not give priority to the human actor, the individual teaching academics’ interview data will also be analysed using the Integrated Framework of Diffusion of Innovation (described in Chapter Four) that extended Rogers’ theory. This approach gives due consideration to the teaching academics’ role and experience in their adoption of web-based learning and teaching approaches. Any gaps in the actor-network framework are therefore suitably addressed.

Had the theoretical framework been limited to the theory of diffusion of innovation, using Rogers’ categories, the study would be limited to Rogers’ categories (Jacobsen, 1998). Similarly, limiting the theoretical framework to the Integrated Theory of Diffusion of Innovation described in Table 4.1 would be limiting it to those categories. The theory of diffusion of innovation has a pro-innovation bias as it describes how an innovation is adopted and diffused through the system. To restrict any such bias, the analytical approach in this study also uses actor-network theory that has been used to describe not only successful innovation adoption but also to describe technological failure as in the case of Aramis (Latour, 1996), a narrative described from the perspective of its many stakeholders.

Contrary to Rogers’ diffusion theory model, this study makes no attempt to categorise teaching academics according to their innovativeness or level of adoption and label them as change agents, opinion leaders or laggards. While such categorising would serve no purpose in this study, categorising has also been questioned and critiqued by actor-network theorists (Fox, 2005; Simpson, 2000). This study does not offer an adoption model for an innovation but defines conditions that promote or deter innovation adoption in the study context. The study also avoids the linear explanation of diffusion as a process going through the stages of acquiring knowledge related to the innovation,
being persuaded by that knowledge, deciding to adopt, implementing the innovation and confirming it, which was deemed imprecise by Simpson (2001) and was also unsuitable given the purpose of the current study.

In this study, the individual teaching academics will be described according to the descriptors derived from Integrated Theory of Diffusion of Innovation introduced in Table 4.1. The same table is presented as Table 5.1 with those descriptors that will be used to describe and provide more information on the individual teaching academics shaded in grey.
## Table 5.1 Descriptors derived through the Integrated Theory of Diffusion of Innovation

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Perceived Attributes</strong></td>
<td>Relative advantage</td>
<td>Technology considerations</td>
<td>Perceived attributes</td>
<td></td>
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<tr>
<td></td>
<td>Compatibility</td>
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<td>Complexity</td>
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<td>Trialability</td>
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<td></td>
<td>Observability</td>
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</tr>
<tr>
<td><strong>Categories added to extend the theory of diffusion of innovation to learning technologies</strong></td>
<td>Educational need</td>
<td>Desire to improve</td>
<td>User characteristics</td>
<td>Satisfaction and rewards</td>
</tr>
<tr>
<td></td>
<td>Content characteristics</td>
<td>Organisational capacity</td>
<td>- Existence of knowledge and skills</td>
<td>- Resources</td>
</tr>
</tbody>
</table>

The non-shaded areas (bottom row) of Table 5.1 are the organisational factors that form the influencing and contributing background to individual adoption of web-based learning and teaching approaches. This is the social system described by Rogers which is the environment within which the innovation is adopted. In organisations the social system is influenced by its formal and informal structures and its hierarchy, which in
turn shape interactions. The teaching academics in this study work in the ten faculties of the university across several campuses and are governed by the structures, norms and hierarchy of their faculties. This context is described in Chapter Six.

As explained in Chapter Four, the non-human organisational factors will be considered as ‘actors’ and actor-network theory will be used in this study to follow the involvement of these actors and to document their interactions and negotiations: ‘To balance our account of society, we simply have to turn our exclusive attention away from humans and look also at non-humans’ (Latour, 1992, p. 227).

Some of the non-human actors in this study are the faculties the teaching academics belong to, university and faculty policies, discipline-based research, unstable technology, funding, individual workloads, work practices, rewards, training programs, time and the learning management system. These are considered as influencing and contributing factors in relation to adopting web-based learning and teaching approaches by teaching academics.

Actor-network theory has been critiqued for being apolitical and lacking an evaluative stance that would help with making judgements (Klecuń, 2004). However, because it relies on thick description from human and non-human actors, it is used in this study to facilitate the readers’ ability to come to their own understandings. Actor-network studies have also been critiqued for being too local and ignoring the wider social environment (Walsham, 1997). Considering that this is a case study that is limited to Monash University, this critique, though valid, does not apply.

The current study was not set up as an investigation of an actor-network and this is therefore not its main theoretical framework. Actor-network theory is used in the study only as an interpretive lens. This approach of not framing a study using actor-network theory but using aspects of it as an interpretive lens was also adopted by Busch (1997), who examined curriculum revision and change to problem based learning in two medical schools. Attempts to explain a curricular change have most often focussed on individuals – the faculty members, the dean or an administrator. By applying the actor-network...
perspective, Busch argues that a fresh perspective on humans as well as non-human actors is possible. This approach is pertinent to the current investigation.

The two frameworks are used together to describe the teaching academics’ moves, negotiations, strategies, approaches and compromises through the process of adopting web-based learning and teaching approaches, including their network-building, and the roles and the power relationships that control these actors. Actor-network theory provides for ‘following’ actors and their interactions and translations, in order that the situation is better understood (Klecuń, 2004). (Chapter Eight describes the findings from an actor-network standpoint which does not provide for bias or preferential treatment for humans.) The two theories used together provide an additional dimension of information which relying on a single theory may otherwise exclude.

The next section describes how the study was designed and the reasons for the selected approach.

**Rationale for the case study**

The focus of the study was a single entity or a case within a bounded system (Stake, 1980). By confining the study to the institution, this formed its unity and wholeness. The search was for patterns and meanings within those confines.

While the case study method suits the interpretive framework of diffusion of innovation theory, at a theoretical level, the idea of boundaries conflicts with actor-network theory which describes actors as having networks that extend outwards while each actor also has its own intermediaries and a set of relationships that brings actors together (Callon, 1991). These actors are comparable to ‘black boxes’ (Tatnall, 2003): when the lid is opened, more complex networks are displayed, which do not form a part of this study. These ‘enrolling intermediaries’ from other networks go beyond the discipline (of the current study), extending the network and are therefore not included. Though Callon (1986) suggests that these other actors should be followed, this study follows the advice of Tatnall and Lepa (2003), and uses the actors relevant to this study only (not the enrolling intermediaries) to set a framework and boundaries for the current study.
Imposing boundaries is a logistical necessity: ‘Since every study has to limit its scope, why not encompass it within the boundaries proposed by the interviewees themselves?’ (Latour, 1996, p. 19)

The boundaries of the current study are explained in the next section.

**Research context**

Context is not something separate in actor-network theory. However, as explained above, this study was not set up as a study of an actor-network and therefore context is part of the scope of this study, and as a consequence, is relevant. The study was bounded as follows.

**Setting** – The study was conducted at Monash University and included participation from staff in all ten faculties. The university is a multi-campus institution with six campuses in the state of Victoria, Australia and two overseas (Kuala Lumpur and Johannesburg). The two overseas campuses were excluded from the study for logistical reasons. This study context is described in detail in Chapter Six.

**Participants** – Twenty-two staff members from all faculties and all Victorian campuses participated. Participants ranged from senior academics and research fellows to newly starting lecturers and teaching and learning/flexible learning administrators. (Boundaries related to participants are discussed in detail under the section ‘Sample’.)

**Events** – The events studied were the influences on teaching academics’ adoption of web-based learning and teaching approaches and their descriptive perceptions of their journey into this innovation.

**Processes** – Particular attention was paid to the process they went through (e.g., staff development) in adopting innovative learning and teaching approaches.

**Ethical considerations** – Ethical permission was obtained from Deakin University Ethics Committee. Since the research study took place at Monash University, ethical clearance was also obtained from Monash University. (See Appendices 1 and 2.)
Chapter Five – Research Procedure

The study was designed to draw information from individual teaching academics in order to explore their reasons for adoption of web-based learning and teaching approaches, including the factors that contributed to their innovativeness and the constraints that they experienced. The study was designed to optimise information about the understanding of the individual teaching academic as well as about the group of participants. Thus, the knowledge gained through the individual participants was used to generalise about the adoption of web-based learning and teaching approaches of the selected group of participants and the discipline areas they represented. It was also considered that if further studies were to be conducted on this theme, this case study data and findings would complement quantitative data very well and form the basis for an institution-wide larger study.

The research design and method

An overview of the theoretical basis and methodological paradigm of this study was provided in Chapter One which explained the rationale for the use of naturalistic inquiry within the constructivist interpretive paradigm.

As stated in the previous section, the research design provided for the exploration of individual teaching academics’ reasons for adopting web-based learning and teaching approaches, including factors that contributed to innovation at a particular time, and the constraints they experienced. The knowledge gained explains (through generalisation) teaching academics’ adoption of web-based learning and teaching approaches at Monash University (which is the case for the study).

In addition to the reasons for selecting the case study method listed in Chapter One, the following additional reasons are relevant for this case study:

1. The method supported the goals of this study which were to understand and confirm what is known (Stake, 1978) and obtain a snapshot of a situation in a given time, in relation to the research question.

2. It was the approach that best explored a situation which survey methods and experimental strategies (which provide clear outcomes) could not accommodate. It
offered the possibility of exploring and describing a real life situation together with all the contextual conditions which were an important part of this study.

3. The method made it possible to capture the knowledge gained through vicarious experience which is a different form of knowledge from that which is a result of empirical research. These are ‘self generated knowings’ (Stake & Trubull, 1982, p. 5) which include the subject’s view of the world, their experiences and tacit knowledge. The method accommodated the existence of qualitative differences in the way teaching academics adopted and adapted to web-based learning and teaching approaches through the use of direct testimonies or interviews. By examining and describing the individual experiences of teaching academics, new understandings of web-based learning and teaching adoption within Monash University are constructed.

4. The case study method was selected because, as demonstrated by Abramson (1992), it offers a rich source of information providing insight into the inner subjective world of a person. It was used in this study to expose views about teaching academics’ experience, situations, problems and roles, and illuminate the causes and meanings of those experiences and situations in order to portray the innovative, pedagogical and technological world they inhabited.

5. The case study method provided for the study of the particular and was selected to study what is specific to the institution. No other research method allows this degree of focus on an individual case. Each individual teaching academic contributed to building the case that was the institution (Stake, 1980). The institution was also the bounded system of unity or totality in a particular circumstance, interacting with a particular problem, exercising certain behaviours and forming the case.

6. Each individual teaching academic needed to be understood clearly in order to understand the complex influences on adoption of web-based learning and teaching approaches. Together they composed a larger case which was the institution. The individual cases allow the recognition of the particular and provide for a better understanding of the context within which the teaching academics adopted web-based
learning and teaching approaches. The approach was therefore seen as a method of adding to experience and improving understanding (Stake, 1978).

7. The expectation was that the information generated from this study would further understanding, especially of individuals in higher education, communicating with them in a way that was aligned with their current understanding. Case study reports were believed to be more in harmony with the experience of people in general, and therefore a basis for generalisation about them (Stake, 1978). Since the case study method is about presenting information through people’s rich descriptions and experiences, it was seen as an effective means of accessing and reporting on these experiences. Rich descriptions provide more compelling reading than statistical data.

Consequently, the study was designed to facilitate understanding of the influences on the adoption of web-based learning and teaching approaches in the institution through the views of individual teaching academics based in all the faculties. The case study approach provided a specific way of collecting and organising the required data.

By designing the study as a multi-site qualitative study, the intent was to optimise and strengthen the in-depth rich descriptions. This was achieved through addressing the same research questions at a number of sites, and using the same data collection and analysis procedures for each participant. The approach required that the data collection was structured as much as possible so that cross-site differences and similarities were characteristics of the sites and not caused by the research procedures. The standardisation extended to administering the same interview questions in the same sequence. However, in the process, when unique aspects in an individual teaching academic were noticed, these were not overlooked but probed for further information. The additional information thus obtained contributed to the uniqueness of that individual. This required that issues were well thought out before hand.

Contributing to the rationale for the design issue was the assumption that, by including many teaching academics, generalisability was increased (Kennedy, 1979). Harriott and Firestone (1983) warn that multi-site studies run into the danger of selectivity in sites in order to reduce data complexity at the expense of representativeness. However, this
study represented all faculties and all Australia-based campuses of the particular university so that faculty-specific information would contribute to the multiple facets of the case.

**Sample**

The study used purposive sampling techniques where participants were selected on the terms of specific characteristics (Patton, 1990) because a random selection approach would not have identified innovative teaching academics only. ‘Selection’ of a sample is not a common concept in actor-network theory because all actors are equally treated, though key informants were selected and interviewed and key documents were reviewed in the actor-network case study by Latour (1996). Participants selected in this study were all key informants who understood the research question and therefore were capable of a valid response.

For the current study, the criteria for participant selection were that

- the unit each participant taught had a website which gave the individual the experience and the ability to comment;
- they were either the early adopters of web-based learning and teaching approaches in their faculty or were among the early mainstream; and
- all faculties were represented which gave maximum variation and the possibility of identifying common patterns.

Following the advice of Miles and Huberman (1994), maximum variation in purposeful sampling was achieved by including teaching academics from all faculties to identify multiple perspectives on a common issue. Their suggestion to use a snowball or chain approach to sample recruiting led to requesting the flexible learning managers in the faculties to nominate participants who matched the criteria. The snowball or chain effect resulted in the nomination of people who knew participants, particularly from three faculties. As a result, the approach was opportunistic, taking advantage of new leads. As suggested by Miles and Huberman, care was taken to include extreme and deviant
participants such as early adopters, and typical cases such as mainstream, normal, average participants. In combination, these participants were expected to give a more balanced understanding. A few were selected because they were politically important to the faculty and were held up (in their respective faculties) as exemplary in their practice. Following the advice of Yin (2003), all participants were unique, representative and/or critical which provided a reason or purpose for their inclusion in the study.

In addition, Monash University’s Centre for Learning and Teaching Support (CeLTS) e-learning training team provided a list of persons who had completed training in the use of the learning management system. Innovative teaching academics from this list were highlighted by the training team and all these persons were invited to participate via email. All those who agreed to participate were interviewed.

This approach resulted in a total of twenty-two participants from ten faculties across six campuses. Table 5.2 illustrates the distribution. (Pseudonyms have been used to protect identity and maintain anonymity.)

Table 5.2  Distribution of participants across the ten faculties

<table>
<thead>
<tr>
<th>Arts</th>
<th>Art &amp; Design</th>
<th>Business &amp; Economics</th>
<th>Education</th>
<th>Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betty</td>
<td>Don</td>
<td>Jenny</td>
<td>Patrick</td>
<td>Angus</td>
</tr>
<tr>
<td>Thomas</td>
<td></td>
<td>Pauline</td>
<td>Rose</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Samantha</td>
<td>Ted</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Technology</td>
<td>Law</td>
<td>Medicine, Nursing &amp; Health Sciences</td>
<td>Pharmacy</td>
<td>Science</td>
</tr>
<tr>
<td>Marg</td>
<td>Penny</td>
<td>Carmen</td>
<td>Louisa</td>
<td>Karim</td>
</tr>
<tr>
<td>Ben</td>
<td>Steff</td>
<td>Anna</td>
<td></td>
<td>Sheryl</td>
</tr>
<tr>
<td>Information Technology</td>
<td>Simon</td>
<td>Anna</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sally</td>
<td></td>
<td></td>
<td>Pete</td>
</tr>
</tbody>
</table>

**Data collection procedures**

Data collection procedures were first established by setting the boundaries for the study (outlined previously) and establishing a protocol for information collection. Data were collected in three main ways – (1) through semi structured interviews, (2) through examination of artefacts and web-based learning resources, and (3) through field notes.
The three-way data collection method was provided for triangulation to enhance the trustworthiness of the data.

**Interviews**

The interviews were conducted to establish teaching academics’ perceptions, attitudes and approaches to adopting web-based learning and teaching approaches.

The interviews were conducted face-to-face in each teaching academic’s own room at a time convenient to them. Each interview was semi structured with mostly open-ended questions and took from one to one and a half hours. The interview questions were about the teaching academic’s adoption of web-based learning and teaching approaches. Table 5.3 shows how the interview questions were arranged according to the question categories of Patton (1990). (See Appendix 3 for the questions). A standard open ended set of questions was used in the same sequence with all participants. This enabled similar information to be obtained from all participants and reduced bias from gaining different information through different questions. Since the questions were open ended, they allowed the flexibility to follow up additional useful information that surfaced within the interview discussion. This occurred through further unstructured questioning.

The interview style was conversational. Prior to the interview, all participants were sent individual emails confirming the date, time and place of the interview. The email also outlined the purpose and aims of the study, gave an overview of the focus of the interview and assured anonymity. Though participants were aware of the purpose of the study, this email was seen as preparing each participant for the interview.

All interviews were audio taped, transcribed and the transcriptions sent to each participant to verify and accept before analysis.

**Supporting documents, websites and artefacts**

Interviews were followed by analysis of supporting documents. The teaching academics spoke of their web-based teaching approach but the level of complexity and the extent of the interactivity could only be demonstrated through the related websites and print
materials. Therefore, following each interview, the supporting evidence, such as related web-based learning and teaching materials, was examined together with any printed learning materials to verify and substantiate interview statements. Other physical non-interview data examined included already mentioned, handouts, PowerPoint slides and a set of videos on CD. All these items were developed by the teaching academics to complement and support their web-based learning and teaching approaches.

Field notes and observations

Notes taken during each interview were typed up as field notes and observations. These were mainly descriptive notes such as a portrait of the participant, a description of the physical setting, accounts of activities that surrounded/interrupted the interview, and reflective notes such as personal thoughts or feelings, ideas and impressions. They also included demographic information such as date and time, place of interview, number of years as a university teacher and the number of years of experience teaching online, unit codes and titles and also URLs to obtain access to the relevant websites. Observations related to each individual’s web-based learning and teaching approach and other supporting study materials were also part of these filed notes. (See Appendix 4 for an example.)

Further questions arising from the interview and reflections were clarified via email. Those clarification exchanges were maintained as part of the data belonging to that participant’s folder.

Data management

NVivo® software was used for data organisation, storage, management and retrieval. It provided the storage system for all the source data (the interview transcripts, downloaded websites, memos and field notes). These source data were organised into specific folders that stored documents and files related to the individual teaching academic. Specifically, NVivo® was used to organise and archive the entire transcripts of all the interviews. All teaching academics’ folders included an interview transcript
file, a field notes file, memos which consisted of email exchanges, observations, and learning and teaching materials.

NVivo® performed the function of documenting the analysis carried out and providing the facility to maintain links between this original data and the interpretive statements, themes, categories and tree structures they were organised within. The processes involving the recognition of categories in the data, generating ideas about them and exploring the meanings in the data demanded data management. While the discovery and recognition of categories were important, the need to store this information with its links to the data source was crucial and NVivo® controlled this. Thus, NVivo® helped in exploring patterns and maintaining access to data (Richards & Richards, 1994). While category generation is not consistent with the actor-network analytical framework as explained previously, the current study was not set up as a study of an actor network, but rather it was possible to use the advantages of category generation to assist with the organisation and management of the data, as well as to assist with the analysis of the data, and only draw on actor-network theory for interpretation of the findings.

In addition to the above, a physical filing system organised the raw field notes, hard copies of transcripts, audio tapes, print outs of websites and other learning resources.

**Measures taken to enhance credibility and trustworthiness**

Following the advice of Lincoln and Guba (1985), the current study carried out in a large institutional context, involved multiple participants in multiple settings in order to enhance credibility and trustworthiness. The participants were found to be similar to some (participants) but different to others. Consequently, there were clusters or families of participants. Like all cross-site analytic work, this study was not simple and while comparisons are possible for generalisation purposes, making such comparisons ran the risk of losing the uniqueness of the individual teaching academic. Reconciling the particular with the general while generating an understanding of the processes at work, was an ongoing challenge. This is dealt within Chapters Seven and Eight which report on the findings.
Commenting on studies on innovation in large organisations, Rogers (2003) stated that gathering information from a few individuals at the top of a large organisation would not provide valid or unbiased information related to the questions explored in the study. Credibility and trustworthiness are established in this study by gathering data from members in all the faculties working in lecturer levels A-D who carry out the teaching, and conceptualise and implement the innovation themselves. Based on suggestions by Lincoln and Guba (1985), research strategies used to ensure credibility and reduce bias include the following:

**Maintaining a field journal** – Every interview was accompanied by a field notes and observations document which included demographic data, such as date and time, place of interview, number of years as a teaching academic and the number of years of experience of web-based teaching, unit codes and titles and also URLs to access websites. Observations and reflections included in these field notes related to each individual’s web-based teaching and learning approach and other supporting study materials (See Appendix 4 for an example of field notes).

**Maintaining rigorous data-gathering** – Interviews were tape recorded, then transcribed and checked for accuracy against the tape. Transcripts approved by participants were then organised together with related field notes and artefacts.

**Triangulation** – This was accomplished through different data sources. While interviews were the main source, what participants said in the interview was verified by examining the related website and artefacts and compared with field notes and observations which formed a useful third data source. The multiple sources of data contributed to building validity.

**Internal validity** – Extensive pattern-matching and explanation-building were carried out during the data analysis stage.

**External validity** – External validity was established by using replication logic in the multiple cases. This was built into the research design and was an important part of the analysis process.
Reliability – All participants were asked the same set of questions in the same order and the interview protocol was adhered to in the data gathering process to ensure reliability.

Participant checking – All participants were requested to check the transcript for accuracy and approve it. This gave them the opportunity to rephrase or revise their comments.

Use of software – The use of software packages to analyse data increases reliability because other researchers are able to follow and construct the same procedure (Richards & Richards, 1994). The use of NVivo® provided a transparent analytical approach that can be followed or rebuilt by another researcher, thereby increasing the trustworthiness of this study.

Use of supportive quotations – Verbatim quotations used in the findings of this study increased its trustworthiness and the credibility of the results.

The above measures were undertaken, as applicable, for the duration of the study.

Data analysis

The choice of research questions, the sample, and the data collection methods all contributed to data reduction which was an essential aspect of analysis. First, all interviews were transcribed and field notes were typed. In order to obtain a general sense of the data, including what participants were saying, the tone of ideas, general impressions and a holistic view of information, marginal notes were made. These were the first general thoughts about the data. Summary sheets of each case were drafted before coding, categorising and the data reduction process.

The start of the data analysis relating to each teaching academic was descriptive. Interpretation of what was going on, and how, guided the descriptions and the building of the story. These descriptions were followed up by the analytical why question which resulted in explanations that were condition and context dependent, partial and inconclusive (Huberman & Miles, 1994).
Data analysis was an ongoing reflective process to make sense of the data. It included interrogating the data and writing memos throughout each interview to contribute to the analysis. A detailed description of the setting of the participant was followed by an analysis of the data for themes and categories as recommended by both Stake (1995) and Creswell (2003).

The coding process was the next stage. The material was organised into chunks and data were coded using NVivo®. This use of the software allowed searching through the data, structuring it into categories and labelling them. These categories were organised under a tree or branching structure (see Appendix 5 for all codes). The final codes that were generated are presented in Table 5.3, mapped against the interview questions and question categories of Patton (1990). This assisted in structurally and hierarchically organising the data to identify its importance and relevance.

Codes were first defined with specific attributes so that the descriptions remained consistent. The unit of analysis of each code was an idea which was in most cases a response to a question. A large number of codes was first generated. Codes were used to group and sort data according to interpretation and theoretical analysis. They were also used to search for recurrences and patterns in the data either through their presence or absence.

Creswell (2003) noted that there is no single way of analysing data and that analysis is an eclectic process which attempts to make sense of data. In the open coding process, data were broken down into parts, examined, questioned, and compared for similarities and differences (Strauss & Corbin, 1990). As noted by several qualitative research methods authors, each researcher approaches this differently. Patton (1990, p. 297) stated that qualitative data are ‘voluminous’ and, the process of making sense of data ‘overwhelming’, and he listed five kinds of questions that can be used to draw different types of information from respondents. (Table 5.3 illustrates how Patton’s question categories guided the interview questions and led to obtaining the codes.)

The next step was to move beyond the more generic approach to the more specific and position the data within the theoretical model and analyse the codes from that
Chapter Five – Research Procedure

perspective. This led to a staged iterative analysis recommended by Anfara, Brown and Mangione (2002). In the first iteration of the initial coding, the data were analysed for surface content and organised into manageable segments or chunks.

In the second iteration, similar topics were clustered together and labelled and categorised again. As suggested by Bogdan and Biklen (2003), this iteration of recoding and refining reduced the data into themes and re-contextualised the data into key ideas. Codes were organised into descriptive themes along the lines suggested by Creswell (2003), paying particular attention to those relating to setting and context; perspectives held by subjects; subjects’ ways of thinking about people and objects; process codes; activity codes; strategy codes; relationship and social structure codes; and pre-assigned coding schemes.

Issues that related to each participant were identified. Responses of individual participants were analysed and subjected to interpretation in order to develop a complete descriptive portrait and a detailed view at the microcosm level. Analysis of these responses across individual teaching academics resulted in exploring relationships and similarities, looking for patterns and correspondence between them (Creswell, 1998). Next, comparative analysis was carried out between participants. The comparison was first between teaching academics within the same faculty and thereafter, amongst all participants. The underlying similarities and associations were first sought and from there an explanatory model was developed. Cross comparison led to finding families or clusters that shared certain characteristics or patterns (Huberman & Miles, 1994). Themes were analysed in relation to each participant and across participants to establish connections and similarities.

The third iteration reduced the data further and focussed on the key ideas and themes relating to the research question (Anfara et al., 2002). Finally, the above descriptive codes were analysed according to the theoretical framework of this study. This helped to develop a detailed account of information about the adoption of web-based learning and teaching approaches of teaching academics, including surrounding events and the context that provided influencing and contributing factors which built the descriptors for this case study.
Table 5.3 (on the next page) demonstrates how Patton’s questions and categories guided the construction of interview questions, and how the codes were reduced and derived as described by Anfara et al and related to the interview questions.
<table>
<thead>
<tr>
<th>Patton’s (1990) question category</th>
<th>Interview question themes</th>
<th>Corresponding codes</th>
</tr>
</thead>
</table>
| **Experience / behaviour questions** | Describe how teaching academics have adopted web-based learning and teaching approaches (methods, processes adopted), how they have changed their teaching, the impact on their work | • Experimenting  
• Reaching out for help  
• Training  
• Faculty standing/leadership |
| (Description of behaviours, actions and activities) | | |
| **Opinion / value questions** | Opinion on teaching online and comparison with teaching academics’ previous face-to-face teaching.  
How they thought they had changed. Reasons for making the change. | • Reasons for adoption  
• Acknowledgement and rewards  
• New work practices  
• New learning |
| (People’s thoughts and values) | | |
| **Feeling questions** | How teaching academics felt about teaching online and how they thought their work in general had changed, their frustrations and successes. | • Technology barriers  
• Workload  
• Time  
• Research  
• Developing learning resources  
• Email, e-moderating  
• Working in teams  
• Network exposure  
• Attitudes  
• Support (funding, technology etc.) |
| (Emotional responses) | | |
| **Knowledge questions** | What activities were engaged in and the tools used in their functioning of what they believed was teaching online. | • Teaching approach  
• Organisational support - Resources – funding  
- Structures – policies  
- Strategies – training  
• Policy  
• Political climate |
| (What is considered as factual information regarding the research topic) | | |
| **Background / demographic questions** | Little background information was sought.  
The demographic information requested  
• the number of years of teaching experience in higher education, and  
• the number of years of teaching experience online. | • Faculty affiliation |
| (Relation to other people, age, education, race, etc.) | | |
The data, once organised around the complete list of codes, as in Table 5.3, were once again analysed against the diffusion of innovation theory and actor-network theory described previously in this chapter. The codes were mapped against the shaded areas of Table 5.1 – the descriptors derived through the Integrated Theory of Diffusion of Innovation. One code (reasons for adoption), belonged here. However, two other codes (individual teaching approach and rewards and satisfaction), were consistent with individual adopter profiles and were used to describe individual teaching academics using the Integrated Theory of Diffusion of Innovation (see Chapter Seven).

All other codes fell into the non-shaded area of Table 5.1. This included rewards, considered as belonging to the organisational context and treated as an actor that influenced and contributed to the teaching academics’ adoption of web-based learning and teaching approaches (see Chapter Eight). These influencing and contributing actors were interpreted using an actor network theory.

Consequently, the findings of this investigation are presented in two chapters. The individual factors related to adoption of web-based learning and teaching approaches are described in Chapter Seven using the extended diffusion of innovation theory, while Chapter Eight uses actor-network theory to interpret the organisational and contextual factors relating to adoption of web-based learning and teaching approaches. Table 5.4 shows how the coding was organised under individual factors (using the Integrated Diffusion of Innovation Theory – Chapter Seven) and organisational factors (described using actor-network theory – Chapter Eight).
### Table 5.4  Organisation of codes derived from the Integrated Theory of Diffusion of Innovation and actor-network theory

<table>
<thead>
<tr>
<th>T E A C H I N G</th>
<th>Individual factors</th>
<th>Organisational factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Individual teaching academic</td>
<td>Influencing and contributing actor-networks</td>
</tr>
<tr>
<td></td>
<td>Reasons for adoption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Perceived attributes/technology considerations</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>- Relative advantage</td>
<td>Workload</td>
</tr>
<tr>
<td></td>
<td>- Compatibility</td>
<td>Developing learning resources</td>
</tr>
<tr>
<td></td>
<td>- Complexity</td>
<td>Discipline based research</td>
</tr>
<tr>
<td></td>
<td>- Trialability</td>
<td>Web-based communication</td>
</tr>
<tr>
<td></td>
<td>- Observability</td>
<td>New work patterns</td>
</tr>
<tr>
<td></td>
<td>Educational need</td>
<td>Unknown factors</td>
</tr>
<tr>
<td></td>
<td>- Desire to improve things</td>
<td>New learning</td>
</tr>
<tr>
<td></td>
<td>- User demand and expectations</td>
<td>Working with teams</td>
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<tr>
<td></td>
<td>- Participation and status within faculty</td>
<td>Network exposure</td>
</tr>
<tr>
<td></td>
<td>- Satisfaction/rewards</td>
<td>Acknowledgement and reward schemes</td>
</tr>
<tr>
<td></td>
<td>- Teaching approach</td>
<td>Policy on IP</td>
</tr>
<tr>
<td></td>
<td>- The unit</td>
<td>Technology barriers</td>
</tr>
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<td></td>
<td>- The website</td>
<td>Political climate</td>
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<td></td>
<td>- Student centredness</td>
<td>Attitudes</td>
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<tr>
<td></td>
<td>- Communication approaches</td>
<td>Unstable technology</td>
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<tr>
<td></td>
<td>- Student cohorts</td>
<td>IT skills and support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Funding</td>
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<td>Policy</td>
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<td>- gaps in policy</td>
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<td></td>
<td></td>
<td>- policy related to web presence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- policy and teacher support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Training and professional development</td>
</tr>
</tbody>
</table>

### The researcher’s position

The researcher’s position was that of an ‘almost’ outside observer introduced to the participants through a primary informant who was a key person or a leader in the
faculty. The position is regarded as ‘almost’ that of an outsider because, as a member of
the university staff, the researcher could not be classified as an outsider and at times had
come into contact with some participants in the line of regular work. While this may cast
doubt in terms of objectivity (not a plausible concept in actor-network theory
(Underwood, 1998)), it gave the researcher important background information.

**Summary**

This chapter has explained how the two theories – the Integrated Theory of Diffusion of
Innovation and actor-network theory support the research procedure. The chapter also
further explained the rationale behind selecting the case study method and explained the
research design and the supporting data collection procedure. How the data were
managed, coded, categorised, and analysed was also described. The chapter concluded
by explaining how the theoretical framework discussed in Chapter Four will be applied
in understanding the findings reported in Chapters Seven and Eight: actor-network
theory will be used to describe the contextual non-human aspects that contribute to and
influence the process, and the Integrated Theory of Diffusion Innovation will be used to
describe the reasons teaching academics act in a particular way and develop individual
teaching approaches.
Chapter Six  

Context of the study

Overview

This chapter provides a description of the context within which teaching academics in this study adopted web-based learning and teaching approaches. While a description of the context is necessary to understand the background where innovation adoption takes place, it is also relevant in case study methodology to establish the case. It is presented here to serve both needs.

The context is significant in order to understand the implementation of web-based learning and teaching approaches as each context has its own cultural values, and therefore the change process is usually adapted to the norms and values of that environment (Ely, 1990, 1999). This chapter explains those norms and conditions.

More recently Kayrooz and Trevitt (2005, p. 3) have highlighted the ‘pervasive effect of context’ when researching organisations, including its centrality and ‘its crucial political, economic, social and cultural dimensions’. These observations are pertinent to the current study as the findings in Chapter Eight demonstrate. Since the context of this study is Monash University, the current chapter provides an account of the institution as relevant to this dissertation. These include an overview of the University, its policies on technology for teaching and learning and demographic details of participants.

The University

Monash University (http://www.monash.edu.au) has nearly 2500 teaching staff and more than 53,000 students from over 100 countries (Monash University, 2004a) taking courses from ten faculties across eight campuses. Six of these campuses are based in Victoria, Australia and two overseas in South Africa and Malaysia. In addition, the University has two centres in London, UK and Prato, Italy and operates through private providers in Singapore and Hong Kong. Monash University considers itself to be
Australia’s largest university with a global focus and a strong history of both on-campus and off-campus education.

The ten faculties offer a broad range of degrees in a diverse range of disciplines via both conventional face-to-face classroom teaching and off-campus flexible modes of delivery. In more recent years, there has been a blurring of the on- and off-campus learning opportunities with the adoption of more flexible web-based approaches.

The University’s vision in Monash directions 2025 (Monash University, 2005a) and strategic framework in Excellence and diversity 2004-2008 (Monash University, 2004b) set the institutional directions and priorities, the main defining themes being excellence in research and scholarship, excellence in education, excellence in management, an international focus, innovation and creativity, diversity, fairness, engagement, integrity and self-reliance. Additional detail is provided by other supporting and enabling plans.

Like any organisation, Monash University has its own unique culture, politics, values, goals and its own perspective on innovation, change and technology adoption. Whitworth (2005, p. 685) aptly pointed out that integrating e-learning in the cultural and technological environment of the modern university ‘must be recognised as a process with political implications’ where tensions are high, time for evaluation and reflection is limited and financial investment in technology is huge. By setting up structures such as staff development programs, helpdesks, and a long term planning vision (Bell & Bell, 2005), Monash University has addressed potential areas of political conflict and stress. Whitworth (2005) emphasised the uniqueness of each organisation which has its own unique political features which can significantly influence innovation adoption, promotion or failure. Aspects of Monash University are described in the next section.

**The University policy on technology for learning and teaching**

Information technology adoption and use are integrated in the University’s strategic plan. The University has made significant investments at institutional level in technology infrastructure, staff and student support services and institutional development. Supporting teaching academics’ adoption and use of technology to
facilitate web-based approaches in learning and teaching is part of this strategic initiative.

It has invested heavily in network infrastructure as a means of serving a growing student population world-wide, providing universal access by giving all students network and email accounts. Classrooms have been upgraded, networked and modernised. A central server hosts all the online units and supports all web-based accounts while some faculties also host their own servers.

The information technology strategic plan sets out the framework for the application and use of information technology within Monash University and spells out the strategy and vision for an e-Monash (Monash University, 2005b). While it ensures that the overall University-wide IT initiatives are aligned with the University’s mission, its responsibility also includes the application of IT to the core business of the University which is successful learning and teaching and research. The plan defines strategies for an e-Monash that responds to educational opportunities and developments in technology. At a faculty level, the policy acknowledges that assisting teaching academics to produce high quality, effective and flexible web-based educational programs is a priority.

The policy points to: a need for ‘a consistent and coordinated approach . . . to share experiences and knowledge, focus on a common set of products and tools, and provide structured staff development and support’; the ‘development of university-wide standards and policies for IT usage in support of learning and teaching’; and ‘defining a set of standards, protocols and guidelines to support the development of high quality and effective learning and teaching approaches, and associated courseware, and its ease of use’ (Monash University, 2001, 2005b). While these aims recognise the need to focus attention in specific areas, they also indicate that these sections of policy are still evolving. The policy also acknowledges that new technological applications supporting learning and teaching require appropriate and complementary training and professional development opportunities.
University-wide adoption of web-based technologies

A specific initiative of the University’s technology policy is the University-wide introduction of a web-based learning system. WebCT (Web Course Tools) Vista® is an internet-based teaching and communications tool selected by Monash University as its Learning Management System (LMS) and deployed as a vehicle for flexible web-based learning and teaching. The University’s Information Technology Services (ITS) first implemented the LMS service (using WebCT Campus Edition®) in Semester 1, 2002. Prior to this, the Faculty of Business and Economics hosted this LMS in their faculty to offer their courses. Subsequently, it was adopted across the University over 2003-2004. In Semester 1, 2004 the University commenced a pilot project with the enterprise version WebCT Vista® and University wide delivery commenced in 2005.

At the time of conducting this study, several web-based learning systems were being used by teaching academics across the University – WebCT Campus Edition®, WebCT Vista®, the my.Monash.Portal and InterLearn. The my.Monash.Portal (Portal) is a personal gateway into the relevant online academic, administrative and support resources for every Monash University student and staff. InterLearn, is a web-based collaborative online learning environment developed at Monash University (Webster & Murphy, 2001).

Facilitating adoption application

The key institutional level strategies that facilitate implementation of adopting web-based learning systems are as follows:

- the appointment of Associate Deans, Teaching (ADTs) in every faculty with their role focusing on teaching in that faculty which also includes the implementation of the technology policy as it relates to teaching and learning and the provision of policy level direction within the faculty;

- centrally offered LMS training workshops (a course consisting of eight short workshops) offered repeatedly on all campuses to support staff with training needs, along with other similar centrally provided training initiatives;
• Vice Chancellor’s Teaching Awards for innovations in teaching to promote, encourage and reward effort in teaching which includes teaching with technology;

• a centrally offered Graduate Certificate in Higher Education for all teaching academics to promote good teaching, including a pedagogical understanding of technology use for teaching;

• mentoring schemes offered through the central Centre for Learning and Teaching Support (CeLTS) via a secondment scheme; and

• educational design support offered through the Centre for Learning and Teaching Support (CeLTS) (a central service of the University).

Adoption of web-based learning and teaching approaches is haphazard across the University. While the University centrally offers IT support to all faculties, some faculties have their own IT support systems. All faculties have resource allocation autonomy and supporting policies that influence and contribute to adoption patterns of web-based learning and teaching approaches of teaching academics in those faculties.

Power is more decentralised in a university, unlike in a corporation or business institution where power is likely to be located at the top of the organisation (Kayrooz & Trevitt, 2005). Individual faculties have a high degree of autonomy and teaching academics have a degree of freedom about how and what they teach and how they organise their learning materials. Yet, in the context in which the current study takes place, some of these freedoms are challenged by top-down directives (explained in Chapter Seven), making the context unique.

**The respondents**

The participant group consisted of twenty-two Monash University employees who had been involved in teaching in higher education ranging from two to forty-six years, at the time data were collected. They had all taught online and used web-based tools from two
to ten years, acquiring for themselves varying backgrounds of experience from which
they were able to contribute to this study.

All except one of the twenty-two participants at the time of conducting this study held
academic roles such as research fellow, associate professor, senior lecturer, lecturer,
assistant lecturer and sessional lecturer. The one exception had moved from an academic
position to assume the faculty web manager role (though was teaching online until the
previous semester). These twenty-two participants represented the ten faculties in the
University.

Though commenting on the wider context, observations by Lankshear and Snyder (2000,
p. 1) reflect the reality of the professional lives of the participants in this study: ‘In a
world increasingly mediated by communication technology, teachers are faced with far
reaching demands to integrate new technologies into teaching and learning’.

In this study, all except four participants used WebCT Campus Edition® or WebCT
Vista®, while two used InterLearn and one used the Portal. Of the other two
participants, one had no website while the other was the web manager for the faculty.

Naturally, their comments, reflections and experiences were in relation to the particular
web-based learning system each of them used. They also referred back to and made
comparisons with previous systems they used which have either become obsolete, been
replaced by new versions or are not now used because participants have made changes
and adopted the University’s learning management system.

This study presents a snapshot of the online teaching lives of the twenty-two teaching
academics. The participants revealed adoption patterns, issues, concerns and ideas that,
in some instances, occurred across and overlapped with other participants. The portraits
were uneven in development (explained in Chapter Seven) and the differences in faculty
infrastructure, availability of resources, and technology support (explained in Chapter
Eight) must therefore be considered. The teaching academics displayed doubts,
suspicions and fears related to insecurity and exposure to unfamiliar learning and
teaching approaches. They also revealed professional isolation and the absence of
collegial support for the innovator who works at the cutting edge. They all dealt with
tensions surrounding the development and use of new approaches and grappled with time, new literacies required to execute new tasks, and competing values and priorities, such as balancing research and development of strategies for embedding web-based learning and teaching into their practice.

Common to all of them was commitment, energy, enthusiasm, hard work and their perseverance in looking for ways to make things work. This adoption energy was identified as a four stage process by Hartman and Truman-Davis (2001) involving access-awareness-mastery-application as staff adopt web-based learning and teaching approaches successfully.

**Summary**

The context was described in this chapter because research should be understood as ‘the exploration of experience within its social context’ (Kayrooz & Trevitt, 2005, p. 9), and as a consequence the nature, structure and the culture of the cohort that is the focus of the study needs to be acknowledged.

This brief chapter described the context in which the participants conducted their professional activities and which provided the institutional policies and the contextual conditions that guided and regulated that adoption. The next two chapters will present the results of this study using the information in this chapter as a background. Context is particularly relevant in Chapter Eight which deals with contextual aspects as the participants in this study experienced them.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

Overview

This chapter presents the findings in keeping with the approach described in Chapter Five, using the Integrated Diffusion of Innovations Theory and focussing on the participants and their faculties to contribute to a better understanding of the case, which is the institution.

A worthwhile and competent study of adoption of educational technologies does not present views from only individual personal perspectives and should explore technical, social and political aspects. These aspects of the findings are presented in Chapter Eight.

As described in Chapter Four, an innovation is an idea, a practice or an object that is new to an individual. While using technology for teaching and learning is not new, for this group of teaching academics, adopting web-based learning and teaching approaches and using the University’s learning management system (LMS) is an innovation.

As explained in Chapter Two, this study is driven by the following research questions:

1. What influenced the decisions to adopt web-based learning and teaching approaches?

2. How did the context influence the decisions to adopt?

3. What web-based teaching approaches do teaching academics use?

4. What conditions stabilised the adoption of web-based learning and teaching?

5. What can be learned about strategies necessary to implement web-based learning and teaching?
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

The findings reported in this chapter answer Questions 1 and 3 but also help inform the answers to the other three research questions.

**Describing the findings through the Integrated Theory of Diffusion of Innovation**

Concepts from the theory of diffusion of innovation relevant to understanding the findings in this study were described in Chapter Four. Also described in the same chapter was the Integrated Theory of Diffusion of Innovation which used Rogers’ theory as well as contributions from others (Ely, 1990, 1999; Farquhar & Surry, 1994; Stockdill & Morehouse, 1992) (see Figure 4.1 and Table 4.1). The findings reported in this chapter are analysed against this Integrated Theory of Diffusion of Innovation.

The study examines the innovation process within an organisation and therefore the unit of analysis is the institution rather than the individual (as it may seem in this chapter).

The data are obtained from all faculties and indicate different stages of adoption.

Innovation studies in organisations often draw their data from their top executives and there is no way to verify whether their responses truly represent the entire organisation’s response with regard to innovation. Therefore, the data in this study were collected from members in all the faculties employed in lecturer levels A-D (assistant lecturer to associate professor) who represent the institution and carry out the innovations themselves.

Table 7.1 is based on the analytical framework described in Table 5.4 (in Chapter Five) which presented the descriptors for the participants. The shaded area in Table 7.1 relates to the individual factors affecting individual participants. The twenty-two participants are analysed according to three main codes in this shaded area – reasons for adoption, satisfaction and rewards, and individual teaching approach.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

Table 7.1 The focus of Chapter Seven (shaded area) in relation to the theoretical framework of the study

<table>
<thead>
<tr>
<th>Individual teaching academic</th>
<th>Individual factors</th>
<th>Organisational factors</th>
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</thead>
<tbody>
<tr>
<td>Individual factors</td>
<td>Reasons for adoption</td>
<td>- Time</td>
</tr>
<tr>
<td>- Perceived attributes/technology considerations</td>
<td>- Workload</td>
<td></td>
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<tr>
<td>*Relative advantage</td>
<td>- Developing learning resources</td>
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<td>*Compatibility</td>
<td>- Discipline based research</td>
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<td>*Complexity</td>
<td>- Web-based communication</td>
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<td>- New work patterns</td>
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<td>*Observability</td>
<td>- Unknown factors</td>
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<tr>
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<td>- Participation and status within faculty</td>
<td>- Acknowledgement and reward schemes</td>
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<td>- Satisfaction/rewards</td>
<td>- Policy on IP</td>
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<td>- Teaching approach</td>
<td>- Technology barriers</td>
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<td>- The unit</td>
<td>- Political climate</td>
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<td>- The website</td>
<td>- Attitudes</td>
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<td>- Student centredness</td>
<td>- Unstable technology</td>
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<td>- Communication approaches</td>
<td>- IT skills and support</td>
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<td>- Student cohorts</td>
<td>- Funding</td>
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<td>- Policy</td>
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<td>- policy related to web presence</td>
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<td></td>
<td>- policy and teacher support</td>
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<td></td>
<td>- Training and professional development</td>
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</table>

The teaching approach of each individual teaching academic is described according to how each of them incorporated e-learning opportunities with their teaching. Full adoption of e-learning has been described as a continuum: an ‘enhanced approach’ that moves on to a ‘blended approach’ and finally evolving into an ‘online approach’
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

(Garrison & Kanuka, 2004, p. 97). Garrison and Kanuka (2004) explained that blended approaches effectively integrated face-to-face and internet technologies and facilitated a community of inquiry through a strong teacher presence. In contrast, web enhanced approaches provided a range of resources online which were not integrated with the face-to-face teaching. In describing individual teaching approaches, the descriptors ‘enhanced’ and ‘blended’ are used. In addition, those static websites that were ‘add-ons’ to satisfy the requirement for a web-presence, are described as ‘add-on’.

To maintain the authenticity of the case study approach, the descriptions and perspectives of the teaching academics are maintained through their ‘voices’ or statements. They are also presented within their faculty groupings which give the multi faceted variety to the case. The institutional context which is the ‘bounded community’ or the given social system which influences the adoption is described in Chapter Eight.

Demographic data

As explained previously, the twenty-two participants in this study came from the six Victorian campuses of Monash University, represented all its ten faculties and taught in a range of disciplines. Of the thirteen female and nine male participants, one was an associate professor, two were research fellows, five were senior lecturers, nine were lecturers, one was an assistant lecturer, two were sessional lecturers, one a course manager and one was a web manager. Of this group, two participants used InterLearn, one used the University Portal and one used their faculty server. The other eighteen adopted WebCT Campus Edition® which was the University’s central learning management system (LMS), prior to the University upgrading to WebCT Visita®. The units were taught at both undergraduate and post-graduate levels and participants’ class sizes varied considerably.

Participants had been teaching in the tertiary sector from two to forty-six years and had conducted much of their teaching using the traditional on-campus model of lectures and tutorials. While they were all using web-based approaches in their teaching, none of them had a wholly online unit. They were all using web-based platforms to complement and support their traditional on-campus or off-campus teaching via a ‘web-enhanced’
(Belanger & Jordan, 2000, p. 52) or ‘blended learning’ (Morrison, 2003, p. 376) model, while some had static websites that were ‘add-ons’ to meet the need for a basic web presence.

Five participants taught only off-campus learners. Their main learning materials were specially prepared learning guides in the traditional distance education mould and they used their websites as a support only. Eleven participants taught only on-campus learners and their websites supplemented and supported their classroom lectures and tutorials.

Six participants taught their units to a student cohort based on-campus and off-campus and used their website as a common space for on-campus and off-campus learners. While some had websites with resources that were integrated, many had basic sites which were simply add-ons and enhancements to their dominant teaching approach. What was also significant was that none of the study participants used the site for any work that was assessed or directly counted towards students’ final assessment.

In Table 7.2 the individual participants are presented within each of their faculties with a summary of their demographic details. (Pseudonyms are used to protect identity.)

Table 7.2   Demographics of participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Sex</th>
<th>Position</th>
<th>Subject</th>
<th>Level taught</th>
<th>Technology used</th>
<th>Student group</th>
<th>*Years as university teacher</th>
<th>**Years teaching online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty of Arts</td>
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<td></td>
</tr>
<tr>
<td>Betty</td>
<td>F</td>
<td>Senior lecturer</td>
<td>Media communications</td>
<td>U/G</td>
<td>WebCT</td>
<td>On-campus</td>
<td>18</td>
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## Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

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U/G – Undergraduate      P/G – Postgraduate

* Years as university teacher – at the time of the interviews

** Years teaching online – at the time of the interviews
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

Participants

The individual accounts provided by participants and recorded in this section are uneven and demonstrate varying degrees of detail. Some accounts are longer than others because these participants had more experiences of web-based learning and teaching and therefore were better placed to share their experiences. The shorter accounts are no less important to this study as they demonstrate the efforts and experiences of the early mainstream adopters among teaching academics. These accounts show that there is no one template for adopting web-based learning and teaching although there may be common elements in the websites and the approaches used. Each participant used the technology differently, and indicated varying influences on and motivations for its adoption. While the term ‘homophily’ is used to describe the degree to which individuals within the bounded community share similar interests, Rogers (2003) commented that innovation is taken up more rapidly if it can be reinvented to suit individual needs. In the hands of these participants, the innovation was reinvented in many different ways as the individual accounts show.

The unevenness of adoption demonstrated in these accounts is a microcosm of the adoption behaviour across the University. These participants demonstrate the nature of change, that innovation does not happen simultaneously in every part of the University at the same pace, and that innovation emerges from within a small group (Whitworth, 2005).

What influenced their decisions for adopting web-based learning and teaching and what specific approaches they adopted are described on the following pages using the terminology (italicised) of the Integrated Theory of Diffusion of Innovation. As shown in the shaded area of Table 7.1, the three individual factors – reasons for adoption, rewards and teaching approach are used as the main descriptors of participants.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

Faculty of Arts

Betty

Currently a senior lecturer, Betty has been teaching at tertiary level for eighteen years. Her unit in Media Communications is taught to a large undergraduate student group of 230 students that includes both on-campus and off-campus students.

Adoption – Her interest in the potential of web-based technologies developed through observing colleagues. The technology considerations and advantages demonstrated to her by her colleagues influenced her reasons for adopting the University’s LMS. She valued the ongoing interaction with her students that web-based teaching made possible.

I wanted to make learning experiences much richer. There was no satisfaction for me in just preparing the print materials no matter how good they are in sending those out to my students and then never hearing from them except if they’re in crisis . . . and there are things that you really just can't do with the print materials, they are necessarily static.
You take a lot of the dynamism of learning away as soon as it's just you and your books.
– Betty

She was driven by an educational need to support her learners as well as to make the learning experience richer and more dynamic for them. Adopting the University’s LMS offered her a clear advantage over her previous strategies.

Teaching approach – Her web-based teaching consisted of a site on the University’s LMS server that provided materials in multimedia format and included email communication, a discussion forum, resource links to relevant websites, PowerPoint slides of her weekly lectures as well as administrative resources such as the unit guide and an online calendar. These supported her teaching approach with the on-campus group whom she also taught through weekly lectures and tutorials. Her off-campus online teaching was supported by print materials and study guides. The objective of introducing the discussion forum was to make early contact with the students, to motivate and build confidence and open up communication channels to encourage them to ask learning-related questions they may have later. However, of the 230 students, only 15 used the WebCT® discussion forum and Betty emailed lecture notes every week to a majority of her students. The print materials provided to the off-campus learners were
comprehensive and there was no compelling need or requirement for them to log on to the site. Similarly, there was no compelling reason or requirement for the on-campus learners (who had two weekly lectures and a tutorial) to log on to the site.

**Rewards** – She gained satisfaction in observing the adoption of web-based technology, and pride in the visible results of her students’ response to her own adoption.

> I love the online…… you're learning to create new forms of learning environments that add to what has been done. I find that hugely satisfying. I love the fact that I can see that students get satisfaction and intrinsic rewards out of completing certain learning activities in ways that I don't think they find so rewarding if it's just jotting some words down on a page. You know if they are manipulating things in the online environment, and reflecting on their learning, they're enjoying it more too and so you get a nice cycle I guess of positive experience in that, I think it's added a lot, for me it's added a lot. . . . I would feel hugely diminished if it were taken away. – Betty

Betty’s site was an add-on which most students did not use. The site therefore, lacked a sense of community and belonging. There was no effective integration of her face-to-face classroom sessions with the web-based resources she provided, which were largely additions to her existing dominant teaching approach.

**Thomas**

Thomas had been a lecturer at a regional campus for twelve years and his Indonesian Language unit had included a website for at least eight years, though he had only used the University’s LMS for the last two years. His current unit was a final year undergraduate unit for both on-campus and off-campus students.

**Adoption** – The key contributing factor for Thomas was a 1996 grant which assisted in the setting up of an open access website.

> You can’t be a translator unless you use the web. You just have to deal with that because people are moving. . . . people monitoring the news, giving news briefs and so on, summaries in English for Indonesian articles, that’s all done through the web and as a translator or a language consultant, you wouldn’t be able to work unless they jump into it very very early. – Thomas

The technology *advantages* for Thomas were the possibility to introduce cultural aspects of Indonesian through the use of language teaching audios, videos and pictures, the possibility to be consistent and offer online resources in all units of the course, the
ability for students’ to maintain their own web pages, and the ability to build learner profiles.

Adopting the University’s LMS was a top-down authority innovation directive for Thomas whose school faced political and economic problems. The move was undertaken to improve dwindling student numbers, to avert the threat of being shut down, to be market savvy and to capture a student body that would travel internationally and locally, and still be able to use audio, video and the internet. However, the LMS with its password protected entry, was considered too restrictive in comparison to his previously hosted open-access websites which were visited by professionals and native language speakers from outside the University.

The educational need directed that, to be professional online translators, it was necessary that students used the web and email, and participated in tasks they would be involved in as professionals. Students, in turn, drove demand, calling for a website that was more functional for them.

For Thomas,

[The] interest in the internet is because there was a degree of anonymity about it. . . . A certain freedom that they could be somebody else because people weren’t seen. – Thomas

The technology advantage of anonymity was useful when learning and experimenting with a new language and helped students. Email and chat also made it easier to engage with language outside a face-to-face environment.

Teaching approach – Thomas’ unit had extensive print resources which both on-campus and off-campus students received. The unit site on the LMS included basic features such as a unit outline, a calendar, email and hyperlinks. Its use was compulsory for all students because Thomas used discussion forums around specific assignments, chat to assist with translations and each student had a nominated assignment that had to be shared by publishing it on the website. Every student also had their own webpage on the site in order that they could begin to develop a public presence and a profile as a translator. These resources were extensively complemented by CD ROMs with
collections of resources such as media interviews and newspaper clippings, as well as commercially available DVDs. In addition, outside the LMS, using a free public site, he hosted a chat session for students so that outsiders were able to join in, and students were able to interact with native speakers of the language and the world outside the University where they would be working. While the use of these web-based resources was mandatory, it was also complemented by a weekly classroom lecture.

The web-based learning approach adopted by Thomas was a blended learning approach. His site had a strong teacher presence and a sense of community among students. The resources were well integrated requiring online participation and attendance at face-to-face class sessions.

**Rewards** – Thomas based his Masters research on these developments and had already published one article on this work.

The Faculty of Arts offered a few training workshops on specific software packages and faculty technical support was thinly spread. Both Betty and Thomas from this faculty accessed staff development and technical support from the University’s central services and not from their faculty.

**Faculty of Art and Design**

**Don**

Don, who had taught in the tertiary sector for the previous seven years at the time the current study was conducted, was the manager of a post-graduate course on Multimedia Design consisting of four units. All units managed by him were taught on-campus only, and used the traditional approach of two lectures and a tutorial per week.

**Adoption** – He believed that using technology for teaching was *compatible* with the values and expectations of a multimedia design course.

Ours is a Master of Multimedia, and it would be an expectation that we should have something reasonably sleek in terms of online exchange of information or learning. – Don
The faculty has its own server ‘Happy Jack’ and most teaching academics use it for its simplicity and convenience while others have experimented at hosting their own website. Don recognised the key advantages of the LMS to be its capability to provide structured information as well as organisational and quality assurance possibilities, meeting general University expectations of having an online presence, and serving student demand. Yet, at the time data were collected for this study, the teaching staff of these four units had not yet made any move to adopt the University’s LMS. Their reasons were that the LMS was complex, difficult to understand, hard to use and above all, needed time to learn before use. There was no pressure to adopt the system because there was no faculty-wide accepted system nor a policy related to adopting and using the University’s LMS, leaving individual teaching academics free to use whatever technology they wished.

No one has actually yet embraced the concept of one global system that will suit this sort of faculty. – Don

Teaching approach – The resources of the four units Don managed were on the ‘Happy Jack’ server which had a simple interface with information organised in easily accessible folders and presented in a user-friendly style similar to the style of ‘Windows Explorer’. Each unit had its dedicated folder which contained a unit outline and weekly lecture slides. While only one lecturer provided lecture slides in PowerPoint, the other three (true to their multimedia backgrounds) provided the same in animated MacroMedia Flash. The folders were repositories of information only and provided a method for delivering slides of a lecture which a student may have missed. The main teaching of all four units was carried out in class while one unit had its own chat site hosted on a free public site. It had been set up by a student and had modest participation from the other students.

The adoption approaches described by Don were an add-on. The online presence existed to facilitate easy access to lecture notes and was therefore a means to deliver resources only. There was no teacher presence, no supporting discourse, nor a community of learners online.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

The data indicated that this faculty so far had no global technology adoption policy. There was also no specific technology training offered within the faculty, though individual teaching academics used the technology as they wished.

Faculty of Business and Economics

Jenny

Jenny was a lecturer in Business Law with fourteen years of tertiary teaching experience. She had developed a website for her unit that was used for over six years which she had two years previously moved to the University’s LMS.

Hers was a large first year undergraduate group of nearly 300 students studying on-campus as well as off-campus. She provided a traditional lecture and tutorial for her on-campus group while specially prepared print materials were issued to all students. The site on the LMS strongly complemented the lecture and print materials.

Adoption – Jenny adopted the LMS for a range of reasons but mostly for its compatibility and consistency with student needs and expectations.

Today’s students are of a computer generation and they come in with some expectation. They’ve been doing PowerPoint presentations in high school, they are also the TV, video, DVD generation. . . . But just with their expectations and their experiences in mind, and with what the workforce expects from them when they graduate, they need to go out and use the technology the way we should be role-modelling for them in the university, so I jumped in on WebCT. – Jenny

The main contributing factor was the grant funding Jenny received which helped draw on other University resources such as educational design support and multimedia development skills.

Teaching approach – Jenny’s lecture and print resources for on-campus and off-campus students were complemented by a site on the LMS which had basic components such as the study guide, useful links, a calendar and PowerPoint slides of weekly lectures. In addition, the site had several custom made multimedia components such as a series of twelve hyperlinked concept maps with audio clips (O'Reilly & Samarawickrema, 2003; Samarawickrema & O'Reilly, 2003a) and an interactive writing
tool (O'Reilly, Samarawickrema, & Maiolo, 2003). The concept maps linked the key concepts to the textbook and to the topics taught in each lecture, giving a holistic picture of the topic to peruse prior to any in depth learning, or to use for revision. The writing tool guided a learner through a series of basic comprehension questions on a video case study. The program organised the responses to the comprehension questions into a logical argument which demonstrated to the learner how to structure an argument. Five three-minute video case scenarios on CD ROM were the foci of the discussion forum activity and were also covered in the class tutorial. The site also had self-test quizzes for each week and a semester end evaluation survey. All resources on the site, as well as the textbook and the specially designed printed study guides, were integrated closely (Samarawickrema & O'Reilly, 2003b).

Jenny’s adoption of web-based learning and teaching was a blended approach. Her resources were integrated, and facilitated a community of inquiry which encouraged free exploration of ideas via the discussion forum. These discussions were triggered through case studies provided by video. There was a strong teacher presence online which was also supported by the face-to-face sessions.

**Rewards** – Four refereed articles resulted from the innovation adoption and Jenny’s innovation was highly acclaimed in her faculty. This success was observable to others in the Faculty of Business and Economics and stimulated her colleague, Pauline, to adopt and innovate. Consequently, Jenny’s reward was increased status within the faculty, recognition as a leader, and the award for her team of a Vice Chancellor’s innovative teaching award for that year.

**Pauline**

Pauline, was a lecturer in Industrial Law, who had thirteen years of teaching experience in higher education. Her unit was taught to an undergraduate student group of nearly 150 students based on-campus as well as off-campus. She prepared printed study guides for her off-campus learners while the on-campus students had a weekly lecture-tutorial and were able to purchase the printed resources provided for off-campus learners at the University bookshop.
Adoption – Pauline’s adoption of the LMS was entirely influenced and encouraged by her colleague Jenny’s use of the LMS and she considered Jenny to be a role model. Adopting the LMS offered Pauline advantages such as flexibility of access, immediacy and the ability to enhance the on-campus exchange amongst her students.

It’s a very dynamic exchange, particularly the discussion postings. – Pauline

Student demand indicated that it was compatible and consistent with the values and experiences of the potential users which led her to trial the technology -

[T]he technology was there and I needed to explore it. – Pauline

Teaching approach – Her website contained a unit outline, calendar, hyperlinks, and PowerPoint slides of her weekly lectures. It also carried the library reading list which was digitised and downloadable, as well as regular alerts to new changes to the law, making it a repository of resources. She also had a moderated discussion forum which was not topic-focussed but was an open forum that addressed administrative issues as well as content related issues. While her site complemented her traditional on-campus and off-campus teaching efforts, the site and her other learning resources were not integrated. Although a majority of her learners logged on to her site to read queries raised by a few students and her answers to those queries, the LMS site was not central to their study because the resources were mostly supportive and not linked to any assessment.

Rewards – She considered her main reward was the student demand for the site. Being able to reach off-campus learners was hugely satisfying for her. She was, however, aware that her site needed further development and had already made plans to add quizzes in the following semester.

Pauline’s face-to-face teaching was enhanced by her web-based approaches but since her classroom activities and her web-based resources were not integrated, her site could not be described as demonstrating a blended learning model.

Both Pauline and Jenny concurred that the Faculty of Business and Economics provided workshops and short training sessions in the use of specific software packages and
specifically on the use of the LMS and its tools. Good, prompt technical support provided within the faculty further encouraged technology use, though employing the technology in a pedagogically appropriate way was not part of that training. This lack of guidance was evident in Pauline’s site which was mostly repetition of the content delivered in her face-to-face class and in her printed study guides for off-campus learners. Pauline’s teaching approach was web-enhanced unlike Jenny’s which was a blended approach with a strong teacher presence and a sense of community among learners.

**Faculty of Education**

Patrick moved from a University teaching position he held for three years to being the faculty web manager and the Flexible Learning Coordinator. This appointment was related to the faculty’s strategic business plan to help teaching academics to adopt online teaching, to further faculty policy in the area and to ensure its implementation. Since, in this role, Patrick did not have a specific unit to comment on, his comments were related to adoption and the teaching approach in the Faculty of Education in general.

**Adoption** – Web-based technology adoption was largely seen as being driven by student expectations. Students demand value for the dollar and require that the University is accountable, giving them exposure that is current and acceptable to prospective employers.

To some extent the students are starting to drive some of the changes, because even with the lecture and the tute, they’re saying: ‘Well, is this information up on the website? Are you going to put your PowerPoint slides up on the website? Are you going to have a discussion forum for this?’ – Patrick

He considered that adopting flexible approaches was also important in encouraging corporate and industry clients as well as overseas students.

In order to promote faculty-wide adoption, as the web manager, Patrick set up websites for many staff who were unable to do so. For others who were more technologically
skilled, he provided templates which they could populate. This enabled many staff to have basic websites on the LMS.

While he liaised with central services such as Information Technology Services (ITS), he also promoted the faculty’s flexible learning policy by

... getting academics to re-examine the learning objectives for courses. They’ve been teaching for years and years and it is about actually having a fundamental look at their pedagogical strategies and come up with something that is going to be satisfying for them, their students and also a satisfactory result for the faculty. – Patrick

As the faculty globalised its programs, teaching academics needed to be assisted to extend their teaching approaches overseas.

We are delivering a number of courses to Singapore and we are now looking at China. In Singapore we started out with the Bachelor of Outdoor Sports and Rec and so what we deliver there is printed material, face-to-face classes and excursions using tutors hired by our agents there. And we deliver CD ROMS with video clips and so on. – Patrick

In a context where the faculty was attempting to extend its reach, factors that promoted the adoption of web-based approaches, such as staff development, had a major complementary role to play.

These people are my clients so I understand about their insecurities [related to adopting new technologies]. – Patrick

Therefore, staff development was necessary to make adoption easier, compatible, less complex, and to assist staff to see the relevance of technology use in relation to a learning need. Staff development, even at a low level, to overcome fear, build confidence and change work practices, was viewed as useful in contributing to adoption.

You have to remember that there are some people out there with very very limited skills. I mean, they don’t even know how to organise their mail client. – Patrick

He recognised that supporting policies are also necessary for staff to be comfortable, feel supported and take on the additional tasks of developing resources for a web environment.

**Teaching approach** – Teaching approaches used in the faculty were mostly traditional face-to-face lectures or off-campus print materials enhanced with web-based resources.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

Few had adopted a blended learning approach with an online teaching presence supporting a community of inquiry. Many teaching academics had individual websites for their units on the LMS and Patrick felt that this gave many teaching academics a sense of personal satisfaction.

A lot of academics like having a website because they feel it's a bit of a, kind of, personal accessory and also because it gives them a greater profile. – Patrick

However, having a website on the LMS was increasingly a faculty requirement though much of the material online was information rather than interactive learning material.

A lot of this stuff online is basic, I mean, it’s information. Not education. We’ve got information confused somewhere with education. – Patrick

This again supports Patrick’s opinion that there is a need for staff development that goes beyond learning to use the technology only, to using the technology in pedagogically appropriate ways.

Rose

Rose had been a lecturer in History Method for nine years and had always taught in the traditional lecture-tutorial mode. Her current unit was offered to a group of third year on-campus undergraduate students whom she met twice weekly at a lecture and a tutorial.

Adoption – She acknowledged that exploring new technologies for learning and teaching was not a priority for her because she was engaged in her doctoral work and also because the use of technology was new to her and her competencies in its use were basic. Adopting web-based learning and teaching approaches for Rose was an authority innovation directive driven by faculty market expansion plans.

There is no discussion with people like me. I was simply told early last year, Rose, you are going to have to deliver your method off-campus. – Rose

However, she viewed the main advantage in adoption of the LMS as the ability to use the discussion forum to maintain communication with students. It was compatible with her existing value that history teachers she trains must be technologically competent and be able to demonstrate those competencies in their classes.
According to her, technology adoption was complex as her training and staff development needs were very basic and therefore not met by the available training opportunities.

**Teaching approach** – Consequently, Rose had a basic site on the University’s LMS with a unit guide, hyperlinks and an unmoderated discussion forum. This site was set up for her by the faculty web manager who also provided technical help. The site met the minimum requirements of a website in the faculty. Her site did not have lecture slides because

> I don’t know how to use PowerPoint and won’t dare try it first with my students. Sadly, it is true. – Rose

There was little activity on the site and the discussion board had one message from Rose and only a couple from her students. Participation on the discussion forum was not a required nor assessable aspect of the unit, and was not central to the pedagogical approach of the unit. The classroom and tutorial interaction was supported and complemented by a comprehensive set of print resources prepared by her which were given to all students. It was obvious that her website was a superfluous add-on but was created as a response to a top-down directive about which she was resentful.

**Rewards**- Adopting the LMS gave Rose no rewards. She viewed it as yet another task that took her away from her doctoral studies.

**Samantha**

Samantha had only two years experience as a lecturer in Early Childhood Education and with the use of the University LMS. She taught an undergraduate class and incorporated the LMS with her traditional classroom face-to-face teaching approach.

**Adoption** – She adopted web-based learning and teaching approaches because she was convinced of the capabilities of the web to improve learning and therefore it was compatible with her values, and because her area of research was innovation in early childhood education using online approaches. Adoption of the LMS was also an
authority innovation directive as she was mandated in her employment contract to deliver her unit online.

[A] part of my own appointment was, you know, to get an online presence. – Samantha

She found web-based approaches to be uncomplicated and adoption easy. Her innovativeness was spurred on by her curiosity of the capabilities of the LMS. Her readiness to trial and experiment and her previous experience and knowledge with another LMS (Blackboard®) made her adoption decisions easy.

**Rewards** – Apart from learner satisfaction and positive feedback from students, her reward for adoption was personal satisfaction and also an increased recognition within her faculty as indicated through the following comments.

I’m so excited. I feel really lucky to start an academic career at a place like Monash. There is a lot of support and there is a lot of freedom. No one goes on saying ‘you should not be doing that’. – Samantha

It’s my first year at Monash and with the work I’m doing, more people are wanting to hear about it so I guess it’s a bit of an opportunity to share what I’m doing and get into contact with other people who can tap me into their next project. – Samantha

**Teaching approach** – Samantha’s site had all basic requirements such as a unit guide, calendar and useful links. Its main feature was that it was set up as a complex problem based learning (PBL) site with the problem developing each week concurrent to her classroom session which delivered the relevant theoretical background to the problem. Students worked in teams on tasks which were scenario based, and incorporated role play using the discussion forum. She also used the chat facility to support conversation among those playing parallel roles in different teams. The time release function was used to release weekly tasks. The information sharing involved in the tasks was mandatory for joint problem solving. Online participation was not assessed though the unit assessment, through a class presentation and an examination, relied on the ideas developed via the online discussion.

The site required extensive and ongoing maintenance and was closely integrated with the work in the classroom. Her site had a strong online teacher presence which facilitated a collaborative community of inquiry that freely explored ideas, critiqued and
debated the case study. Her teaching approach was a blended e-learning approach with multiple forms of communication to meet specific learning needs. She modified her teaching approach to draw on what she believed was the best in the technology available.

Ted

Ted was a senior lecturer teaching Counselling to a final year undergraduate on-campus group as well as to a small off-campus group based in Singapore. While he had been a tertiary teacher for eight years, he was relatively new to teaching with web applications as it was only earlier in the year that he set up a site for his unit on the LMS.

Adoption – Ted was forced by a top-down authority innovation directive to teach online as well as to teach an off-campus group in Singapore.

There was a big push to go online and we were madly scrambling . . . – Ted

He viewed this move as a faculty attempt at ‘modernising’ though he saw no advantage in using web-based approaches to teach Counselling. He strongly argued that teaching in an area where skills are developed and learned through observation in real life situations, and where learning must also be demonstrated in real life situations, must be done face-to-face and therefore web-based or distance education techniques were unsuitable and incompatible.

Teaching approach – Ted was a strong believer in the traditional face-to-face teaching approach. To meet the faculty requirement, he developed a basic site with unit information and hyperlinks using a faculty template. Since he was convinced that online approaches were not suitable to teach Counselling, he made no extra effort but passed on his files to the faculty web manager to load on to the site at the web manager’s convenience. He used the discussion functions of the LMS but was disappointed that participation was uneven and that messages were unable to capture and interpret emotions such as anger, depression and pain, important in a Counselling course, which defeated the educational need. However, the email facility assisted in the administration aspects of his teaching and in allowing Singapore-based students to contact him. His unit
had a comprehensive set of print resources which were made available to all students. Ted’s site on the LMS was nothing more than an add-on.

**Rewards** – Ted did not consider his experience of adopting web-based approaches to be rewarding. Overall, his experience was soured by his resentment at the authority directive to incorporate web-based approaches and he was convinced that web-based approaches made students skilled at managing information rather than helping them to operate in the real world responding to real problems as professional counsellors.

The Faculty of Education, unlike the other faculties, has a web manager (Patrick) who assists staff in their web-based teaching. While providing several levels of support, at a beginners’ level the web manager provides templates for teaching academics to populate with their information, or will do that task for them, ensuring that all teaching academics have a basic web presence. All networking and cross-linking between websites that belong to the one course are done by the web manager which is, again a level of support not offered in other faculties. The faculty also offers some basic training in a few software packages but draws on the University LMS training for their staff. However, faculty directives to adopt the LMS, confirmed by some teaching academics, have led to resentment.

**Faculty of Engineering**

**Angus**

Angus was a sessional lecturer in Reliability Engineering who had taught for eighteen years at tertiary level and was hired to specifically redevelop a unit for an off-campus post-graduate student group.

**Adoption** – Initially for Angus, adopting online teaching approaches was a top-down policy directive and not a choice. However the presence of all eight conditions for technology adoption cited by Ely (1990, 1999) were clearly evident from his interview. Dissatisfaction with the status quo, existence of knowledge and skills, resources, time, rewards, participation, commitment from those involved, and leadership were all evident.
Dissatisfaction with the status quo included political problems related to the threat of shutting down sections of the faculty at the Gippsland campus owing to flagging student numbers. To discourage possible negative influences caused by such uncertainties, and to revamp and redesign units, web-based approaches were adopted to demonstrate innovativeness, and provide a *relative advantage*. The online interaction and communication were expected to boost student numbers. A funding grant for educational design and for multimedia developments provided the much needed resources and rewarded Angus with a new interest. He admitted to *trialling*, experimenting and enjoying the experience.

The innovation was not *complex* for Angus as he had the knowledge, skills and competencies which were a significant *advantage* in adoption. He replaced paper based assignments with electronic ones, and developed a simple system of electronically managing and administering these. Drawing on his advanced PowerPoint skills, he mocked up animations which the multimedia team then developed into more sophisticated presentations.

**Teaching approach** – His site on the University’s LMS featured a unit outline, animations of simple engineering concepts, video clips and email assignment submission and return. He developed these components iteratively. Being a part time sessional lecturer with no research commitment, he was able to devote time to learn, experiment, adapt and integrate the technology into his practice. The iterative development allowed him to modify and concurrently adapt the supporting print resources. As a result, his resources were integrated but he did not use online discussion forums for debating and discussing ideas. His online teaching presence only occurred when he returned assignments and feedback by email. His site was therefore an enhancement rather than a blended learning site.

**Rewards** – The interaction with the colleagues in the faculty and across the University which was necessary to develop his unit, was Augus’s primary reward. The positive interaction with the wider University made him feel a part of a team and gave a sense of belonging to the institution, reinforcing his adoption motivations. While this wide network exposure helped him to seek out help when required from educational
designers, multimedia developers, trainers, and others in the faculty, he found asking questions and working in teams a positive and rewarding experience. It was also rewarding and satisfying to him that a unit that was previously losing students was now gradually improving in enrolment numbers.

The Faculty of Engineering, at the time of this study, was undergoing difficulties due to falling student numbers. While web-based applications were promoted, the Faculty’s key objective was to reach a wider student body. A focus on training and support was therefore not evident.

Faculty of Information Technology

Marg

Marg had taught for eleven years in higher education, had a unit website for seven years, and since the previous year had been using the University’s LMS. She was also contributing to the University pilot of WebCT Vista®. Her unit in Information Systems was taught to a third year undergraduate on-campus student group.

Adoption – Marg adopted the LMS to make portfolio-management easier for students:

[Students] have a soft copy portfolio and everybody within the team can access the portfolio, the tutors can see what's happening, and they have the soft copy which is then used for assessment at the end of semester. It used to waste a lot of trees and cause a lot of anxiety for the students. – Marg

Other advantages she saw were the possibility to improve interaction between students as well as between students and tutors, to increase flexibility, to develop a common learning space for all learners and teachers on all campuses and to develop a student centred approach through student involvement. The LMS also offered the advantage of an online discussion forum as well as the ability for students to keep records of all their communication related to their team project work.

Prior to using the LMS, she had developed her own website as she had possessed the necessary skills and knowledge to do so. Adoption was encouraged by her information technology background and because the technology was not complex.
**Teaching approach** – Her site on the learning management system was iteratively developed. It contained a unit outline, calendar, PowerPoint slides of weekly lectures, and links, and was later expanded to include web-based templates for practice exercises and self-test quizzes, both designed to develop learner independence. In her next iteration of the site, she moved the team project to the LMS by providing instructions, guides, and templates on the web as well as an interactive report writing tool developed with the help of multimedia experts. Projects were undertaken by student teams that worked together and submitted a report. The interactive report writing tool guided learners to respond to specific questions after which it generated a document in a report format thus giving the students their own information in a model report format. Each individual team also had their own conference forum and a portfolio to store documents. The team project report was assessable and therefore compelled students to use the LMS. To encourage student feedback that would help improve her work, she also incorporated an anonymous online survey. A weekly lecture with printed hand outs and a tutorial supported these resources.

Marg’s effective integration of face-to-face class sessions and web-based technologies demonstrated a blended e-learning environment. Activities designed for student groups to work in teams online facilitated a community of inquiry through tasks that called for dialogue, negotiation and agreement. Through her teacher presence online, she focussed and facilitated the learning experience, resulting in a successfully blended e-learning approach.

**Rewards** – Marg’s main reward was the satisfaction derived from successfully adopting this approach.

> I do enjoy it and my satisfaction has increased because of using new things and different things and they’ve been successful, so that increases my satisfaction. – Marg

Being selected to pilot WebCT Vista® for the University was an indication that her opinion and judgements were valued.
Ben

With forty-six years in tertiary teaching, Ben had the longest teaching experience among the study’s participants. As a research fellow, he taught Quality and Reliability in Engineering to an on-campus postgraduate class in the traditional lecture and laboratory/tutorial mode, and had incorporated the LMS into his teaching only over the past two years.

Adoption – Though Ben preferred to teach in the traditional face-to-face mode, economic advantages forced him to adopt the LMS.

There is nothing like old face-to-face teaching. There’s nothing like small groups and you make sure that everybody participates. – Ben

He had previously offered his class an extensive set of print resources which, due to budgetary constraints, he was no longer able to provide free of charge. The LMS was therefore adopted for the economic advantage of delivering material to the students without the faculty incurring a cost.

There is also a whole suite of possibilities on the website. . . . it’s [WebCT’s] too clever by half. Does all kinds of clever things, but you’ve got to first get around to learning it. – Ben

Ben viewed possibilities, such as offering online quizzes and the use of the LMS assignment drop box, as advantages, though learning to use them, he felt, was time consuming. While student demand strongly stimulated his adoption, some targeted help, he stated, would contribute to speeding up his adoption of specific tools in the LMS.

Teaching approach – By placing the unit guide, hyperlinks, PowerPoint slides and other Word documents (handouts given in class) online, Ben’s students did not have to purchase the material he created. The site served mostly as a delivery channel for the resources he used for his on-campus teaching. The LMS email was used for assignment submission. His web-based teaching approach was mostly an add-on, used by students because it was the delivery channel for all the main unit resources.

Rewards – Ben admitted that the technology was teaching him new skills and that after decades of teaching face-to-face, he was
This was adding to his development as a teacher and complementing his face-to-face teaching. His comments indicated that he was open to exploring new tools and techniques offered by the LMS and that some personalised and targeted professional development in the area would further encourage and facilitate adoption.

The Faculty of Information Technology, like the Faculty of Engineering, was keen to improve student numbers. Yet, both Marg and Ben complained that some computer laboratories in their faculty were outdated and the computers in use were incapable of supporting their current software requirements. They also commented that while technical help was available for supporting the computer laboratories, such help was not available for individuals attempting to use the LMS. As a result, colleagues helped colleagues in the faculty.

Faculty of Law

Penny

Penny was an associate professor who had been teaching in higher education for twelve years. Her current unit in Administrative Justice was for a group of off-campus postgraduate students located Australia-wide (working in diverse contexts such as the police force, mediation board, Department of Education and the mining industry) for which she used InterLearn (a web-based product developed at Monash University which supports extensive communication, discussion and interaction). Her unit was specifically developed for InterLearn as against accommodating and incorporating the technology in an existing unit.

Adoption – For Penny, teaching online was an authority innovation directive that was also funded. The funding allowed her to draw on faculty educational design assistance in the design of both the InterLearn site and the complementary print resources. Adopting InterLearn addressed an educational need as well as having advantages such as the ability to accommodate a diversity of professional backgrounds of students, maintain interactions with students across Australia, satisfy market demand for a unit that had a
dispersed market and remain economically viable. Using technology also allowed her the advantage of sharing the students’ responses.

**Teaching approach** – Her website was designed to complement a comprehensive set of print resources specially developed to support the off-campus learner. She described the site to be simple – ‘no bells and whistles in that’.

Since using the technology was crucial, the semester began with an on-campus (optional) session which ensured every student was able to access the site and had basic skills to participate. Since it was an entirely off-campus unit, the strategy here was to get the students discussing a common problem that was not academic, as well as to enable them to meet before they would communicate with each other online.

The key element on the site was its extensive discussion moderated by Penny. For the students, participation in the discussion was mandatory though that participation was not assessed. Answers to assessment activities had to be shared on the web as these involved problem-solving applicable to the students’ varying work contexts (such as the police force, mining industry, education department, etc), and demonstrated how one principle could be used in a range of contexts. At the end of the semester, the site became a repository of information with contributions from all students demonstrating the applicability of administrative justice to many different areas.

Penny’s teaching approach was a blended e-learning approach which effectively integrated the print resources with web-based technology. The blended learning approach was particularly effective because all students participated online with free and open dialogue, and functioned as a community. The teacher presence on the site facilitated the learning experience. The blended learning approach adopted by Penny supported higher levels of learning through critical thinking, reflection and debate.

**Rewards** – Penny’s satisfaction came from her students and the community those students created.

Obviously there is satisfaction in mastering new ways of teaching, in creating new options for students. I certainly got a lot of satisfaction from the very favourable comments I’ve been getting [from students]. To give an example, I have an email from
a woman in Sydney who was a head of a tribunal to say that she was aware that one of her employees was doing our course and had noticed a huge improvement in her competence on the job, which she attributed to having done our course and would be interested in doing it herself. Now, you don’t get that kind of email from the public very often. – Penny

Penny’s work was also a useful model for the faculty in formulating policies related to introducing web-based approaches.

I think what came out of this was a more raising of staff awareness about teaching issues and technological possibilities . . . I was one of the front line people, yes. And I suppose that what I did really kind of helped the faculty to decide was what kind of model they wanted for developing courses in the future. They wanted a lot of direct control here over the development and the running of it. – Penny

The Faculty of Law has its own Flexible Learning Unit which provides educational designer support (and facilitated the adoption for Penny). This unit preferred to have their faculty staff work with them rather than the access the centrally available educational design support.

Stefi

Stefi was a lecturer in Property Law who had been a tertiary teacher for six years. Hers was an undergraduate unit which had over 500 students who were divided into four groups or streams. Three of these groups were taught face-to-face, on-campus by three teaching academics. However, as she explained (referring to the fourth group),

One of the streams doesn’t have a face-to-face lecturer; they have a virtual lecturer and I’m in that role, and that stream we call the virtual stream. – Stefi

Adoption – Being relatively new to web-based teaching, Stefi was strategic in her adoption of technology and considered it compatible with her values as a university teacher.

I got offered an extra loading for it, and on top of that I know that getting involved with flexible learning practices is something that will be useful for me in terms of strengthening my CV, and I have a Doctorate. In the scheme of things I’m only at lecturer level. So I can see that in terms of teaching aspects of my profile, there are areas that could be strengthened. – Stefi

Stefi, therefore, volunteered to teach the ‘Virtual Stream’ even though she had no prior experience of using any web-based teaching, and had low technical skills.
Teaching approach – Students in the Virtual Stream accessed their resources through the Portal. The my.monash portal (Portal) is a personalised ‘one stop’ service to web based resources that each individual student is likely to need while at Monash University and provides easy access to both administrative as well as unit-related information, including communication facilities. The unit-related information can be expanded by the teaching academic of that unit to carry unit content as well.

Stefi’s unit site on the Portal had links to PowerPoint slides of weekly lectures and a discussion forum. The site also had a link to recorded lectures of Stefi’s face-to-face class, accessible via Monash University Lectures Online, a recorded lecture service provided by the University library which delivers digital audio recordings of lectures to Monash University students via the internet within minutes of the scheduled conclusion of a lecture. These lectures are normally available for the duration of the semester in which the unit is offered.

What we actually do is record one of the face-to-face streams. That audio recording then goes on the web, and the Virtual Stream students will then listen to that live lecture . . . we don’t deliver the Virtual Stream as someone who sat down and just spoke to a microphone. I think they get a slightly more natural style if it’s been recorded from a live lecture . . . so as the lecturer you’ve got to be careful when anyone asks a question, you repeat the question back and then answer it so that the students listening online have got the context. – Stefi

Stefi’s experience with the online discussion forum using the Portal was not a positive one as it ran into technical problems at the start of semester. As a result, for the first few weeks of the semester, students were unable to access the discussion forum.

Colleagues confirmed her negative opinion.

. . . everyone [other staff] here tells me ‘oh, don’t use the discussion forum, it’s cumbersome and it’s awkward . . . – Stefi

Since technical problems deterred the students from accessing the site and participating in the discussion forum, they could not be convinced to use the site later in the semester. She explained the low use of the discussion forum as follows.
Students don’t seem to want to use the discussion forum, they don’t tend to direct questions to me via that vehicle, and that’s probably because I tend to be fairly happy to answer individual emails. So, I guess in a sense I haven’t really encouraged them to use the discussion forum to direct questions to me. – Stefi

As a consequence, Stefi was inundated with individual emails from students. Her concerns also extended to getting her Word and PowerPoint files online without delay, and uncertainties about whether the taping of lectures worked and whether she as the teacher was careful enough in her recorded statements.

In some of the areas that I teach there are comments that I could make about the government, or this or that, and I do feel a little restricted in what I say. – Stefi

Using web-based learning and teaching approaches restricted Stefi’s freedom as a teacher, as a record of her statements would be available online. In a face-to-face classroom context, there is no record of the statements made in class which at times she felt was an advantage.

**Rewards** – Stefi volunteered to teach the Virtual Stream with the hope that she would find online teaching a satisfying experience. However, this was not the case.

If I had the time to actually set up the proper online unit, I think I’d get a lot of satisfaction out of that. – Stefi

Her experience with the discussion forum that could not be accessed by students at the start of semester, followed by the extensive email interaction with students, confirmed her negative views related to teaching online.

Teaching in the Faculty of Law occurred mostly through traditional face-to-face methods and at the time data were collected for this investigation, no teaching academic from this faculty used the University’s LMS though a small minority used InterLearn. The general faculty attitude was not encouraging nor motivating as voiced by Stefi:

They feel that it’s not the way that students should be learning; that face-to-face contact is a better mode of lecture delivery. There’s also the feeling that it’s just increasing our workload. – Stefi

The staff were also unaware of the basic technical support provided by the faculty which enabled them to seek help in the area. Though the faculty also employed educational design support via its Flexible Learning Unit, the services of this unit were mostly
accessible for units that had grant funding and teaching academics like Stefi remained largely isolated from this service.

**Faculty of Medicine, Nursing and Health Sciences**

**Anna**

Anna was a sessional lecturer who had been teaching in higher education for three years and had been using the University’s LMS over the last two of them. Her unit in Healthcare Systems was taught to an undergraduate on-campus group of 29 students using a site on the LMS complemented by traditional lectures and tutorials.

**Adoption** – Anna explained that being located at the Monash Medical Centre (a teaching hospital of the University) placed her in an off-campus situation, resulting in a need to adopt web-based learning and teaching approaches to reach her students who were on the main campus. The *relative advantages* she cited were tied in with technology considerations. By adopting the LMS and its communication tools, her students were able to communicate with her more easily.

> We are the ones that are off-campus! And they can’t just come and knock on the door or access us quite so easily. It then becomes important enough to be able to maintain communication. – Anna

The communication tools on the LMS were also useful when students moved off-campus to serve in rural hospitals during their professional placements. For Anna, the discussion forum was a common space for communication during the period students were on placements.

> It’s a way of maintaining communication with them as they scatter about in their professional placements. – Anna

Emphasising the *trialability* of the LMS she explained,

> I find it quite interesting. I could sit here and fiddle with it and try different things endlessly. – Anna
Being a sessional teacher with no research load, she had the time to *trial* the innovation and to make it work and iteratively develop her resources and her site. The other contributing factor to adoption of the LMS was the technology itself:

> A good fast computer encourages working on WebCT. – Anna

She had strong network links within her faculty, was motivated by a colleague and inspired by others around her who used the technology (see Carman).

**Teaching approach** – Her site on the LMS featured a unit outline, calendar, discussion forum, scanned library readings, PowerPoint slides of weekly lectures, links and provision for online assignment submission. While the site supported and complemented the weekly on-campus lecture, its key role was to provide a common space for the class to maintain communication with each other and with Anna herself as the students dispersed for three weeks in the semester to undertake their rural placements. The discussion forum was especially used during the period students were on placement and focussed on problems and issues related to their professional practice in rural settings rather than on specific subject matter.

> It is a means of discussing what their activities are and for them to communicate and provide each other with feedback or debriefing on the sorts of activities that they are doing. . . . So we’ll be all away, but keeping in contact together without using email. – Anna

The online assignment submission was made available to assist submission of assignments which students undertook in their rural placements.

While Anna’s was a blended teaching approach, it was also about increasing access to resources. She facilitated the group connection by using the discussion forum, especially when students were on placements and not on-campus, and blended the face-to-face and online learning experience.

**Rewards** – Anna’s satisfaction was quite evident as she anticipated the growing importance of web-based approaches and how she could adopt these approaches in her teaching, particularly when students went away on work experience placements and would therefore be isolated from the course.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

I find it really interesting, can think of lots of ways that we might use it in the future . . . There are potentials to use it because our students go on placement and are scattered . . . medical students are, when they actually get out on their rotations. Yes, I can see us using it more and in different ways and it doesn’t stress me. – Anna

She was keen to explore and use the technology to be a better teacher.

I think the technology hasn’t been used to its potential . . . I can think of better ways for learning, and I’m keen to give it a go, and find out if students find it useful and whether from my end, you know, be a better teacher. – Anna

Web-based teaching also suited her on a personal level because it made no demands on her public speaking skills.

I work as a clinician and I usually train and supervise, you know from a professional practice point of view. Why I love WebCT is because I don’t have to stand up in front of students . . . you know WebCT is another skill of teaching, and I want to develop that skill. – Anna

Anna believed that learning to be a good online teacher helped her to be a better classroom teacher. She recognised that the two sets of skills were complementary and what lay at the heart of good teaching was good integration that facilitated a good web-based and face-to-face learning experiences. Ben from the Faculty of Information Technology shared this view that the skills acquired as an online teacher helped him to become a better face-to-face teacher.

Carman

Carman, a senior lecturer with thirty-four years of tertiary teaching experience, taught only on-campus students. Hers was a unit in Food Science and Nutrition.

Adoption - Adopting the LMS was a definite advantage to Carman because, in contrast to an open access website, WebCT® provided students with the privacy of their own dedicated site and space, and she perceived the LMS and its features as supporting an educational need.

I can see it’s [the learning management system’s] potential – Carman

A major pedagogical requirement of Carman’s unit was the need to accommodate students’ learning while they undertook placements in hospitals. She pointed out that
adopting the innovation was compatible with the current and potential needs associated with student placements.

. . .because we are teaching in hospitals as well as teaching in the university, we really need our students to have access in lots of different venues. I could see ahead that in our later years in year three and year four, we would have half the students at the Alfred Hospital¹ and half the students at the Monash Medical Centre² and they might want to access lecture material at the same time and WebCT seemed to be an excellent way of doing that. The fact that when students started getting placements they’d be in many different areas and yet they could all access their material in WebCT seemed to fit our needs very closely. – Carman

This compatibility was corroborated by the student demand for use of the LMS.

The students’ acceptance of the technology has driven other staff in the unit to then take it up. Because the students have it one year and they get used to getting the materials from WebCT so they say to other staff in another course, ‘can we have this material on WebCT’ and so they are pushing it. – Carman

Her interest in technology led her to seek opportunities to observe others in the faculty who were experimenting with and trialing the LMS. This strategy stimulated her to discuss the new idea with peers who also shared their innovation evaluation information with her. As a member of a small pioneering and collegial user group, she participated in, ‘a peer-to-peer network’ (Rogers, 2003, p. 16) which was informative and encouraging and contributed to developing an awareness of technology use at faculty level. That interaction provided her with the opportunity for reflecting on faculty use of the University’s LMS and then extending its use to suit her needs, as well as demonstrating it to other interested staff within her department, like Anna.

¹ A teaching hospital of the University.

² A teaching hospital of the University.
Rewards – She had the status of leader related to using the LMS within the department, and performed the roles of mentor, role model and advisor as does an opinion leader.

I’m on each of the BN&D³ courses as a designer. So I can help staff with any problems that they have. – Carman

Because I was able to get one unit with material ready on WebCT and then other people were able to see what’s possible and they’ve gone and done it and so it gradually grows to when we are all using it and I think that’s the way it all happened. – Carman

Carman identified her reward as having a satisfied student user-group.

The technology is supporting you to teach more effectively, and that’s very satisfying, when the students come back to you and say ‘I really enjoyed it’. – Carman

Teaching approach – Carman supplemented her traditional lecture-tutorial delivered on-campus, with a WebCT® site. The main features of her site were a unit outline, calendar, links, and PowerPoint slides of weekly lectures and cases requiring preparation prior to tutorials. WebCT® was used to deliver case studies to ensure that learners were prepared before they came to class with the objective of encouraging higher order thinking and independence in their learning, while the case based approach reflected an effort to integrate their learning with real life situations. The specific approach to using case studies to promote independent and higher order thinking demonstrates a step towards blended learning. Quizzes and model answers on the site provided additional self-learning assistance. Student research projects were loaded onto the site to build an information repository as well as to encourage information sharing. Discussion was not carried out on WebCT® with the weekly tutorial compensating for this.

³ Bachelor of Nutrition and Dietetics
Carman’s teaching approach can be described as web enhanced. Her site did not use the discussion and communication features of WebCT® and therefore, her site did not have an interactive teacher presence. Her teacher presence was mainly evident through the face-to-face classroom session.

Simon

Simon was a senior lecturer with fifteen years of tertiary teaching experience and ten years of experience as an online teacher. His unit in Mental Health Nursing had a group of 35 post-graduate off-campus students.

Adoption – Simon pioneered the use of an earlier online conferencing system (FirstClass) for eight years before adopting the University’s LMS in the last two years. Simon adopted web-based approaches mainly because of their technology-related advantages.

Interest in the technology, and what it can do for learning. – Simon

He was influenced by the literature at the time such as Mindweave by Mason and Kaye (1989) and contributions of others in the field, and commented on the importance of integrating the technologies with the curriculum (a reason not offered by any other participant).

The pressure to offer his course via distance education led to exploring suitable technology-based options to stay in contact with students. Teleconferencing in his opinion was ‘clumsy’ and weekend schools were becoming less practical as class sizes were becoming larger and students were distributed Australia-wide. Therefore, the adoption of online approaches was driven by a strong educational need.

He identified top-down directives to be present but subtle, and recalled an email in 2000 encouraging staff to use web-based technologies.

There is some pressure for everyone to be using the technology . . . there was an expectation that we would all be engaged with the technology one way or the other . . . that there was some sort of online presence. – Simon

Being conscious of student demands and expectations was important to him.
I think we all have to go and have a look at the technology because the students use the technology and they expect it, and we need to at least know what its capabilities are. – Simon

**Teaching approach** – His unit used a basic site with a calendar, links and extensive discussion activity. His website was complemented by a set of printed study guides which also included readings. All students received the print materials while a non-compulsory on-campus workshop was held at the start of semester to introduce them to the LMS and to ensure that they could all log on. Related to the weekly printed guides were weekly discussion forums on the LMS where participation was mandatory. Each discussion was moderated by him and summarised at the end of that week. Participation in the discussion forums was important for students to refine their ideas to perform satisfactorily in the three assignments. Simon offered a blended learning approach strongly supported by an online teacher presence encouraging higher levels of learning through reflection and critical thinking via the discussion forum.

**Rewards** – His satisfaction and reward extended to his professional career as a university academic. This engagement with the technology and teaching also provided him with a research focus. He based his scholarship in the area and had completed a masters degree in the area of computer mediated conferencing and nurse education.

[I was] very interested in the technology and my scholarship at that stage was about developing the teaching and going to conferences and talking about what I was doing with the technology, so that was my research. – Simon

His rewards also came from the satisfaction his students derived.

Oh, they were long hours but it was fun. And the students, they probably enjoyed it to some extent as well . . . – Simon

Simon’s scholarship and doctoral work was currently focussed on the role of computers in nursing. He was an early adopter who had used a web-based computer mediated communication system (FirstClass) before University-wide adoption of WebCT Vista®, and who had successfully integrated his research interests in his discipline with his online teaching.
Sally

Sally was a lecturer in Psychiatric Nursing, teaching an off-campus group of students at post-graduate level. She had been teaching in higher education for eleven years. She had six years experience of teaching online and over the last two, had adopted the University’s LMS.

Adoption – For Sally, adopting web-based learning and teaching approaches was an authority innovation directive. Her innovativeness was encouraged by Simon, a leader and mentor who was helpful, motivated, approachable and a good resource person who made the technology trialable, observable, and made it seem easy and adaptable.

She was also fortunate to be a part of a strong nurturing and supportive environment from which she could learn and draw confidence.

So I think that the academics actually helped each other a lot and also having the good support of an IT person who was willing to help academics as well. – Sally

Colleagues helped colleagues and motivated peers ran short IT literacy classes and shared knowledge and expertise. Teaching academics learned best from interacting with peers within the school and strong network links within the faculty supported innovativeness and encouraged adoption.

She saw the learning advantage of quizzes and discussion forums, particularly for off-campus learners. These tools, including the tracking tool on the LMS, gave her the advantage of being able to monitor the progress of her learners.

You can teach, but are the students learning? That’s why I’m very fond of the quiz tool.
I do think it can give me some feedback on whether students are learning. – Sally

Teaching approach – Sally’s site on the learning management system had a unit outline, calendar, hyperlinks, PowerPoint slides, quizzes for self learning, a discussion forum, and links to extra readings or videos available through the library. She had also developed an extensive online glossary.

Her resources on the site complemented her extensive print resources which all students received. Participation in four discussion forums across the semester was mandatory as it
contributed to refining ideas for the four written assignments. Information for individually submitted written assignments was drawn from the critical debate in the discussion forum and therefore ensured good participation in the discussion.

Sally’s site illustrated a blended teaching approach which integrated specially designed print material with online components. Her online discussion forums offered a strong teacher presence which facilitated the critical thinking and reflection required for higher levels of learning.

**Rewards** – Sally’s reward for adoption was personal satisfaction and professional growth.

> Mostly I have enjoyed it. Mostly, because it took time away from my other professional activity. Like anything, it takes time, and that time has to be taken from something else. But I think there’s been good professional growth in the area for me. – Sally

Having used a web-based computer mediated communication system prior to adopting the University LMS, both Simon and Sally had experienced frustration related to unstable technology, and the consequence of having to deal with anxious students. However, with the availability of the centrally supported LMS things had changed. The four participants from this faculty (Anna, Carman, Simon and Sally) found their faculty IT support to be easily accessible, encouraging and supportive. Since more students go on placements from this faculty than from any other, methods to keep in touch with them were important. Therefore, this was one of the needs that drove the adoption in all cases.

The faculty offered some training in the use of technology and provided leadership in the delivery of quality health professional education through its Centre for Medical and Health Science Education. Anna, Carman, Simon and Sally all claimed that the faculty had a nurturing and encouraging environment for technology use in teaching and learning, though both Sally and Simon pointed out that its policy structure related to using technology for teaching and learning was lagging behind.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

Victorian College of Pharmacy (Faculty of Pharmacy)

Louisa

Louisa was an assistant lecturer who had been teaching in the tertiary sector for four years and had used the University’s LMS over the past two. Her unit in Pharmaceutical Chemistry was taught to a group of third year undergraduate on-campus students.

Adoption – Louisa adopted web-based learning and teaching to be able to offer her unit to professionals in industry. The advantages it offered were web-based administration functions such as electronic report submission, assigning reports to markers, returning marked assignments with comments, and drawing on skills and experiences of outside lecturers to moderate online discussions and foster interaction. Student demand was another reason for adoption.

Through her network of colleagues she was able to observe the use of the LMS at another institution outside the University which convinced her to adopt, though her isolated city location away from the main University campus did not facilitate exposure to others at Monash University or to University central services.

Teaching approach – Louisa’s site on the LMS was a basic site with a unit outline, PowerPoint slides of weekly lectures, information on practical sessions, useful links and a discussion forum. Her main teaching was conducted face-to-face in the traditional lecture and laboratory practical format, while the site on the LMS provided additional but useful information.

The discussion forum on her site was designed as a problem solving forum facilitating discussion of answers to tutorial questions, including formulae and equations. It was an open forum for students to verify answers and obtain help. While most students may have read the discussion forum, only those students who had questions made postings to the site. Louisa provided responses to questions but did not stimulate discussion.

Louisa used the administrative features of the LMS to make her administrative work easier. Consequently, submission of laboratory reports occurred via the LMS assignment
drop box making it easier for her to assign markers and forward the electronically submitted assignments to markers, online. She also provided feedback and returned marked assignments online.

Louisa’s teaching approach was web enhanced rather than blended because her face-to-face sessions were not integrated with her WebCT® site. Also, she used the features of the LMS more to facilitate the administration of her teaching than to enhance learning.

**Rewards** – Louisa found working with the LMS rewarding and related use of it to her professional development as a teacher.

> I enjoy working with WebCT. Of course it’s not something you just pick up, it’s a whole new learning process. . . . it’s a part of your professional growth. – Louisa

Belonging to a small faculty that was located outside the main campus (in the city), Louisa was isolated from colleagues in other faculties and services. The main disadvantage was that it was less convenient for her to access central support services.

**Faculty of Science**

**Karim**

Karim had been a tertiary teacher for eighteen years. His Introductory Biology unit had been supported by the use of a website for four years while over the last two, he had used InterLearn (not WebCT®). His was a large undergraduate unit with 260 on-campus and off-campus students.

**Adoption** – Karim adopted web-based learning and teaching for the *advantage* it offered in making it possible for resources to be available to those who could not come to class due to clashes in the timetable and to enable greater flexibility in his delivery. Provision of the site was also driven by user demand.

> I think the expectations from the students, they start asking you: ‘Is that on the web, are the lectures going to be taped?’ – Karim

It was also the result of an *authority innovation directive* as it was a faculty requirement according to Karim, to have a ‘presence online’.
We are being told constantly that is the way to go [using the learning management system], so we kind of do it, yes. – Karim

**Teaching approach** – Karim’s teaching involved a traditional lecture and laboratory practical/tutorial supported by a resource intensive website. His unit book and InterLearn site were available to all students, on-campus as well as off-campus. While the off-campus students received printed hard copies of the unit book, the on-campus students were able to access and download it from the website.

The main webpage is essentially a vehicle of information; for providing information to the students as well as putting all material that is handed out to students in electronic form for them to download if they lose their copy or they don’t attend, or whatever. – Karim

The other resources made available via the website were the laboratory practical workbook, PowerPoint slides of lecture notes, self-test quizzes, and an extensive discussion forum

. . . students get asked a lot of questions, to give answers; other students in the group can read those answers and write their own and so there’s interaction. – Karim

While the participation in the discussion forum was non-compulsory, usage tracking data from the site indicated that many more students read the discussion than participated in it. The site is also linked to ‘Tools for Science’, a complementary website specifically developed by a small faculty team for undergraduate science students, which gives an interactive introduction to quantitative research methods used in science. His lectures to on-campus students were recorded and provided online via Monash University Lectures Online. In addition to being available for student consultation during regular office hours, he also interacted extensively by email with students.

Karim’s teaching approach was web enhanced. He provided ‘more of the same’ by providing a recording of his face-to-face lecture online and by making available downloadable files of his printed study materials. It was not mandatory that students used the InterLearn site or the Tools for Science site as they only enhanced and complemented the face-to-face session and the print material.

**Rewards** – His reward was the satisfaction and knowledge that a job was well done and this was confirmed by student feedback.
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

It’s challenging, of course it’s mightily challenging and I think at the end of the year I would like to know that I did a good job and that brings a lot of satisfaction. – Karim

Sheryl

Sheryl had been teaching in higher education for twenty years and had used a website for her unit only in the last two years. Her unit in Astronomy was for a group of 210 on-campus undergraduate students.

Adoption – Adoption of web-based approaches was an authority innovation directive. As the unit was about Astronomy, adopting a website provided the advantage of accessing an extensive set of links to sites (such as NASA) with rare images which were regularly updated, as well as many free resources. She also used the LMS for administrative functions and saw its advantage in reducing workload.

Teaching approach – Sheryl had developed a site on the University’s LMS with extensive hyperlinks and self assessment questions. The main features of her resource-based website were the links to images of space, freeware such as HomePlanet and Virtual Telescope which students could interact with, and a range of similar resources which though important, would have been too expensive for the University to provide. She also used a textbook which had its own CD with videos and website.

Much of Astronomy is visual. . . . At the beginning of the semester there were 30 moons around Jupiter and by the end of the semester there were 60 moons around Jupiter, so there were discoveries all the time and we followed it by clicking onto the sites on the web. – Sheryl

However, Sheryl’s main teaching was delivered via a traditional weekly lecture and a laboratory practical/tutorial session. She used the LMS for administrative tasks such as releasing answers to assessment items and releasing marks to students. Her teaching could be described as web enhanced. Her class sessions were enhanced and complemented by the web resources but they were largely a loose set of resources and not integrated with each other or with her face-to-face session.

She was cynical about the effectiveness of learning in non-traditional ways such as via online learning, and true to her scientific training, called for hard evidence of proof of advantages to learning before she would consider full scale adoption of the LMS.
Pete

Pete was a research fellow with thirty-eight years of experience as a university teacher and four years teaching online. His Physics in Radiography unit was for nineteen off-campus post-graduate students.

Adoption – Pete adopted web-based learning and teaching because it offered a definite advantage in reaching off-campus learners. He also found the innovation uncomplicated, simple to understand and easy to use. As he was nearing retirement, he had reduced his research involvement and admitted to having the time to experiment and trial the product’s capabilities. The possibility of moving his work (which was in Word files) easily to the LMS was an added advantage. Since a third of his students were from outside Victoria, the communication options offered through the LMS were important to his unit.

His adoption of the LMS was encouraged through the support offered by a wide social network, from peers within the faculty as well as from across the University, especially from the central support services (such as CeLTS, which provided educational design and WebCT® training), for advice and support and general trouble shooting.

[There was] good support encouraging WebCT work, particularly where CeLTS also had people who would support lecturers in sort of liaising with the students, so that there was that extra level, a very important level. – Pete

Teaching approach – Pete’s site on the LMS included a unit outline, calendar, links to image banks, scanned library readings, use of the assignment submission facility, several lively discussions where all students participated, and an online survey. These resources were supported with print materials as well as a textbook with high quality images. He started the semester with a non-compulsory on-campus workshop to familiarise students with the LMS, ensure they could all log in and to provide a general ice-breaking session which he believed was useful in encouraging participation on the discussion forum. This strategy was particularly successful in promoting participation on the discussion forum.

Pete’s was a blended teaching approach where the print material, which was the main learning resource, was tightly integrated with the resources and activities on the
WebCT® site. His discussion forums demonstrated a teacher presence that promoted analysis and critical reflection, facilitating a community of inquiry among his student cohort.

**Rewards** – Pete believed that he had grown professionally as a result of adopting the LMS.

I do things more efficiently, I do things smarter, I think I’m a better teacher. – Pete

Surveys had indicated that students were satisfied with the form of learning offered and this had been immensely rewarding for Pete. In relation to the technology, the increased communication options and the possibility of sending images, and not having to fax them, had been satisfying to him but his satisfaction was also related to the benefits gained by students.

These days we’ve got colour, 3D, motion and all the rest of it, so if you use it properly, the students get the benefit and you feel pleased that it worked efficiently. – Pete

Karim, Sheryl and Pete felt that Faculty of Science support in technology adoption was missing, and adoption was mostly dependent on individual effort. There was no time allocated for online developments, and no financial support or official credit given, they said. According to Karim, the training opportunities offered by the faculty were basic.

I find that whatever is offered is always probably less than what I need. It’s usually very basic. – Karim

They acknowledged that there was dialogue related to policy but it was only at a starting point and that dialogue would have to advance before any formal faculty strategies related to web-based learning and teaching were developed.

The faculty has no burning ambition as far as I know to make everyone use WebCT. – Pete

You have to be involved in the process in the faculty or school of how to offer a particular teaching mode. – Pete
The accounts of the above twenty-two participants demonstrate the varied adoption patterns across the University. Their reasons for adopting web-based learning and teaching approaches are as varied as the extent of their adoption.

**Network exposure**

According to Rogers (2003), mass media are effective in raising awareness of an innovation, and interpersonal communication is effective in influencing an individual’s decision to adopt. An innovation decision process is helped by a supportive social system which becomes involved in a joint problem solving exercise to accomplish a common goal (Rogers, 2003). From the interview comments it was evident that some faculties had more supportive environments (e.g., Business and Economics, Medicine, Nursing and Health Sciences) than others (e.g., Arts), while some faculties were more isolated (e.g., Pharmacy, Law). Rogers explained that innovators are active seekers of new ideas, exposed to media influences, with extensive interpersonal networks that reach outside their local system. He described the innovation adoption decision process as an information-seeking and information-processing activity that decreased uncertainty through processes such as gathering knowledge, being persuaded, making a decision and implementing and confirming an idea. Information about advantages and disadvantages in relation to the adopter’s particular situation is necessary during the persuasion-decision stage, including subjective evaluations of near-peers (Rogers, 2003). Observing peers was important for some study participants, for this reason.

This study revealed that four participants (Samantha, Simon, Jenny and Carman), were influential and were considered leaders in adopting web-based approaches in their respective faculties. They sat on faculty technology adoption committees and were role models to their peers. Stefi, on the other hand, was negatively influenced by the negative comments by her colleagues.

While comments on network exposure and influence of peers have been made in the individual participant descriptions where they were relevant, network exposure will be revisited from an actor-network perspective in the next chapter.
**Teaching approach**

As the responses indicated, the websites of the participants demonstrated varying degrees of complexity. Except for four participants, all used the University’s LMS which provided tools and the templates for developing sites. Few had faculty web masters to set up the individual sites for them. Most developed their sites on the LMS themselves. All participants recognised the need to move with the times, to give their teaching and themselves ‘status’, and to meet faculty requirements and student demands.

All participants used email for communication with students. Email was a facility familiar to all of them and was viewed (by all except one who was overwhelmed by the extent of it) to have a strong advantage in communicating with learners as it offered good relative advantage over what it replaced or supplemented and ensured rapid acceptance, similar to the findings of Geoghegan’s (1998) study.

Multimedia and CD ROM-based resources were not used by a majority of the study participants. All teaching academics prepared class notes, materials and handouts (using Word) and lecture overheads (using PowerPoint) and published these on their websites. Like email, these documents prepared using Word and PowerPoint were familiar resources they already used in their face-to-face teaching and they felt these were beneficial for the students. These were the first and most widespread tools used by all teachers. Though the learning and teaching effectiveness of these is low because they are used mostly for providing information and offer few opportunities for interaction, they provide an excellent baseline against which to judge adoptability.

Purpose-built interactive multimedia was used only by five participants. While resources of this nature would be high on relative advantage, they were not widely adopted, possibly because they were complex and not trialable or observable prior to adoption. Also, teachers recognised that the development of such resources needed funding support and special skills.

Nine participants had included discussion forums on their sites though student participation and contribution to the forums was not mandatory in any one of them. Three of the nine participants had discussion forums set around a specific question and
these participants actively moderated the discussion. The discussion forums of the other six participants were used as a group messaging system only.

In this study, a majority of participants had adopted a blended approach while some used online components as an enhancement only. A few simply had add-on websites that were hardly used either by the students or by the respective teaching academics. These add-on websites only carried unit guide details, such as objectives and contact details, and was a static site that provided basic information only. It was simply an add-on to the face-to-face classroom teaching situation. No participant had a completely online unit. This information is summarised in Table 7.3. It was also noteworthy that those teaching academics who had off-campus student cohorts and were often more aware of the needs of students that could be answered by web-based learning and teaching, were more likely to adopt a blended learning approach with integrated resources and a strong teacher presence online. The technology was less well integrated by those teaching academics who taught mostly on-campus students.
Table 7.3 Participants’ technology adoption continuum

<table>
<thead>
<tr>
<th>Add-on</th>
<th>Enhanced</th>
<th>Blended</th>
<th>Fully online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betty: on+off campus</td>
<td>Pauline: on+off campus</td>
<td>Thomas: on+off campus</td>
<td>None</td>
</tr>
<tr>
<td>Don: on-campus</td>
<td>Angus: off-campus</td>
<td>Jenny: on+off campus</td>
<td></td>
</tr>
<tr>
<td>Rose: on-campus</td>
<td>Carman: on-campus</td>
<td>Samantha: on-campus</td>
<td></td>
</tr>
<tr>
<td>Ted: on-campus</td>
<td>Louisa: on-campus</td>
<td>Marg: on-campus</td>
<td></td>
</tr>
<tr>
<td>Ben: on-campus</td>
<td>Karim: on+off campus</td>
<td>Penny: off-campus</td>
<td></td>
</tr>
<tr>
<td>Stefi: virtual</td>
<td>Sheryl: on-campus</td>
<td>Anna: on-campus</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Simon: off-campus</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sally: off-campus</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pete: off-campus</td>
<td></td>
</tr>
</tbody>
</table>

NB. Patrick was a web manager and therefore did not teach a unit of his own.

Key: On-campus – student group entirely on-campus

Off-campus – student group entirely off-campus

On+off campus – student group consisting of both on-campus and off campus learners

Virtual – recorded lectures downloaded from the web, supported by PowerPoint slides

Table 7.3 provides an analysis of the level of technology adoption. Each teaching academic was at a different level of adoption, but notably, that process of adoption was also iterative. They began by using basic tools in the LMS and gained confidence in the use of the technology. This was followed by appropriate use of the technology to meet their specific teaching need. Therefore, their adoption was a continuum. Also noteworthy is the fact that none of them taught entirely online and nor did anyone have plans to do so. The preferred model was a blended model that either involved a teacher-led class or provided core print material integrated with a range of web-based and other electronic resources.
Reasons for adoption

The findings of the study indicated that web-based approaches and aspects of technology that performed well on Rogers’ adoption attributes (good relative advantage, compatibility with existing practice, ease of use, ability to experiment and trial, as well as observe), were more easily adopted.

Table 7.4 summarises the teaching academics’ technology-related adoption motivations analysed according to Rogers’ perceived attributes.

Table 7.4 Technology-related reasons for adoption

<table>
<thead>
<tr>
<th>Rogers’ perceived attributes</th>
<th>Participants</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative advantage</td>
<td>Betty, Thomas, Anna, Simon, Sheryl, Angus, Marg, Carman, Louisa, Pete</td>
<td>10</td>
</tr>
<tr>
<td>Compatibility with existing values</td>
<td>Don, Jenny, Angus, Stefi, Rose, Samantha, Carman</td>
<td>7</td>
</tr>
<tr>
<td>Simple to use</td>
<td>Samantha, Marg, Pete</td>
<td>3</td>
</tr>
<tr>
<td>Trialable</td>
<td>Samantha, Anna, Angus, Sally</td>
<td>4</td>
</tr>
<tr>
<td>Observable</td>
<td>Betty, Carman, Pauline, Sally</td>
<td>4</td>
</tr>
</tbody>
</table>

Blended learning approaches which used technology (especially discussion forums) to maintain communication were adopted by some teaching academics who had learners who moved around on professional placements (such as medical students and Indonesian language translation students). Adoption was spurred on in situations where students were isolated and entirely off-campus (see Table 7.3). Also important in promoting adoption were the student responses and their demand to use technology.

Geoghegan (1998) noted that in the area of technology adoption, the difference between the early adopters and the mainstream is not so much to do with the technology skills and the preference to use the technology because most university teachers are active users of some form of personal computing. Rather, the difference lies in their focus and
in their approach to change and to adopting new processes. This study showed that many participants embraced technology wholeheartedly. Many were also driven by authority innovation directives and a few of those participants resented the directive and took a non-innovative, minimalist approach to change (as shown in Table 7.3).

Supporting Farquhar and Surry (1994), the motivations and reasons for adoption and the teaching approach of each participant were uniquely different. Comparisons between participants show that the ways in which each of them approached this challenge, and achieved their outcomes, were varied and also changing. Their adoption reasons extended beyond technology-related reasons. These reasons are summarised in seven clusters in Table 7.5: institutional reasons; educational reasons; communication opportunities; colleagues’/network influence; administrative reasons; influence of research and the literature; and personal reasons.

Table 7.5  A summary of reasons for adoption

<table>
<thead>
<tr>
<th>Reasons for adoption</th>
<th>Participant(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Institutional reasons</td>
<td></td>
</tr>
<tr>
<td>Top-down authority innovation directive</td>
<td>Thomas, Rose, Patrick, Simon, Angus, Penny, Samantha, Sally, Ted</td>
</tr>
<tr>
<td>Student demand</td>
<td>Karim, Pete, Anna, Sally, Simon, Carman, Jenny, Pauline</td>
</tr>
<tr>
<td>Funding</td>
<td>Penny, Thomas, Angus, Jenny</td>
</tr>
<tr>
<td>Boost student numbers</td>
<td>Patrick, Thomas, Angus, Louisa</td>
</tr>
<tr>
<td>Political</td>
<td>Thomas, Angus</td>
</tr>
<tr>
<td>2. Educational reasons</td>
<td></td>
</tr>
<tr>
<td>Address specific educational need</td>
<td>Betty, Thomas, Marg</td>
</tr>
<tr>
<td>Make learning experience richer, dynamic</td>
<td>Betty</td>
</tr>
<tr>
<td>Hyperlinking possibilities</td>
<td>Sheryl</td>
</tr>
</tbody>
</table>
Chapter Seven – Findings 1: Individuals’ Reasons for Adoption

<table>
<thead>
<tr>
<th>Reason</th>
<th>Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide students with their own site</td>
<td>Carman</td>
</tr>
<tr>
<td>Enable students to have their individual web pages</td>
<td>Thomas</td>
</tr>
<tr>
<td>3. Communication possibilities</td>
<td></td>
</tr>
<tr>
<td>Communicate with students</td>
<td>Simon, Thomas, Anna, Rose, Samantha, Marg</td>
</tr>
<tr>
<td>Reach off-campus students</td>
<td>Betty, Pete, Thomas, Simon, Anna</td>
</tr>
<tr>
<td>Prepare students for future professional needs</td>
<td>Rose, Thomas</td>
</tr>
<tr>
<td>4. Colleagues’/Network influence</td>
<td></td>
</tr>
<tr>
<td>Influence of and encouragement by colleague</td>
<td>Anna, Patrick, Sally, Louisa, Carman</td>
</tr>
<tr>
<td>Support by peer groups and networks</td>
<td>Carman, Sally, Anna, Simon</td>
</tr>
<tr>
<td>Prior experience with another LMS</td>
<td>Samantha</td>
</tr>
<tr>
<td>5. Administration reasons</td>
<td></td>
</tr>
<tr>
<td>Facilitate administration activities</td>
<td>Ted, Louisa, Angus, Karim</td>
</tr>
<tr>
<td>Make resources available for students who have timetable clashes</td>
<td>Karim</td>
</tr>
<tr>
<td>Facilitate group assignment management</td>
<td>Marg</td>
</tr>
<tr>
<td>Economic advantage of delivering resources free to students</td>
<td>Ben, Stefi</td>
</tr>
<tr>
<td>6. Influenced by research and literature</td>
<td></td>
</tr>
<tr>
<td>Influenced by the literature</td>
<td>Simon</td>
</tr>
<tr>
<td>Area of research</td>
<td>Samantha</td>
</tr>
<tr>
<td>7. Personal reasons</td>
<td></td>
</tr>
<tr>
<td>Personal satisfaction</td>
<td>Patrick, Betty, Pete</td>
</tr>
<tr>
<td>Strategic for one’s career</td>
<td>Stefi</td>
</tr>
</tbody>
</table>
Table 7.5 shows that many participants adopted web-based learning and teaching approaches as a response to top-down authority innovation directives and due to student demand while economic imperatives such as increasing student numbers and political imperatives such as threats of closure of schools were also influential in some instances. Communication opportunities were also a frequent factor in adoption decisions.

The teaching approach described in each participant’s description helps to provide an understanding of that individual’s support needs. Close analysis of the teaching approaches of all study participants could be used to provide an indication of the required faculty staff development needs to formulate a university staff development strategy.

Geoghegan’s (1998) views are consistent with the findings of this study and were also confirmed in a study conducted at Western Michigan University (Spotts & Bowman, 1993) where he described early adopters are risk takers, are more willing to experiment, and are generally self-sufficient and interested in the technology itself. The early majority are more concerned about the teaching and learning problem than the technology and view ease of use, and applications with low risk of failure as critical.

**Rewards**

Positive feedback from students as a result of using web-based approaches featured as an important reward for teaching academics. Hagner’s (2000) views are consistent with the findings of this study. He found that personal satisfaction of a job well done was the only reward for innovation as indicated by most participants in this study. Other rewards mentioned by participants include opinion leadership, professional growth and serving student needs. This idea is further expanded upon in Chapter Eight.

**Summary**

Broadly, the findings indicate that teaching academics in all faculties face significant challenges in their effort to provide effective, efficient, relevant, interesting, learner-centred, web-based learning experiences. Rogers’ adoption attributes can be used to
explain the uneven patterns of adoption and growth when reviewing the way participants used web-based approaches in learning and teaching.

Though the Integrated Theory of Diffusion of Innovation was used in this chapter to describe the motivations of the teaching academics, it has not been versatile enough to describe their interactions with their contexts, and explain the social, political and power relations behind their actions. The issues these teaching academics prioritised and marginalised are also reflective of their individual agendas (Rowan & Knight, 2001) or the politics of the context. The next chapter discusses these issues.

Understanding innovation and change in a higher education setting is not possible without understanding the power and politics related to them. Who and what factors influenced and contributed to the teaching academics’ adoption and use of web-based learning and teaching approaches, and why things happened in particular ways, is explored in Chapter Eight.
Chapter Eight – Findings 2: Influencing and Contributing Actors

Overview

The introduction of a learning management system and other web-based learning strategies in a university changes the way learning and teaching are conducted in that institution. This investigation studied the adoption of web-based learning and teaching approaches by teaching academics at Monash University as an adoption of an innovation. Adopting such approaches is an alternative to established and existing practices as it requires the acceptance of new approaches and new technologies to carry out the familiar activity of teaching and learning.

As explained in Chapter Four, according to actor-network theory, all factors influencing the teaching academics in their adoption of web-based approaches for learning and teaching are considered as actors, and the combination of all these actors is viewed as a network. The human actors (the teaching academics and their motivations) were described in Chapter Seven. Drawing on actor-network theory, the current chapter identifies the non-human actors, describes their active, reactive and resistive properties (Fox, 2002), and examines the networks these actors have with the teaching academics in this study, as well as with each other.

Latour (1991) used the concept of a program of action to examine the definition and distribution of roles and their environment. In asking the question, ‘what were the difficulties and constraints?’, a varied set of responses was received which were both technical and social in that they ‘imply decisions about the definition and distribution of roles between the object and its environment’ (Callon, 1991, p. 137). In this way, a program of action coordinates a network between the human and non-human actors.

Simpson (2000) argued the need for an analytical approach that could address political issues and concerns related to an innovation. The shortcoming in the theory of diffusion
of innovation is that it does not provide for this aspect. This chapter extends understanding related to the politics of introducing an innovation, including what impacts adoption had on a group of teaching academics, and the factors that influenced and contributed to adoption. While the previous chapter examined the perspective of the teaching academics using an Integrated Theory of Diffusion of Innovation, this chapter extends that understanding by describing the related social, political and power-related aspects that influenced adoption, using actor-network theory. This bridges the gaps in the theory of diffusion of innovation and throws light on the dynamics accompanying the innovation, including the contextual factors that influenced the adoption and outcomes of web-based learning and teaching.

Describing the findings through actor-network theory

As explained previously, this investigation was not set up as an actor-network study. Therefore, only those aspects of actor-network theory that help to interpret the findings are used. The five concepts that are used in describing the findings of this study are translation, inscription, alignment, irreversibility and power. These concepts have been selected because they help to explain the adoption of web-based learning and teaching using actor-network terminology.

Translation

Translation occurs through the interaction between actors. Consequently, social and natural worlds progressively take form and lead to situations where some entities control and influence others. Monteiro and Hanseth (1996) claim that an actor’s interests can be translated into technical or social arrangements such as institutional routines. Translation may change with time and is the product of negotiation and compromise, adjusted through iteration (Callon, 1991), extending the traditional definition of action. It includes actors’ efforts to negotiate and align interests, to reinterpret others’ interests to their own (Hanseth & Monteiro, 1998). Understanding these relationships helps to understand and describe the actors and their alliances better.
Chapter Eight – Findings 2: Influencing and Contributing Actors

Inscription

Inscription is described as what ‘various actors in the settings are doing to one another’ (Akrich & Latour, 1992, p. 259). It is ‘the translation of an intention into material form’ (Callon, 1991, p. 143). Material for inscription could be skills, practices, artefacts, institutional arrangements, texts and contracts, which are parts of a network. These are a result of a translation of one’s interests into material form (Callon, 1991).

Inscriptions are interests inscribed into material. Latour (1991) gives an example of hotel managers ensuring that guests return keys at the front desk before leaving: this inscribes the behaviour pattern into the actor network. Studying inscription is relevant because it throws light on which inscriptions were useful to achieve a given aim or specific outcome. Monterio and Hanseth (1996) suggested that there are four aspects to the notion of an inscription:

- what is inscribed;
- who inscribes them;
- how they are inscribed; and
- how powerful the inscriptions are.

Underwood (1998) expresses these four notions as three questions:

- How did it come to turn out this way (explore the changing alliances of actors)?
- Who is influencing it (who has been doing what scripting)?
- Why are some actors acting this way (possible reasons)?

The descriptions of the interactions and alliances of the actors in this chapter are guided by the above questions. They contribute to the depth and detail of the study and present it in its complexity giving due regard to both the human and non-human aspects that influenced and contributed to adopting web-based and teaching approaches by teaching academics. Also influential are the structures and norms of an institution, including high
ranking officers, institutional policy and authority-driven directives which constitute components of the social system.

A translation presupposes an inscription. Therefore, teaching academics in this study make decisions and choices about their use of web-based learning and teaching, their approaches and the extent of the use of those approaches. They adopt or translate according to their requirements and the social, political and power relations related to their situation, and they negotiate use of these within the system. This use is inscribed into the system which formulates a program of action including related roles for all who interact with that system. By inscribing programs of action, all involved humans and non-humans become actors.

Alignment

Alignment is the bringing together of actors for a given performance. The process of translation leads to congruence and agreement between two objects or intermediaries. The extent to which this alignment happens varies. There may be controversy and conflict and the translation may be rejected. A successful translation aligns and links across.

Irreversibility

Irreversibility is the longevity of the connections made by the actors (Callon, 1991). It depends on the extent to which it is impossible to go back and the extent to which it shapes and determines subsequent translations. For a network to be sustainable, the transformation must be stable (Klecuñ, 2004). To be irreversible, change must be durable so that it is impossible to go back. This durability of the translation or its longevity shapes the future, including future processes and future translations.

Power

Latour (1991) explains that all actors have power, and that power is the property of a network. Power exists in others when one exercises it. It is not possessed by any actor until another actor exercises it. When an actor exerts power, other actors respond to or
perform actions. Power is not something possessed or contained and exists only as others perform actions as a consequence (Latour, 1986). Power directs routines and makes enforcements on others (Barnes, 1986).

The following section introduces the actors in this study and discusses each of them. The concepts and conditions of translation, inscription, alignment, irreversibility and power will also be explored.

**The actors in this study**

As explained previously, actors are not only people. In this study, the heterogeneity of the network includes both physical objects such as grant funding and machines, and intangibles (Law, 1992) such as time, policies, workloads, training opportunities, reward structures and professional development. As stated earlier, in this study actor-network theory is only used to interpret the findings without categorising, labelling or giving priority to any of them. It is therefore used here not as a theoretical framework but as a way of describing the findings of qualitative research.

From an actor-network perspective, the teaching academics in this study were also actors and belonged to and conducted their professional activity in the one institution, guided by a single (and therefore common) learning and teaching plan and technology policy. Consequently, they all shared the background and the context within which their experience of adopting web-based teaching took place.

Yet each of them could be argued to have separate actor worlds which are impossible to describe completely as each teaching academic has a very different actor world. The more obvious differences are the individual faculties they belonged to, the differing discipline areas, the specific units they taught, the academic levels at which they taught, and their varying use of technology.

Boundaries to the scope of this case study were described in Chapter Five. In this chapter, actors that are considered to be institutional factors are training courses, policies, training opportunities, funding, reward structures, discipline-based research, professional development and unstable technology. All these are actors in the
heterogeneous network. Table 8.1 provides a complete list of the actors that are considered in this study which form the material for inscriptions. The shaded area indicates organisational factors that influenced and contributed to the teaching academics’ adoption of web-based learning and teaching approaches. It is based on Table 5.4 and the analytical framework described in Chapter Five. This chapter aims to describe how the diverse group of actors listed in the shaded area of Table 8.1 interacts and attempts to achieve harmony and alignment with each other.
The heterogeneous actor network in this study, in reality, is considerably more complex than indicated in Table 8.1 which is an artificial simplification in a two-dimensional space undertaken to facilitate a snapshot list of the elements described in this chapter. In the analysis process, the Nvivo codes generated these headings and the findings are
presented accordingly. The complex interconnections and links are not displayed in the table but are discussed in this section.

There was unanimous agreement from all participants in this study that actors such as time constraints, heavy workloads, the demand for research output, training and policy issues (and at times the lack of policy) impacted on their uptake of web-based learning and teaching approaches. There were other actors such as acknowledgement and reward schemes, unstable technology, threats of school closure and lack of exposure which impacted on some participants only. These will be discussed as they contribute to the rich description of the institution which is the case under study. These actors are now discussed in the order in which they are presented in Table 8.1.

**Time**

Teaching, I have to say, takes a lot of my time. Not only does it take a lot of my time, it’s a bit like gas where it expands, whatever room you put it in, it will expand, whatever time I give it, it’ll just take…. so I have to put very strict limits. – Karim

In adopting web-based learning and teaching approaches, time regulated and made commanding impositions and powerful inscriptions on all teaching academics in this study. They were engaged in an ongoing struggle, or the continuous negotiation in actor-network terms, with time.

Almost every aspect of web-based teaching, from developing learning resources for web environments, to maintaining communication through email and discussion boards, to new work practices related to preparing, moderating and maintaining resources, and learning the new technology, significantly impacted on their time. Agreement was unanimous on this point.

I waste time very effectively! . . . I spend time answering student emails, attending to WebCT postings . . . my teaching duties now eat into my research time. – Pauline

As a consequence of the negotiation and the tension with time, inscriptions were made on the participant actors (the teaching academics) which resulted in all of them working from home at night and during weekends while only two claimed they had specific research days they devoted mostly to their individual research projects. Other
inscriptions they mentioned were strategies such as setting aside planning time, attempts to be time efficient by using feedback proformas, training tutors, looking for funding in order to buy out time release, obtaining assistance from the faculty web manager, blocking out research time, and maintaining all files electronically to facilitate easy copying and pasting. Strategies such as these to manage time were also used by participants in Thompson’s (2004) study and are in keeping with findings by Howell et al (2004) and Hughes et al (1997) who reported that increased demand on time to develop e-learning resources conflicted with their individual discipline-based research.

**Workload**

While teaching with technology added to the workload of teaching academics, their general conscientiousness and sense of responsibility towards their students made them work harder.

> Workloads are too high . . . we academics are complete suckers, we all just work harder and harder and harder and try to deliver quality because we care about our students and we have this conscientious sense and this self respect. – Sheryl

Email communication from students added to the workload.

> The workload is astronomical and just frivolous. I came in today to a full screen of emails. – Ted

Workload associated with teaching with technology was the most pressing issue for all teaching academics in this study. Course maintenance and constant upgrades and improvements made strong inscriptions on time and a minority believed that it was necessary to develop a sustainable strategy to address this. Lone Rangers or individual faculty members who work alone, or at best with a graduate student to create learning resources (Bates, 2000), are dedicated teachers and invest a great deal of time in experimenting with and developing web-based learning resources. Bates (2000) points out that the limitation here is the workload and quality. Lone Rangers do without the support of specialist assistance such as programmers, graphic artists and educational designers, and teaching academics cannot be expected to be experts in all these areas, as well as their discipline area. While the participants in this study were not necessarily Lone Rangers, they were innovators doing pioneering work and sharing many
similarities with each other, such as experimenting with technology-supported learning approaches.

Project management, use of professional support staff, collaborative team teaching, organising online forums and student role playing in discussion forums are some ways suggested by Bates (2000) to control workload. For many teaching academics, including participants in this study, adopting web-based learning and teaching approaches means change, making translations such as learning new skills, and investing more time in preparing learning resources without being certain of the extent to which the learner benefits from them. For workloads to be manageable, there must be alignment with teaching practice. There was evidence among the teaching academics in this study that they were working in teams both with colleagues in their faculties as well as with media production personnel and educational designers. Learning to apply technology where there will be obvious benefit to improve existing situations such as managing large classes was important (for example, see Marg in Chapter Seven).

The administration at times gives us the irates, but by the same token, some of the technology makes the administration and the allocation of prac classes and lectures and all that stuff, a bit easier. And it has to be organised because Monash is a far more complex place than it was even 20 years ago. – Pete

Something that’s really bugging me at the moment to do with ICT is the changed job role of the academic. I’m talking about the admin side of my job . . . academic support of an admin nature, there isn’t any. – Jenny

The administration of the workload can be addressed if this work is reorganised as part of the teaching academics’ overall workload (Bates, 2000) to avoid it being seen as additional or excessive.

While all forms of web enhanced teaching were considered by all study participants to require more preparation time, two participants cited the lack of technical help which made their task harder. Such inscriptions were stressful and generated a feeling of being overloaded which was also a situation identified by Bates (2000).

All participants complained of workloads that made inscriptions of extended work hours.
The hours through which you are expected to work are increased by ICT so you are strongly encouraged to work from home. – Jenny

Two participants (from the Faculty of Education) pointed out that business decisions and the need to operate as a profitable enterprise thrust them into web-based teaching, making little allowance for additional workload and associated pressures that included acquiring skills in the area and developing learning materials without adequate lead times. Teaching academics do not react well when pushed into doing unfamiliar tasks in limited time. This contributes to building hostility and a negative attitude to technology adoption which may have been previously non-existent. All participants in the study referred to workloads as making powerful inscriptions that influence and contribute to the uptake of web-based learning systems for teaching. These findings are in agreement with findings in other studies reviewed in Chapter Three (Ebersole & Vorndam, 2003; McKenzie et al., 2000; Naidu, 2004; Newton, 2003; Spotts & Bowman, 1993; Wilson, 1998).

**Developing learning resources**

Certainly [I] put a lot more time into getting things ready before hand. But that’s a part of distance ed, you do everything before it goes out. – Simon

All twenty-two participants claimed that developing resources for web-based learning and teaching required upfront investment in time, findings confirmed in other studies (Cavanaugh, 2005; Pachnowski & Jurczyk, 2003). The inscriptions on the current study participants can be described as the preparation of materials, such as developing multimedia interactions, exercises, quizzes, online assessments and activities. Time was required for planning and developing pedagogical strategies which was recognised by the following statement:

It's actually an educational design and development [job], we just actually don't have time to do that, and it's not our fault. – Thomas

There was unanimous agreement that materials preparation called for a huge upfront time investment in planning, organising and developing learning resources.

It’s very labour intensive in setting it up and everybody just had to work really hard to do it in the timeframe that we had. With WebCT, you’ve really got to have your material organised. So, that’s an issue for people. – Sally
Preparing more, giving the students I guess more examples, more templates, giving them Word documents, giving them Excel spreadsheets, really killed my time. – Marg

Development of flexible learning options is extraordinarily time consuming and people don’t want to just take it on just as an extra duty when there are simpler ways of getting through their work. – Penny

Developing materials also involved designing and setting up the site, then uploading files such as past examination papers and lecture notes, preparing materials required for tutors and doing web searches for good URLs.

Past exams used to be made available in hard copy by Monash library. Now it’s the academic’s role to upload them to WebCT…. Then there are the ‘student access difficulties’ that seem to come back to me to resolve, or to type numerous email to relevant Helpdesk staff. – Jenny

Amendments to distance ed materials used to be marked up in hard copy for admin staff to type up. Now academics are expected to type the changes. – Jenny

User expectations are inscribed into the technology and servicing these expectations is time consuming.

I used to produce lecture overheads, now they need to have transitions and builds, and they need to have pictures as well, plus they need to be uploaded for student access before the relevant class, plus the versions distributed to students must then have significant ‘value added’ to them within the lecture. – Jenny

While two teaching academics mentioned that writing for the medium was time consuming, one mentioned that designing an integrated package and project managing materials development was a significant and ongoing time commitment.

There were four teaching academics who obtained the assistance of their faculty web manager to set up and upload files. They cited as reasons time constraints and the lack of familiarity to find their way around the software quickly to achieve the task.

The time commitment to develop online resources must also be estimated and predicted.

Deadlines. You have to meet these deadlines. And predictions. You don’t know to predict [how much time will be required]. – Thomas

When developing learning resources, there was much negotiation, compromise and adjustment by all participants (human actors) resulting in inscriptions which would be
ongoing and iterative as the teaching academics developed their skills, processes and understandings related to web-based learning resources.

**Discipline-based research**

Given the huge emphasis on research, research of course determines everything in terms of people’s position within the faculty. – Penny

The power of the inscriptions was such that two teaching academics declared that they would not undertake materials development for web-based learning again. They have both developed complex multimedia resources with grant funding assistance but the experience did not teach them to estimate and project time requirements for any future multimedia projects. Consequently, they would not undertake further similar projects, they said. Two teaching academics were convinced that their PhD work was delayed due to these projects.

One said:

I actually think it was probably a bit of a career set back to take it [developing web-based learning resources] on. I think if I had finished my PhD a year earlier, that would have been much better for my career than spend a year developing these units . . . so, if I had my time again, I wouldn’t have done it, quite frankly . . . I think if I was supervising an employee who was making the choice I made then, I’d be saying, ‘don’t do it’. – Penny

Endorsing this teaching academic’s perspective, Garrison and Anderson (2000, p. 31) agree that acquiring new skills and developing new teaching resources is time consuming and takes time away from ‘more highly rewarding activities’ such as discipline-based research and doctoral work.

I don’t have any time for research. All my PhD is done totally in my spare time and I’m here day to day surviving the actual teaching of a large class. – Rose

With the exception of five participants (a faculty e-learning manager, a course manager, two sessional teaching academics and a teaching academic nearing retirement), who were less interested in maintaining their research output, all of the other seventeen participants complained of their struggle for research time, the tension between teaching and research, and how research suffered at the cost of teaching. Five of these teaching academics had published accounts of their web-based teaching innovations in
conference proceedings, creating further actors or texts and artefacts to influence others. The translations called for continuous negotiation and compromise. Yet the alignment between the actors, time, discipline-based research and developing web-based learning resources was conflicting and controversial. Therefore, the extent of alignment between these actors and the participants (human actors) varied.

**Web-based communication**

Convenience is a factor. It is convenient if they [students] can access it [WebCT] whenever or wherever. It’s inconvenient that they may like a response in less than 24 hours. – Jenny

Ten participants commented that they used discussion boards, and consequently monitored and moderated them in addition to email, while one of them also used the chat facility regularly. One commented:

Monitoring WebCT discussion is also an additional new task, plus overseeing a website that can quickly get out of control with perhaps four different lecturers all having designer access. – Jenny

Consequently, adopting web-based learning and teaching approaches led to new inscriptions such as undertaking new tasks and additional time spent online communicating with students. While the discussion board was useful for students to access staff and fellow students, two participants who were located outside the University and based in a hospital, adopted the discussion board facility to maintain a communications channel with students who were based on-campus. In this instance, the translation was to serve their need as against the students’.

Teaching online widened student cohorts and extended office hours:

What are office hours? I mean these students are overseas and therefore seven hours behind, put that together, office hours doesn't mean anything to us. – Patrick

I get more email queries . . . It’s pretty easy to post something on WebCT any time of the day or night than to come and see me. – Pauline

While nearly all participants in this study found the translation into online interaction via discussion boards a positive learning experience for the students, one participant who taught Counselling believed it was a poor substitute, and email an equally inadequate
way of conveying emotions such as horror, anger and pain. He, therefore, refrained from using discussion boards and used email for work other than teaching. The translation in this instance was not successful as it failed to align and link with the learning needs of the students.

There was unanimous agreement about the inscriptions made by increased quantity of email received and the increased time it accounted for. Except for the faculty web manager, the other twenty-one participants declared that responding to student queries by email was time consuming. Many spent the first few hours of each day responding to student email queries.

You are a slave to email, you can’t get away from it. I’ve tried managing my phone and email messages by saying ‘I do email messages on Monday and I do phone messages the next day and don’t let the two cross over’ but you never keep up with it. You inevitably spend the first hour of the day going through emails and filing them or deleting them or acting on them or whatever. – Simon

Quite often I’m responding 10 or 12 times to the same question, which is not useful for my workload, it’s adding to it. – Stefi

And a lot of people keep saying ‘no time, no time’ and the minute you check your email like at 9 o’clock in the morning, before you know it, you are running around chasing bits or paper or doing little jobs and you are wasting your focus and your energy. – Samantha

Other studies conducted recently (Bender et al., 2004) have confirmed communication, and email in particular, to be demanding on time. Two participants pointed out that the value of email, which required that students articulate their questions in writing, was a useful learning exercise.

If they come in the door . . . they don’t articulate the list of questions very well. Whereas in writing, they have to get it down, but it does mean that sometimes, particularly around exam time, I am answering a lot of student emails. – Stefi

However, there were indications that the teaching academics were developing their strategies to deal with this.

One of the things that I really like about it [email] is that it's not like a telephone interruption, you can see what's there but you don't have to deal with it right now. They don't expect me to respond right now. . . . I simply send a very short reply that says I've received it, I'm thinking about what to say to you; I'm not replying today or look I'm
really tired at the end of the teaching day and . . . I'll reply to you properly tomorrow. – Betty

Other teaching academics attempted to have dedicated days and times to deal with email and student communication. All participants were comfortable using email and although they complained of its volume and the demands on their time, it was also a facility they would not do without.

In actor-network terms, email was making translations in social arrangements and even institutional routines. Though it was considered by all to make inscriptions on their time, there was convergence and alignment as they all accommodated and used it. It had shaped and determined subsequent translations, achieving longevity and clearly demonstrating irreversibility in adoption.

**New work practices**

You become an administrator and a teacher and a multimedia developer and you are a researcher and whatever else that I’ve left out. I’m not very good at it but I know there are wonderful people out there who keep all the balls in the air. – Thomas

The convenience of document sharing through attachments to emails had introduced new work practices and extra demands.

They’ll attach a whole document. Rather than table it at the meeting they’d send it before and expect you to have read it. They can send around these emails with large attachments at 5.30 at night and then have a 9 o’clock meeting and by the time you travel to the campus we are supposed to have read it and informed ourselves. – Jenny

Illustrating the translation in work practices, Evans and Nation (2000) described how the contributing authors to their book, *Changing university teaching*, who were based worldwide, worked on their chapters entirely by email, exchanging attachments and using it to mediate the critical reflection process. In this way technology is enforcing inscriptions on professional operations. While it is a time saver for the sender, this may not always be the case for the recipient. All twenty-two participants in this study admitted to undertaking new roles and adopting new work practices as previously identified by Bates and Poole (2003), Berge (1996), Duke (2002), and Harasim et al (1995).
Unknown factors

It’s difficult because we don’t always appreciate the possibilities that are available because we don’t understand them. Chickens chasing the egg a little bit. You don’t know what you don’t know. You don’t know what it is that you could be asking because you don’t realise the potential, new IT development could be absolutely wonderful but because you haven’t used or haven’t been aware of it, you don’t realise you could put your time into it. – Carman

For wider acceptance, the participant from the Faculty of Art and Design commented on the need for greater understanding related to all aspects of web-based learning and teaching. Staff needed to be convinced of its value, and translation and adoption were delayed as a result. As a participant from the Faculty of Arts pointed out, dealing with the unknown was a barrier:

How do you put a web page together which does this, this and this . . . the possibilities will have to be explored . . . and who knows how the learners will take to it? – Thomas

This participant also expressed difficulty in estimating time when developing web-based learning resources, noting that a task that looked relatively simple took far more time than envisaged. In contrast, the requirements for preparing a lecture were known, familiar and manageable. The inability to estimate requirements accurately when developing web-based learning resources deterred some teaching academics and influenced their decisions on adoption. The unknown factors related to adopting web-based learning and teaching approaches exerted considerable power over the teaching academics. The many ‘unknowns’ voiced by the study participants confirm the claim by Hartman and Truman-Davis (2001) that the process of access-awareness-mastery-application was necessary for the innovation to be adopted and institutionalised.

New learning

I guess like anything you do new, you have to learn the technology. Is that administrative? You have to learn how to communicate with the students in a new way and it is actually time consuming. It’s no different from anything else. – Pete

Comments from ten of the twenty teaching academics reflected a pragmatic approach – adopting something new called for learning or negotiation and adopting a complex learning management system, in particular, required time for experimentation, exploration, observation, trialling and learning.
Chapter Eight – Findings 2: Influencing and Contributing Actors

I had one semester when I played around and learned how to use it and then semester two was when I really started exploring it in a big way. – Samantha

Though web managers based in the faculties offer individual assistance, for this to be effective teaching academics must have the time to take advantage of the assistance, see its relevance to their students’ learning needs, and exercise an effort to implement it to support their learning and teaching approaches.

Sometimes I am offered to them as a resource but they simply don’t have the time to make use of me. (Patrick – web manager)

I quite frankly don’t have the time. I’m so busy getting on and doing my teaching and my research so I don’t have the skills and sadly I don’t have the time to beef up my skills in those areas. – Rose

The new learning must extend to inscriptions such as customisation to individual teaching and learning requirements and gaining the mastery and skills to be able to use web-based technologies confidently with students. The required new learning has been identified by several authors (Andrews & Bowser, 1995; Bates, 2000; McNaught, 2003; Wilson & Stacey, 2004). New learning calls for time investment upfront. Three teaching academics obtained help in setting up their sites because they were pressed for time. Theirs were basic sites containing basic information and minimum interactivity, indicating how time as an actor determined how inscriptions were made and regulated.

One participant commented that the knowledge and skills gained through working with technology would be lost unless one continued to be engaged in similar activities.

New learning is a powerful actor, making strong, and at times irreversible, inscriptions and affecting decisions and choices. Consequently, it shaped and determined the subsequent translations of the teaching academics as actors.

I find that ICT has increased pressure and also expectations. You know, you move a little bit forward in updating and up-skilling and then you have shifted the boundaries and your abilities and you have also shifted expectations as well. – Jenny

**Working with teams**

We really didn’t know when we started. What to ask and how to get help. We didn’t know how to form a team . . . we didn’t know what jobs to take on and how much we could give someone else. – Thomas
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The experience of working in teams to develop web-based learning resources, was unfamiliar for all participants in this study. Good communication, including using specialist terminology when dealing with multimedia developers, was essential and contributed to smooth relationships and alignment with other professionals as actors. All participants believed that, as teaching academics, they should be involved in the development team, and several in hindsight realised that they lacked the skills to operate in a cross-disciplinary team, to articulate requests accurately and clearly, and interact with professionals outside academic circles. The varying experiences and expectations that led to gaps in understanding were at times strongly influential in developing web-based learning resources and adopting web-based learning and teaching approaches. Working in teams called for effective communication, learning to navigate through unfamiliar work processes and operating in new work groups. Successful translation required strong alignment with the skill of working in teams and good communication. It was a useful power to ensure that other actors performed as a consequence.

Network exposure

Valente (1996) explained that social networks influence diffusion through friendship, advice, communication and support. Personal networks are the set of direct ties an individual has with the social system. Since innovations are often uncertain and risky, those undertaking the task of pioneering an innovation generally seek alignment and support from trusted peers and professionals.

I go to research seminars and I talk a lot to Jenny. Actually that taught me a lot. Through my colleagues, you know because some colleagues are concerned about the things I’m concerned with. – Pauline

Six participants who belonged to user groups (in their faculties) and other formal and informal networks drew support and encouragement as well as assistance from them. Two others were considered role models in their respective faculties and influenced other members in those faculties. These networks made strong inscriptions that contributed to experimenting with technology, cross-fertilisation of ideas, problem solving and, in the case of the participants from the Faculty of Medicine, Nursing and Health Sciences, in making further translations through extending the dialogue related to
faculty technology policy. Networks contributed to extending the subsequent translations and increasing the longevity of the connections, thereby making the translation irreversible. In contrast, one participant from the Faculty of Law had no opportunity for such interaction and had no exposure to other colleagues’ sites because there was no time for networking. This lack of exposure was reflected in her attitude as well as her adoption and engagement with web-based learning and teaching approaches. Participants from both the Faculty of Law and the Faculty of Art and Design commented on the absence of technology user groups and networking amongst their faculty staff. The low interest within these two faculties resulted in little discussion about the adoption of web-based learning and teaching approaches.

In this study, participants who had strong social networks demonstrated higher levels of adoption than those who were more isolated.

With the exception of two faculties (Medicine, Nursing and Health Sciences and Business and Economics), the other faculties did not appear to have formal, hierarchical well developed networks or support structures. The difference that these make when they are available is illustrated by the following statement:

We had a rather nice plan on how to adopt it. You know, getting a few people to really understand how it would work and then each to go back to your own unit and then try to get your colleagues to take it up and that was in essence what happened here. . . . so it gradually grows. – Carman

More evident were informal structures and interpersonal networks than the organisational structures that were a part of the institution. The study found that both formal organised networks as well as informal network exposure, were strong influencing and contributing actors which had a powerful impact on all teaching academics.

Acknowledgement and reward schemes

Obviously there is satisfaction in mastering new ways of teaching, in creating new options for students. I certainly got a lot of satisfaction from the very favourable
According to Houseman (1997), the most significant barrier to adopting information technology is not new. He identified the crux of the problem to be the failure of higher education to acknowledge teaching, which is treated as ‘a poor second cousin to research’. Hughes et al (1997) made the same point. Asking ‘What’s in it for me?’ is one of six typical questions Cummings (1996) identified that teaching academics regularly ask when adopting technology in their teaching approaches. Thus, the lack of a reward system was seen to be at the heart of the problem.

It is not a problem created by technology or by web-based learning systems but one that exists and one that requires addressing if teaching academics are to be encouraged to adopt web-based learning and teaching approaches and make their translations irreversible. Houseman believed that the majority of the teaching academics would remain unconvinced about using web-based approaches for learning and teaching unless strategies are used to promote them and managers acquire an improved understanding of the adoption profile of a new initiative. He critiqued diffusion as a passive process and considered that general mainstream teaching academics must be reached and convinced. Allocating funding to specific projects which are then held up as exemplary, does not promote wider acceptance. Instead, he advocated an infusion approach that has all the required software tools and training programs in place with all barriers addressed.

Information technology skills, team work and advanced curriculum design are not commonly rewarded, though teaching excellence is now increasingly being rewarded (Hughes et al., 1997). Almost all the participants agreed with this and pointed out that teaching innovations do not feature in rewards such as promotions, and grants for teaching innovations do not feature as highly as research grants. A rewards scheme cultivates an ‘enabling environment’ for teaching academics to use web-based learning and teaching approaches (Epper, 2001).

Enabling factors at Monash University include the recognition of good teaching through the Vice Chancellor’s annual awards for teaching excellence and funding for innovative teaching through strategic innovation funds. One participant had been the winner of a
teaching excellence award while four had received funding grants for innovation adoption. These are strong influencing and contributing factors, or in actor-network language, powerful inscriptions.

**Policy on intellectual property**

Epper (2001) confirmed teaching academics’ concerns about changes to the traditional teacher roles brought about because of web-based student-centred learning environments. These concerns extend to areas of intellectual property and copyright of materials created by teaching academics. While there are no simple solutions to concerns such as these, they are questions raised by teaching academics in other institutions as well. Resources once online and on a university server, belong to the University. Ownership issues have not been resolved conclusively and since intellectual property issues have not been addressed to both the University’s as well as the teaching academics’ satisfaction, the participants in this study indicated reservations about developing web-based learning materials. This is a situation where there is conflict and uncertainty which deters successful translations that lead to alignment and linking.

**Technology barriers**

Technology uptake is associated with a learning curve. This learning calls for a time investment in order to gain competency and confidence. To adopt a learning management system, the software needs to be learned and the tools mastered, including management of the students through the system. The combination of technical complexity and the time investment required to learn the technology, as well as to revise existing teaching approaches for a web-based environment, was proving to be a significant barrier in the Faculty of Art and Design where no teaching academic had, at the time of conducting this study, adopted the University’s learning management system. This steep learning curve was pointed out by others who also commented that new skills and competencies such as e-moderating, facilitating learning in new environments, exploiting technology advantages and dealing with international student groups via the web, had to be learned. In order to be a competent online teaching academic, one had to have the prior learning and an experience base. An alignment of these is necessary for a
smooth translation that is durable and irreversible. Teaching academics identified these technology barriers as influential in their decisions about teaching online. Technology barriers exerted power over their adoption decisions and affected translation.

Two teaching academics pointed out the lack of prompt technical support, the need to remind and follow up technical staff, and the additional stress generated when technology does not work as it should, as serious deterrents. Technology barriers made negative inscriptions in these teaching academics, and shaped and determined subsequent translations.

Political climate

Engineering in Gippsland was getting fewer and fewer students, we would have had to shut down. By revamping the program and using WebCT we thought we’d be able to widen the access, you know, have more students. – Angus

Three participants (one each from the Faculties of Engineering, Science and Arts) were forced to adopt web-based learning and teaching approaches to boost student numbers and offer their units overseas. The uncertain political climate, the possibility of redundancies and threats of closure were aspects of the work setting that were unconducive and constraining. The political climate exerted strong powers that directed the routines of these teaching academics and made enforcements.

Attitudes

In the Faculty of Art and Design, the University’s newly adopted learning management system was not considered ‘a hot topic or a show-stopper’ and it ‘was not going to make them [teaching academics] famous’. Staff were unconvinced that it would improve their teaching in any significant way. In actor-network terms, the translation of these attitudes resulted in inscriptions that took the form of the learning management system not being used in this faculty (at the time of this study).

The attitude was not dissimilar in the Faculty of Arts where the learning management system was considered ‘a plaything’. There was no overt resistance to it but the general passivity made inscriptions in the form of barriers to adoption.
Developing flexible learning options is extraordinarily time consuming and people don’t want to take it on just as an extra duty when there are simpler ways of getting through their work. – Penny

One participant from the Faculty of Law (one of two faculties that had so far not adopted the University’s learning management system), was of the opinion that online learning was inferior to face-to-face approaches: it did not add value to learning and it increased the teaching academic’s workload. There was concern among a few participants about unauthorised persons accessing their material on a server. One participant had received negative advice about using discussion forums. These inscriptions are not motivating or encouraging and are unhelpful in bringing together and aligning actors. The other eight faculties had active user groups, greater faculty-wide uptake of web-based learning and teaching approaches, and a more open attitude to online technologies which consequently demonstrated a more successful translation that aligns and makes links.

**Unstable technology**

Like most innovators and pioneers, two participants from the School of Nursing in the Faculty of Medicine, Nursing and Health Sciences experienced unstable and unreliable technology. Technology was not centrally supported at the very early stages (prior to the University adopting WebCT® as its centrally supported LMS), and teaching academics were frustrated with breakdowns, anxious students and stressful situations. As Geoghegan (1998) pointed out, only innovators and pioneers have the energy and motivation to work without the central support of the university. Robust technology is necessary to win the confidence of both the teaching academics and the students, while unstable technology, particularly in situations of technology adoption, makes very strong negative inscriptions. Prompt and reliable technical support is necessary when technology is part of the mainstream. The lack of it was a cause of frustration for participants in the Faculties of Education and Law. Good, stable technology has the tendency to make translations durable and shape future translations as well. It is therefore a strong influencing and contributing factor.
IT skills and support

Two participants acknowledged that their lack of IT skills resulted in their inability to keep pace with their peers. This deficiency was felt even though they were participating in user groups as well as policy discussion groups. Some faculties such as Medicine, Nursing and Health Sciences and Business and Economics had strong and visible IT units that provided assistance as required and on demand. In general, faculty IT support was a strong contributing and enabling factor to adopting web-based learning and teaching approaches, again prompting durable and stable translations that affect future translations as well as shape the future, contributing to the irreversibility of that adoption.

Funding

We got grant aid for development. But will we get grant aid every year for every semester? . . . that financial issue has come back because we don’t know how the new budgetary arrangement is going to be. And what we do, you know, will depend on it. – Thomas

There was constant pressure in every faculty to do more with less. A majority of the participants cited lack of funding support as impacting on decisions they made related to adopting web-based learning and teaching approaches. An injection of funding had the power to give a boost and make a innovation happen. Funding as an actor clearly impacted on other actors as well as put boundaries on adoption and made direct inscriptions on time. Four fortunate participants had received external funding for their projects and made translations such as buying out their time from their regular teaching tasks to work on developing web-based learning resources and accessing professional assistance such as educational designers, multimedia developers and graphic artists. For the others, funding was not available.

The possibilities are seductive, it’s almost as if we are being teased – Don

The general belief was that adopting web-based teaching and learning approaches was prohibitively costly. While funding influenced and controlled most teaching activities in all faculties, small units on rural campuses experienced severe budgetary constraints which made strong inscriptions on the uptake of web-based approaches.
Policy

Policy forms part of the politics of introducing an innovation and is the most common form of inscription in a large organisation. There is a body of literature that highlights the importance of strong, supporting institutional policies to promote the wider uptake of technology adoption (Collis & Moonen, 2001; Daniel, 1997; Rowley & Sherman, 2001). Effective and supportive policies are necessary to make adoption of web-based learning and teaching approaches feasible. Policies are actors that form a part of the organisational support structures that contribute to adoption.

Management’s control interest are inscribed into policy documents such as the Learning and Teaching Plan (Monash University, 2003c) which includes the objective of, and strategies for, monitoring developments and continuously reviewing the progress, quality and learning outcomes of technology supported learning, thus operationalising the University’s strategic direction in this area (Monash University, 2002b). Supporting this is the Educational Technology policy (Monash University, 2002a), advocating the use of the widest possible range of approaches and techniques to encourage teaching academics to become involved in the use of educational technology and providing the direction for implementation, infrastructure maintenance and enhancement of income from faculty educational technology resources. Complementing the Educational Technology policy, the Effective Teaching and Learning policy states that effective teaching at Monash must be ‘innovative in responding to the opportunities offered by new technology while recognising that technology must serve educational objectives, not drive them’ (Monash University, 2003a).

Inscribed in these policies is Monash University’s control of interests such as productivity statements and standards, its external image, competitive strategies and teaching and learning approaches, including technology adoption. These control interests are translated into a larger heterogeneous actor network. The Teaching and Learning Plan (Monash University, 2003c) is such a translation. Similar translations are training workshops which enable teaching academics to use the learning management system, induction programs, mentoring schemes for all new teaching academics, the mandated qualification for professional development in tertiary teaching (the Graduate Certificate
in Higher Education) and the appointment of Associate Deans (Teaching) in each faculty to take responsibility for the enhancement of teaching and learning in their faculties and implementing related policies.

Monteiro and Hanseth (1996, p. 339) cautioned of the shortcoming in using actor-network theory to explore how policy makes inscriptions on teaching academics because it is unable to account for all aspects: ‘It cannot properly deal with institutions: how they shape actions at the same time as the very same actions shape the institutions . . .’

Despite the existence of strong policies related to learning and teaching and technology at Monash University, the uptake of technology for teaching was dependent on the adoption of the learning management system and web-based learning and teaching approaches at the faculty and individual teacher level facilitated through the policies of the respective faculties. The inscriptions articulated by these interrelated policies may seem strong, non negotiable and fixed at the institution level, but the findings indicate otherwise. The policies at faculty level were less strongly inscribed than the policies at institution level, thus leaving room for a great deal of interpretive flexibility at the faculty level and at the individual teaching academic level. This was a result of the institution’s policies being negotiated and interpreted by individual faculty policies.

They provide the machines and the software and basically leave it up to the academics to take it from there. In some respects they like to do that, you know we have this thing called ‘academic freedom’ you can teach how you want to teach – Jenny

There is great interpretive flexibility because of the distance between the followers and those who formulated the policy (the teaching academics and the senior administrators).

**Gaps in policy**

Bates (2000) pointed out that individuals adapt to technology faster than institutions, which explains why faculty policies lag behind. Participants from all faculties concurred that policy in each of their faculties was still being formulated.

Policy tends to be catching up to where we're at. So sometimes you're left in the dark. . . . we're kind of making it on the run. – Betty
Participants pointed out that there was no clear policy in areas such as off-shore delivery, student anonymity in discussion forums, individual teaching academics’ quota of units online, teacher workload, crediting work, copyright and intellectual property and team-teaching using a single website.

I haven't seen anything in the University yet that addresses very fully the implications of privacy legislation in the way that we conduct discussion groups. To some extent the students become highly visible, highly identifiable and quite vulnerable to external scrutiny . . . We don't have protocol about how to deal with that. – Betty

We're still working out the policies about how we register digitised reading materials and who holds the registered copy. – Betty

Participants from the Faculty of Medicine, Nursing and Health Sciences pointed out the absence of policy to deal with student abuse of discussion boards.

They actually said we’ll make a proposal that there’d be a disclaimer on a discussion group to say that the students agreed to certain conditions before they participated . . . And that, to this day, has never happened. – Sally

All participants from this faculty, as well as the participants from the Faculty of Education and Victorian College of Pharmacy (Faculty of Pharmacy) pointed out that there were policies needed to credit the online work of teaching academics appropriately, and safeguard their intellectual property.

I suppose the intellectual property because this is such a movable thing like, from one week to the next, you could change your material constantly, so I think that’s probably an uncharted area. – Sally

However, they also acknowledged that solutions were soon dated as keeping pace with change was not easy.

I think it all moves so fast that by the time you think you have answers to a problem, that problem is an old problem and it’s no longer a problem. There is a new problem. – Karim

Policy related to web presence

The Faculty of Education policy made inscriptions of a compulsory minimum web presence in every unit. However, the extent and dimensions of that ‘minimum web presence’ were open to interpretation.
The only thing on the web is a little site that [the webmaster] does, which I asked him to put on for me. So if any number-cruncher is checking out on who does and doesn’t have a website, at least I have a lousy little website. – Rose

Other faculties did not overtly have a mandatory minimum web presence policy.

A majority of faculties had a very open, not very specific policy about adopting web-based learning and teaching approaches as did the Faculties of Engineering, Information Technology and Arts. Participants reported that in the Faculty of Business and Economics:

You can have all the technology and you can have no technology. You can stand up and deliver a one sided treaty on law if you wanted to, waking up the students in the end . . . they leave it up to you. – Jenny

The Faculty of Science was no different.

I don’t know that we even have such a policy, that we should be developing information technology resources. If we do it’s probably just paraphrasing University policy. – Sheryl

Two faculties, the Faculty of Law and the Faculty of Art and Design, had not adopted the University’s learning management system at the time this study was conducted. The Faculty of Law adopted InterLearn instead of WebCT.

The decision was made not to go with WebCT because the faculty argued that they were not familiar with WebCT and that we could get all the functionality we needed for that particular course without using it. – Penny

The Faculty of Art and Design had no strategy and therefore no policy imperative.

Certainly, getting our staff on to WebCT, it’s not a priority. It may exist if at all as a priority C - one of those nice things to have but not a business imperative. It’s not mission critical. – Don

As a result, the University’s learning management system had so far not been adopted in this faculty and the faculty did not offer any web-based learning, though a few teaching academics had placed their learning resources on the faculty server for students to access.

Though policies exist at institutional level, there is distance and interpretive flexibility between policy makers and the faculty-based teaching academics.
Policy and teacher support

With the exception of the participants from the Faculty of Law, all participants felt that the faculty policies on the use of web-based approaches to carry out learning and teaching did not adequately support the teaching academic and that there was little alignment with the teacher’s needs.

I do not think the policies cater adequately for grass roots-level support and particularly for support systems or admin support that will enable sustainable online delivery resources. – Jenny

In the Faculty of Law, developing web-based learning resources was generally considered as

[a] special project either funded by the faculty or funded by grants with time out. Nobody can be expected to do it on top of their teaching load. I think that is the faculty’s attitude. They don’t expect people to come up with these flexible learning enhancements off their own bat . . . – Penny

Developing such resources was considered an extra in the Faculty of Law and to engage in such activity was the teaching academic’s choice (as was the case with Stefi). The two participants from the Faculty of Law, however, pointed out that providing funding and allocating time for developing web-based learning resources was an ‘unwritten’ policy in that faculty only, and that this unwritten policy had shaped translations in that faculty in the recent past.

A Faculty of Education participant commented:

The problem with these policies is that it looks good on paper and they just don’t think through how it’s going to be done practically. They make the policy and then they haven’t visualised how it is actually going to happen in the lower levels. – Rose

The participants from the Faculty of Science did not believe there was leadership or initiative from the faculty regarding supporting staff to adopt web-based learning systems. There was no support financially and no time granted to develop technology resources.

Giving us time, that would mean money, they don’t give money. – Sheryl
The three participants did not have much expectation from the faculty and were cynical about support.

One participant pointed out the danger of policy making inscriptions that favour some, particularly the tech-savvy teaching academic, instead of moving everyone forward and directing resources to help all, and promote the wider uptake of web-based learning systems.

There is no point putting lots of money into the boundary-pushers because they’ll just be pushing the boundaries further and further away unless you bring the majority of people along with you. You have to put money and time into making sure you bring other people along with the boundary-pushers as well. Everyone else will still be back where they were. So the whole mass has to move too. Because ultimately it’s about the wider take up and not just about boundary-pushers. – Samantha

A participant from the Faculty of Education pointed out that there was no established procedure or policy regarding confidentiality, who makes changes to another's web pages, or what changes are allowed. The lack of alignment here was found by one participant to be deprofessionalising, leading to tensions and conflicts because policy had some catching up to do with the adoption of web-based learning and teaching approaches. Without this alignment, successful translations were difficult and were threatened by conflict.

Apart from the Faculty of Law, the other nine faculties were grappling with the extra workload resulting from adopting web-based learning and teaching. While the Faculty of Law gave time release to develop web-based resources and extra loading to teach online, the other faculties had no such scheme and made no such inscriptions.

Nobody is keen to take on the development of flexible learning options or enhancements unless there’s funds for it and time in lieu and all that sort of thing. So people aren’t interested in it unless they are actually involved or they’ve got a grant. – Penny

Determining time and workload could only be supported through policy.

We have all the tools. We have all the computing horse power that we need. So that’s not an issue. In terms of getting people extra time because they are developing something in multimedia over and above something that’s more conventional, no there’s no respect for that. – Don
To make this translation successful, other actors were brought in to ensure longevity and irreversibility and these actors were able to shape the future, including future translations. All faculties appointed Associate Deans (Teaching) who were responsible for learning and teaching in their respective faculty including enabling web-based learning and teaching. While all faculties hired their own IT support personnel, faculties such as Medicine, Nursing and Health Sciences, Law, and Business and Economics had established Flexible Learning Units to provide pedagogical support and one-to-one assistance to teaching academics who were developing web-based learning materials. As highlighted by Geoghegan (1998), the lack of support in the area of providing educational design and pedagogical support that should accompany e-learning technology adoption is particularly acute. Providing this support was viewed as a strong contributing factor to adoption as pointed out by one participant who referred to the value of an educational designer:

... sitting down with me and saying ‘what are your teaching objectives, what is it that you want the students to be able to do, what functionality do you want’. – Penny

While these interactions promoted individual staff members’ awareness of technological possibilities in web-based teaching and learning, the Flexible Learning Unit in the Faculty of Law was too busy and understaffed to make a wide impact.

Yet some teaching academics felt that participation and involvement in the adoption of new learning and teaching approaches was very necessary.

You’ve got to be involved in a process in the Faculty or the School or the Department, how to offer a particular teaching mode. – Penny

The view of some teaching academics was that adopting web-based learning and teaching approaches was not the best practice. A website limited only to the students was not the best learning environment, and a regressive step from the open access site the Indonesian language learners previously had, and therefore, the practice of using the University’s LMS prevented learners from interacting with native language users which reduced the learning impact.

According to the comments of the participants, none of the faculties demonstrated a strong, strategic technology plan nor a plan for adopting web-based learning and
teaching. Participants could not identify policies at University or faculty level that inscribed career paths, work guidelines, workloads and limits to online components. It is important to recognise that these elements interact together to form an actor network which inscribes the responses and behaviours of the teaching academics. Ideally, each faculty should have a technology plan that sits within a wider University plan (Monash University, 2005c) but this was not the case. There was no policy, nor a clear definition of the balance between face-to-face and web-based teaching. Sherry et al (2000) have shown that consistent strategies are helpful in providing a structure and direction to adoption of educational technologies. An influencing and contributing factor could include new organisational endeavours to achieve increased productivity, competitiveness and flexibility, which are rational institutional arrangements to meet changing requirements (Monteiro & Hanseth, 1996).

The University policies allowed the individual faculties the freedom to apply the policies as they saw fit. While these policies were enabling and encouraging in a broad way, it was not the role of the University policy to comment on implementation such as how teaching academics’ workloads could be better managed by giving time release.

Though funding opportunities were available through strategic innovation fund grants, these were few and mostly awarded to those who worked at the cutting edge rather than to those who were engaged in regular mainstream work.

**Training and professional development**

If the faculty is really serious, it’s got to allow time for people to beef up their skills. – Rose

Complementary professional development promotes and facilitates staff adoption of innovations, by supporting new ways of teaching and encouraging reorganisation of work practices. It makes translations easier and encourages further translations. At Monash University, learning management system training was offered centrally through regular workshops that provided technical training on the use of its tools.

Depending on the stage of implementation that staff are at, the factors that facilitate adoption vary. Sherry et al (2000) confirmed that the type of professional development
and training required varied according to how comfortable teaching academics were with the innovation. With increasing comfort, onsite support became less important than online support. Curriculum integration with the technology was harder at first, while acquiring technical skills became important when long term decisions were being made on whether to adopt or not.

The findings of this study were similar. Staff needed timely training in a range of areas when they were ready to receive it. Two participants (Faculty of Business and Economics and Faculty of Information Technology) indicated training requirements in team teaching for those based in various locations, using the one website. A majority of participants indicated training needs in e-moderating as well as in developing a pedagogical understanding about resources required for the web environment and managing international students. One showed concern at the lack of training available at a basic level in contrast to a more advanced level.

Predictably, technical training did not feature as a requirement for a participant from the Faculty of Information Technology though there was consensus among this faculty group with regard to the need for training related to developing web-based resources in a pedagogically appropriate way. Central services that provide the training are not visible enough for teaching academics to reach out to for help. While some faculties, such as Business and Economics and Medicine, Nursing and Health Sciences, had their own training workshops, this was not the case with other faculties. Consequently, training opportunities staff could access were uneven across the University, though the training offered by the central services was available to all. Staff, however, had to opt in for this.

Training and appropriate professional development makes web-based learning and teaching approaches seem relevant and applicable, and consequently increases their value for the user. This irreversibility is referred to as ‘lock-in’ (Monteiro & Hanseth, 1996). Certainly, training had this effect on the participants of this study.

**Websites**

In an object oriented context, each website of each participant actor can be considered as a separate actor with its own properties, methods and design (Tatnall, 2003). However,
each teaching academic’s approach was described in the previous chapter as part of the individual participant’s description and key features of the websites were covered then. Consequently while recognising its position as a separate actor, websites will not be discussed in this chapter.

**Summary**

Monteiro & Hanseth (1996) critiqued the inability of actor-network theory to deal properly with institutions, and described how actors shape actions as well as concurrently describe how the actors shape the institution. This chapter has not attempted to describe how institutions shape actions or to describe how actors shape institutions. Rather, it has identified major actor networks in this case study and described how each of them interconnect and interact through translation, alignment and inscription, and exert irreversibility and power.

Tatnall and Burgess (2004) critiqued actor-network theory for not clearly defining the boundaries of a given network and for not being clear about which account of a network has to be taken as definitive. However, this study has its boundaries in that it is limited to the boundaries of the case (Monash University). Actor-network theory in this chapter has provided an approach to study an innovation where people and machines are involved, leading to an account of current events while not attempting to predict the future. The analysis of the contextual conditions through actors has provided pointers to the conditions that may be successful or not successful in the introduction of an innovation.

The next chapter discusses the findings of this chapter and the previous chapter, and considers their implications for the future.
Chapter Nine  Discussion

Introduction

Web-based learning and teaching approaches and specifically the use of the learning management system, are on the rise at Monash University though the voluntary use of these approaches is far from widespread. The investigation found that though teaching academics in this study adopted web-based learning and teaching, not all of them were enthusiastic about this modality. They were often sceptical about the real learning value of web-based approaches, or resentful because of the time needed to develop and use web-based learning resources. The findings reported in Chapters Seven and Eight indicated that adoption of web-based learning and teaching was influenced by a range of factors, and that many adoption reasons were not related to improving learning and teaching. Institutional context including procedures, departmental climate and ethos, and initiatives and incentives aimed at improving productivity, play a commanding role in adoption decisions. This indicated that senior managers and those in leadership positions can facilitate a climate that is encouraging and conducive to adoption, such as making innovation compatible with current work practices by allocating time and resources.

Science and technology, as well as technology adoption as explored in this study, are products of interaction between many diverse actors. The findings of the study on the whole were about every-day, ‘coal-face’ teaching academics’ approaches to web-based learning and teaching and consequently provide an evaluative comment and a perspective on their perceptions and understanding of the university context, including the supportive frameworks within the University and within their individual faculties. The findings extend on the observation by Callon (1991, p. 132) that ‘... standard models of technological development are flawed. Technology rarely grows in a predictable and unilinear manner within a relatively stable social and industrial context’. The ensuing discussion in this chapter voices the teaching academics’ stand rather than that of the management or the institution. This chapter discusses the main findings of the study under the following five key headings:
The findings of this study have demonstrated that contextual factors have played a significant role in adoption and combine theory with practitioners’ experience and local contextual knowledge to create a new understanding of the adoption of web-based learning and teaching at Monash University. They concur with the Collis 4E model (Collis & Moonen, 2001) that identified environmental factors, effectiveness, ease of use and engagement as predicting the likelihood of the adoption of telecommunication information technology related innovations. Understanding innovation and change in a higher education setting is not possible without understanding the power and politics related to them. It is significant that many in this study adopted web-based learning and teaching approaches as a response to top-down authority innovation directives. While student demand for web-based learning led teaching academics to respond by providing such learning opportunities, faculty politics as in the case of needing to boost student numbers to avoid school closure, and funding grants also played a powerful role in stimulating adoption among some participants in this study.

Teaching academics saw opportunities in web-based teaching to improve learning as well as communication, but they were also pressured and challenged to think and act in new ways in response to technology and its implications for pedagogy. They had limited time, limited help and limited space to think about changes to teaching and implications for pedagogy related to technology use, few models of good practice to follow, inadequate technical support and unclear policy to direct their work. Despite these constraints and difficulties, the power relations behind their actions must be recognised,
acknowledged and understood. The issues they prioritised and marginalised were also reflective of their individual agendas, the politics of their faculties and the particular stage of their careers they had reached.

Many teaching academics in this study had gone through stages of learning the technology, adopting it and working with it, and some of them had gone on to assist and build capacity among fellow colleagues, giving presentations, sharing experiences, serving on technology planning committees and becoming peer trainers. While these teaching academics evolved and grew in competency and confidence, the University evolved and grew with them. Their networks expanded and other colleagues followed, and the study demonstrated how some of them progressed to being leaders. Though on a small scale, this demonstrates acceptance of web-based learning and teaching as it happens from within, through individuals in faculties. These individuals were less likely to transform their teaching to an entirely web-based virtual approach but were more likely to have a blended, mixed mode model that incorporated aspects of the web via the learning management system, as well as using textbooks, readings, CD ROMs and classroom sessions and each of them developed an individualistic model of adoption. In short, there was much information communication technology in use that did not replace traditional on-campus teaching but complemented it by using it in a blended model with other media as well as with lectures and books.

The current study found that participants were influenced by the context, including authority innovation directives in their departments/faculties, problems such as threats of school closure resulting in the need to boost student numbers, and other institutional reasons. Some faculties were better resourced and were therefore able to provide their teaching academics with support such as web developers and technical assistance. As each participant experienced these influences differently and in varying combinations and with varying degrees of pressure, their adoption was highly individualistic. The result was a blended/hybrid, individualistic approach combining web-based approaches with CD ROMs, video, audio, lectures, textbooks and tutorials as appropriate to each individual teaching academic’s student cohort and the learning need of that cohort. The
study showed that adoption was highly individualistic and a common University wide adoption model or template did not exist.

**Supporting organisational infrastructure and policy framework**

While Monash University has its vision statements, the study found that they were broad and limited in their specificity, and consequently limited in their meaning and relevance to the individual teaching academic. The implementation of new technology in learning and teaching is only possible if systems within the University adjust, with a vision to do things that were not done previously. It is evident from the findings in this investigation that the existing organisational structure would need to be reviewed and revised (with such a vision in focus) at individual, group, faculty and institutional level.

Technology adoption in universities is unlikely to happen successfully unless strong and enabling organisational infrastructure and supporting frameworks are in place and are managed by those with vision and leadership. According to Morrison (2003, p. 112) ‘The vision needs to be compelling. Doing the same thing better isn’t enough. The vision should present a picture of doing what you’ve never been able to do before.’

Indeed, Bates (1997a, 1997b) suggested twelve organisational strategies and listed them to provide a vision of how teaching should take place. These included: supportive funding; strategies to include technology enthusiasts as well as the mainstream; supportive technology infrastructure; technical, media and pedagogical support; increased student access; new teaching models that exploit the technology; staff training and reward structures; project management; new organisational structures that support new kinds of work; and inter and intra university collaboration. The findings of this study confirm such a strategy and suggest a need for pre-determined goals, prescribed roles, an authority structure and rules and regulations at institutional level if teaching academics are to feel encouraged to adopt web-based learning and teaching approaches. Since pre-determined goals cannot always be provided, an environment that accommodates experimentation and risk-taking would be encouraging to those teaching academics who are comfortable with such an approach. Supportive and strong structures are necessary for governing a large institution. While these regulatory structures in a
broad sense were present, they were of value only as far as they cascaded down from the
top organisational level and articulated into faculty goals, rules, regulations, and then
further to assist the faculty-based teaching academic. For this to happen, there is a need
for a second level (a faculty level) set of goals and policies which all members of that
faculty are either aware of or know how and where to access them. These would act as
guidelines to provide teaching academics with direction in their teaching activity but
they would need to be formally established as policy.

Organisational goals and regulations need to be viewed by faculty-based teaching
academics as relevant to them in their roles and duties. Regulations and policies need to
provide answers to their questions (e.g., on issues related to intellectual property on the
web). Teaching academics are easily disillusioned if this does not happen, and feel
uncertain, unprotected and insecure. An extensive and explicit policy framework which
provides relative security for teaching academics to work within, and guidelines to help
teams operate and make decisions, is needed. Evidence from the study suggests that
without this, they will do the basic minimum and will not be innovative.

It is also clear from the study that once the institution has decided to adopt web-based
technologies for teaching, implementation does not happen smoothly across the entire
organisation and involves many groups of people, including teaching academics, who
both champion as well as oppose them. Drawing all these groups into a policy-related
conversation would be useful to obtain a more comprehensive understanding of the
thinking of teaching academics University-wide. Such a policy debate would be best
moderated, guided and supported centrally. At Monash University, a centrally located
unit such as the Centre for Learning and Teaching Support (CeLTS) could be given the
carriage and leadership for testing new ideas related to innovations and policy. Policy
should not be viewed only as managerial leadership providing guidance and pathways.
While policy addresses direction, sets boundaries to protect individuals and sets the
general intended outcomes and acceptable solutions, teaching academics need to take
responsibility for and participate in developing those policies as they are aware of policy
gaps they encounter when they come to perform certain functions. Therefore, they need
to be involved in proposing and formulating policy, and become critics and analysts of
those policies as well as implementing them in their practice, and contributing to
refining them. Unless they become active in these roles, policy will be top-down and
one-way which often makes teaching academics resentful and frustrated. According to
the findings of this study, those participants who were members of user groups and
active users of technology were involved in discussions related to policies for their
faculties that they believed would be useful to guide their own practice. The findings
also indicated that a few participants were resentful of the top-down directives to adopt
teaching with technology. Therefore, the collegial and participatory experience of
involvement in the guiding and steering function of policy, and sharing the responsibility
for those policy structures and their outcomes, provides an incentive to innovation
adoption.

It is best that teaching academics most likely to be innovators and users of technology
should be involved in formulating faculty policies related to teaching with technology.
However, to achieve a balance and to hear all possible problems, difficulties and
reservations, low-users and non-users must also be involved in the dialogue and policy
making procedures. While conversations are important and dialogue is useful, policy
should be supportive as against being deterministic and must be a strong framework that
operates at both micro and macro levels. The current study exposed the absence of
policy in five key areas related to workload and time, intellectual property, recruiting
teaching academics, funding and rewards and consequently had a negative impact on
adoption. These are discussed below.

The lack of policy in relation to *workload and staff time* was a current pressing problem
in all faculties. The findings of the study indicated that there was a huge impact on time
and increased workload as a consequence of adopting web-based learning and teaching
and that it was obvious that there were no policies related to both time and workload, let
alone a clearly defined strategy to accommodate work associated with teaching both on-
campus and off-campus. The study results showed that issues related to workload and
time need to be considered in relation to the multi-campus international nature of
Monash University’s operations if a supporting institutional infrastructure and policy
framework is to be constructed.
This suggests that the full nature and the impact of workload involved in teaching across multiple campuses and multiple time zones needs to be explored further. Balancing work and time is part of this issue, including exploring all the related functions of teaching (such as administration) that contribute to workload and time. The responsibilities and liabilities of teaching in a global classroom include developing web-based resources of different levels of complexity and associated workload, moderating discussion groups, managing online assessments, and workload in relation to student numbers, and in relation to student levels such as first-year undergraduates versus postgraduates, are some areas that need closer consideration and debate leading to policy formulation. The lack of a policy framework in this area can lead to a nightmare of overwork and a lack of support for teaching academics. Most of the participants in this study raised these concerns about workload and time pressures.

The study suggested that policies related to intellectual property need to be clarified. Some teaching academics in this study were not keen to be creative or go to the trouble of creating learning resources because they believed they did not receive adequate credit for this. They also knew that they would not be able to use those resources in another institution if they were to move out of Monash University. Results suggested that ownership must be determined and defined, and that policy related to teaching academics’ materials on a university website needs to be clear so that protection of learning materials is not the only goal, and sharing and reuse of them is accommodated. Therefore, structures that will encourage the use of materials prepared elsewhere, if they suit objectives and reciprocal arrangements for sharing, need to be a part of the dialogue.

A good starting point in this area would be to develop an understanding of the current legal and policy context related to intellectual property at Monash University. Requirements of the institution and the individual teaching academics and the eventual use by students must be considered, and the rights management at each level must be mapped. Digital content management is an emerging area, and investigating whether teaching academics need help in understanding and managing intellectual property related to digital content, and putting in place relevant staff development in the area, will pre-empt problems and misunderstandings for both teaching academics and the
institution. It would be helpful if such information is made available in a simple and easy-to-understand format (for example, as a list of frequently asked questions) and easily accessible on the faculty or University website. Staff need quick answers as against lengthy explanations on what is legally possible or not. Such information will have to be constantly monitored for currency and value for users. Copyright, intellectual property issues, plagiarism, data protection and other e-legal risks have proved to be problems for teaching academics. Bell and Bell (2005) confirm that institutional level policies that address issues, present best practice and audit risks are important and support teaching academics in their technology adoption challenges. The findings of this study confirmed this important need.

The results suggest that when recruiting new staff, defining the importance of teaching innovation and demonstrating how excellence in teaching is valued by the management, are important to promote teaching with technology. It must be made clear at the outset that teaching face-to-face or online are all a part of teaching, and excellence in teaching is valued as much as excellence in research. Such an approach will be assisted by well marketed faculty and university reward schemes to credit excellence, if these schemes are visible and achievable to all staff, including new staff.

Funding grants awarded to four teaching academics encouraged them to explore the potential of web-based learning and teaching and create innovative learning resources. Their websites were complex hybrids consisting of streaming video and audio, and custom made tools embedded on their LMS sites. This is in stark contrast to the sites of several others which were developed in response to top-down authority innovation directives, and only included unit outlines, calendar, email and links to additional resources.

The study revealed that adoption was greatest when funding was made available, time to develop web-based learning resources allocated, and the task credited as part of the workload. The consequence of this was that recipients of funding grants integrated web-based approaches into their teaching earlier than others, were more convinced of the value of the resources they developed, were more confident about integrating web-based learning systems into learning and teaching, and rated them as compatible with the unit
and the curriculum they taught. The innovation adoption process when supported by funding allocations, occurred with greater ease and satisfaction. An award of a funding grant (of whatever size) is a sign of recognition of the extra effort required to develop resources. The study results showed that funding grants coupled with top-down directives also promoted adoption, but top-down authority directives alone are often in danger of being resented by teaching academics, and the adoption not wholehearted.

The findings of this study showed that the teaching academics valued *rewards and incentives* including practices and systems that acknowledge and reward involvement and achievement related to collaboration and teaching using web-based learning resources. Rewards stimulate adoption and contribute to job satisfaction but as Collis and van der Wende (Collis & van der Wende, 2002, p. 63) found, teaching academics were ‘stretching the mould’, doing more, but with no reward. The current study identified a similar problem where teaching academics had moved ahead but institutional policy related to rewards lagged behind in some areas. Although the institution offered an annual Vice Chancellor’s ward for excellence in teaching (won by one of the study participants) which provided recognition and reward for exemplary teaching, there was no organised structure to relate reward to tenure, time release, research time or even conference participation, all of which may be seen as valuable rewards for teaching academics.

How an institution measures and evaluates teaching academics’ initiatives in adopting and using learning technologies is difficult to measure, yet if rewards are involved, it is necessary to evaluate work in digital scholarship and develop processes and standards for such scholarship. Rewards can be defined in terms of promotions, bonuses, travel and research stipends, laboratory and office space, laboratory equipment, reduced teaching load and time to develop resources. Ideally, an institutional effort (or a national effort) to recognise technology-enhanced teaching should be implemented. For example, websites with peer reviewed learning technology efforts such as MERLOT (Multimedia Educational Resource for Learning and Online Teaching) [www.merlot.org](http://www.merlot.org), an open resource designed for teaching academics in higher education consisting of annotated peer reviews and links to resources, credit teaching effort in a way similar to crediting
research and would be useful to support promotions and tenure. This would also contribute to elevating the status of teaching which most study participants complained was valued less than discipline-based research.

Policy and guidance in these areas would provide teaching academics with more direction and would clarify expectations related to teaching academics’ investments in time and effort.

Unless issues related to workload and time, intellectual property, funding, rewards and other organisational infrastructures and policy frameworks are resolved, it will be difficult to find a suitable organisational model that ensures quality as well as makes teaching academics comfortable, able and skilled online teachers.

**New work practices**

The current study found that changes to familiar work practices can be confusing to some teaching academics, but must happen if they are to feel comfortable with new learning and teaching approaches. Collis and Moonen (2001, p. 153) called for an ‘instructor engagement strategy’ that enabled and promoted technology use among teaching academics in the university. Such a strategy would support teaching academics in planning for the redesign of their units and courses, provide relevant training and enable them to become a part of the culture of change. A similar strategy may provide a solution to the issue identified in the Monash University study and some of these new work practices such as working in teams, communicating with professionals outside one’s discipline, ongoing maintenance to websites, ongoing learning and staff development and employing technology to be efficient are discussed below.

While previously teaching academics themselves prepared and wrote print based learning resources, use of technology requires them to *work in teams* and draw on professional skills and understandings of faculty web developers and other professionals. Developing elaborate multimedia learning resources may lead to collaborations with others outside the faculty. Such collaborative teams may include professionals such as graphic artists, programmers, interface designers, multimedia developers, video and
audio production experts, animation specialists, simulation experts, web developers and others. In order to produce good multimedia learning resources successfully, teaching academics need to rely on, as well as know enough to draw on, the professional skills of all these persons. Developing learning resources collaboratively with large teams of varied professionals is an unfamiliar and complex new work practice as pointed out by some participants in this study. Providing support in the planning and redesign of their units and courses to exploit the advantages of new technologies would contribute to developing a better understanding of the required work practices.

A related complexity encountered by several teaching academics in this study was the need to communicate with professionals outside one’s discipline. Building complex learning resources called for assistance from professionals such as web developers, audio and video producers, simulation experts, graphic artists and others, and teaching academics needed to provide these professionals with clear and precise instructions on what each would design and build in to contribute to one learning resource or object. Instructions to each specialist must be different in order to draw on that specialist’s skill in a way that contributes to the project. The possible lack of ‘specialist speak’ in some teaching academics inhibits their ability to communicate clearly and describe and request a learning tool possibly no one in the team has seen before (see Thomas in Chapter Seven). This makes the task harder and the expectation unrealistic, but is a skill teaching academics need to acquire.

Most web-based learning materials call for ongoing updating and maintenance which is a new work practice for most teaching academics. The work is not complete as it once was after the lecture was delivered and the book has gone into print. At a minimum, links need to be checked and updated or new links offered when new information becomes available. Maintenance and updating are a necessary and ongoing work practice, contributing to the workload about which all study participants expressed concern. This will indeed be a growing work area in the future and as each individual teaching academic is responsible for their resources and the currency of those resources, they will also have to make it a part of their regular work to manage that currency.
Teaching academics also need to be reconciled to ongoing learning and staff development as part of their new work practice, and that they will be left behind unless they regularly participate in it. While they come to grips with the value of technology to facilitate their teaching, they will need to concurrently develop skills in using technology in a pedagogically appropriate way. Many study participants developed their web-based learning resources iteratively, demonstrating ongoing learning and gradual skills development. As technology keeps changing, the related pedagogical approaches must also evolve, and it is possible that a new version of previously used software could require rethinking of the pedagogical approach. This makes teaching academics’ learning and skills-updating a continuous part of their work, making boundaries between work and learning less clear.

The study findings showed that networking with colleagues and informal user groups was a beneficial work practice. Extending this to cross-faculty networking among teaching academics and the development of communities among them contributes to building a supportive work environment. This is also a useful avenue for finding out about the availability of learning objects and current practices of colleagues. Teaching academics are often used to working within their disciplines and in their faculty groupings but active, and especially cross-faculty networking proved to be a useful and rewarding work practice (see Angus and Pete in Chapter Seven), and well worth promoting.

Since all study participants were concerned about escalating workloads, they have to seek opportunities to reduce work such as employing technology to be efficient and experiment with work practices that are new to them such as team teaching to share or reduce load and responsibility. Though online team teaching may be a new work practice to many, it will be useful to explore its value and work out strategies to operate in teams.

Teaching academics need to adapt to and experiment with techniques of working electronically and as technology advances, they will need to evolve work practices accordingly. Some study participants demonstrated such efforts by developing electronic
feedback forms for assignments and bulletin boards for communicating general information.

**Staff development**

Investment in new technology must come with supporting staff development and it is the responsibility of the institution to support, expand and expose all staff to new knowledge. This study revealed that Monash University provided this exposure. The responses of the participants indicated that they availed themselves of the centrally provided staff development opportunities as well as training initiatives and programs offered within each individual faculty. These were mostly in the area of becoming familiar with and using the learning management system (Weaver et al 2002; Weaver & Nair, 2004) which was useful in facilitating and enabling adoption.

This investigation revealed that staff development is a major need in several areas and needs to go beyond the ‘the driving lesson approach’ (Bell & Bell, 2005, p. 652). By using Rogers’ (2003) perceived attributes which are technology related, the current study drew on teaching academics’ technology-related adoption motivations which provided a starting point for evaluating technology-related professional development requirements and formulating new opportunities.

The study suggested that teaching academics needed to be able to work together with others within the faculty, as well as to collaborate with those from other faculties. They also needed to be able to collaborate with central services such as CeLTS, Information Technology Services (ITS), and the library and know what services they provide in order to request help when it was needed. Examination of the participants’ websites and teaching approaches indicated that training in team-teaching using the one website, in e-moderating, managing an online class, organising online group work and understanding copyright law on the internet were necessary. Training in gaining efficiencies through the use of technology to reduce work such as using the MyFiles area and other file management techniques, version control, using the administration functions of the technology to conduct and administer the class, managing marks, student groups and
email, integrating student queries with FAQs, discussion forum use, and use of the calendar would all be helpful.

The study indicated that information related to copyright needs to be clear to teaching academics and that they need ongoing staff development in the area as the laws evolve and change. To ensure that staff development occurs on these legal issues, faculties must have procedures and policies related to updating in a constantly changing field. A University website addressing frequently asked questions related to copyright and intellectual property would be a useful and supporting resource for teaching academics. Such a site could be the responsibility of the University’s copyright officer who could also be available for discussion and advice, and contribute to staff development in that area.

Two participants in this study (Jenny and Marg) used a report writing tool that was built by the University’s multimedia experts and customised and modified to suit the requirements of the two sets of learners. This demonstrated that teaching academics would gain if they were assisted into a culture of sharing learning objects and resources through a University repository of learning objects and resources which enabled them to browse, select, modify and customise. Clearly stated enabling and supporting regulations would promote such activity before new resources are produced. Academic management could facilitate access to an institutional database of learning materials and evaluation plans and provide the opportunity for teachers and course teams to build on existing knowledge through funding, as well as travel to extend collaboration, as part of staff development (or as part of rewards).

Staff development should be linked to scholarship by providing Library support, not just in teaching, but also in professional development by finding areas where teaching academics’ own work related to teaching with technology might be published.

The accounts of the twenty-two participants in this study indicated that they would all benefit from staff development in a range of areas. Overall, what was needed was the establishment of an ongoing program of staff development that raised awareness of current teaching practice, learning approaches, quality assurance issues, developing
awareness, expectations, and a critical approach to technology, learning designs and formative evaluation approaches. These will increase confidence and competencies of teaching academics and in turn increase possibilities of them making their own contribution to the field. In order to achieve strong staff development, efforts must be connected to performance management schemes which provide recognition for the teaching academics’ development. The link to institutional objectives and strategy must be clear in the staff development. Teaching academics need proven guideposts to help them know where they are going and guidelines to follow, in order to get there. An holistic approach to staff development is needed in contrast to an isolated technology only approach which also ensures the long term sustainability of the innovation that extends beyond the initial implementation period. In short, staff need to be supported in their work and assisted in designing learning environments which will enhance student learning.

It is valuable to recognise and promote debate continually at an institutional level to identify key areas for professional development and to also provide a forum for teaching academics to discuss ideas and experiences on media based teaching, future requirements for technological development (providing the opportunity for free dialogue and exploration of ideas), and share awareness of current developments in design.

**Being adaptive**

Higher education institutions, systems and the people who work in them need to be ‘robustly adaptive’ (Laurillard, 2002, p. 214), as was emphasised in this study.

Web-based teaching calls for commitment and passion. It calls for being flexible and patient when the technology fails, being innovative to exploit the technology, seeking help from others when necessary, networking with colleagues and being adaptive. All participants in this study demonstrated these characteristics.

While acknowledging that the demands on the teaching academics were significant, they have to learn, respond to the environment and respond to internal changes and possibly, a hostile environment. Being adaptive and flexible was crucial to their learning and
survival in a changing world. This is well complemented by continuous staff
development and participation in an institution-wide technology adoption dialogue.

While the institution undergoes re-engineering, individual teaching academics need to
re-engineer their teaching, and adapt their pedagogy accordingly. For example, all
teaching academics in this study, even those who had basic websites to satisfy faculty
requirements, viewed the ability to use hypertext/hypermedia links within a document
and between documents as a major advantage and incorporated the feature extensively
on their sites. The feature gives learners additional paths to follow (though not
interactive because there is no feedback related to the user’s actions and nor does the
information change as a result of the user’s actions). Nevertheless, it is an iterative first
step and an adaptive approach to adopting web-based learning and teaching which may
eventually lead to the appropriate hybrid suitable for the learning group.

If teachers are to continue with their tasks of contributing to knowledge and making the
best use of the technology, University support to adapt to the changing environment is
necessary. The university must be an adaptive organisation that learns from experience,
and experiences of other similar organisations, to evolve and grow. Monash University
has clearly identified its roles and priorities on web-based learning and teaching through
its strategic plan. What it now needs to do is to consolidate the learning accumulated
through past experiences of adoption (including those of their own teaching academics)
of web-based approaches and develop a sustainable resources and financial strategy
(which accommodates technical and instructional support) that will support high quality
web-based teaching. Such a strategy that has adapted and learned from past experience
(if it is well thought out and has vision) would provide for an enabling, encouraging and
accommodating environment for teaching academics. In addition to learning from
individual efforts from within, Monash University must be informed by the activities
and experiences related to technology adoption of the entire higher education
community. No doubt it is a competitive environment, but it is also a learning
environment and therefore of value.

Concurrently, mechanisms that are capable of monitoring, learning and changing in
order to maintain quality must be in place. The adaptive, evolving university is a
competitive, modern, dynamic organisation. It will need to be a continuous dynamic process of iterative change that makes the organisation an evolving, living, growing university that is responding and learning from the changes and pressures of the world outside.

**Summary**

The findings described in Chapters Seven and Eight were discussed in this chapter under five key headings. While these findings make it evident that web-based learning and teaching is a part of Monash University’s landscape, it also points out that the University needs a modernised, well integrated and more extensive e-strategy which encompasses not only its learning and teaching but also student services, financial services and staff services.

Web-based learning and teaching brings with it its related power and politics. The current chapter further described the demands it makes on supporting infrastructures and policy frameworks within the institution. The chapter described how web-based learning and teaching imposes new work practices on teaching academics who adopt it requiring professional development in facilitating learning through technologies, and a willingness to work with change. The chapter also pointed out the need for individual teaching academics, departments, faculties and the University to be more systematic, innovative and adaptive in all areas of work, administration and communication.
Chapter Ten  Conclusions

Introduction

This dissertation has reported on an investigation of the adoption of web-based learning and teaching approaches by a group of Monash University teaching academics distributed across its ten faculties. The study revealed that web-based learning and teaching approaches were adopted for a range of reasons. These included improvement of learning, drawing on technological advantages, and reasons relating to power and politics within the context of the University. The investigation was an effort to engage with practitioners and arrive at practitioner-generated knowledge of a local situation because ‘[o]ne strategy for closing the theory and practice gap is practitioner-based research’ (Hubbard & Ottoson, 1997, p. 41).

The study has provided some issues to consider when developing a rationale and a framework for innovation diffusion, to facilitate wider acceptance of web-based learning and teaching among teaching academics at Monash University. This chapter summarises the findings of the study and relates them to the key research questions.

Summary of the study

This investigation was a case study conducted at Monash University to study the adoption of web-based learning and teaching by teaching academics. Using purposive sampling, responses were obtained from twenty-two selected participants in ten faculties from the University’s Victorian campuses.

The analysis of the data used Rogers’ theory of diffusion of innovation, specifically in relation to the perceived attributes of an innovation, to highlight teaching academics’ technology-related adoption motivations. Since their adoption motivations extended beyond technology-related reasons, the study also drew on actor-network theory to interpret teaching academics’ social, political and power related motivations. This
enabled the portrayal of a more holistic picture of teaching academics’ adoption motivations in the given context.

**What was learned from this research and its implications**

The major findings of the study relate back to the study questions and are summarised below according to these. The main study question was –

**What influenced the decision to adopt web-based learning and teaching approaches?**

The response to this question is considered together with the response to the four related sub-questions:

1. **How did the context influence the decision to adopt?**

The investigation showed that some teaching academics adopted web-based learning and teaching voluntarily while for others adoption was a top-down directive. In either case, teaching academics in all the faculties were keen to provide effective, efficient, relevant, interesting learner-centred web-based learning experiences. However, these were not the only reasons that influenced and stimulated the adoption.

For many, the technology itself was of interest and provided reasons for adoption as web-based learning and teaching approaches offered a relative advantage over what they replaced. Some teaching academics found the use of web-based approaches compatible with their existing values, practices and previous experiences and they considered them easy to understand, learn and use. Consequently, these web-based approaches gave the opportunity to experiment, trial, reduce uncertainty, and learn by doing, prior to adopting. In addition, it was possible to emulate work on LMS sites through observing colleagues’ adoption results. However, adoption motivations extended still further than technology-related reasons.

Institutional reasons included top-down authority innovation directives, receipt of funding grants, student demand, and the need to boost student numbers because of threats of school closure. A strong adoption stimulus was an ‘authority innovation-
directive’ made by people in positions of power which teaching academics as employees had to comply with.

Teaching academics’ adoption efforts were influenced by pedagogical reasons such as the ability to address specific learning needs, make learning experiences richer and more dynamic, provide hyperlinking possibilities, and provide students with their own sites and their own web pages.

Web-based learning opportunities were attractive to teaching academics for their communication possibilities. Since they provided a practical method of keeping in touch with off-campus learners, as well as supporting and maintaining contact with learners while they served their professional placements as they moved around Australia (and worldwide), these factors greatly influenced some adoption decisions. However, some found web-based teaching hugely time consuming, and this therefore negatively influenced some adoption decisions.

Some teaching academics had more supportive and encouraging contexts. They were influenced and encouraged by colleagues’ work and were supported by peer networks in their faculties. A minority also had previous experience with other learning management systems which established their confidence in web-based learning and teaching and influenced their adoption decisions.

Administrative advantages such as the convenience of group assignment management or making resources available when there were timetable clashes, and an economic advantage of delivering resources free (allowing students to download at their own cost), also influenced adoption decisions.

While a minority of participants was influenced by the research literature, pedagogy related to the web was one person’s area of research. A few teaching academics admitted to the uptake of web-based learning and teaching approaches for their personal satisfaction, and one did it for personal strategic reasons as well.

All participants were greatly influenced by workload and time issues. While developing web-based learning and teaching resources was time consuming, course maintenance,
communication and discussion group moderation extended their workloads and strongly influenced technology uptake decisions. This demand on teaching time had a negative effect on discipline-based research because teaching academics viewed it as compromising a career priority.

Enabling factors such as rewards and recognition, grant funding and time release to develop complex resources were strongly influential in adoption decisions. Those who received grant funding and time release from regular teaching adopted easily, were more convinced about their adoption decisions, and had in general integrated the learning resources to result in a blended learning environment, if not a web-enhanced learning environment.

Technology uptake is also associated with a sharp learning curve. Time and effort must be invested up front prior to using technology for learning and teaching and the availability of strong, prompt, reliable technical support positively influenced adoption. Participants who came from those faculties that had prominent and easy access to technical support were more comfortable with technology use.

Complementary staff development that went beyond operating the technology and included pedagogical aspects related to learning and teaching with web-based approaches strongly encouraged and facilitated adoption. However, this was an iterative second step that followed the first efforts of making the technology work.

The study identified that a strong and overarching influencing factor on adoption was policy. A university policy that articulates into a faculty policy which in turn gives direction and defines web presence of a given unit, workloads of teaching academics related to developing e-learning resources and teaching online, time related to teaching and research, ownership and intellectual property of learning resources developed by teaching academics was considered necessary guidance. Such a faculty policy which aligns with teaching needs as supported by an institutional vision, is strongly influential in the take up of technology. Supporting policy also provides a safe environment for teaching academics to function, experiment and be innovative in. Such a policy structure was not obvious in the context that was studied.
2. What learning and teaching approaches do teaching academics use?

The investigation found that the teaching academics use a range of web-based learning and teaching approaches. A majority of them (except for three participants who used InterLearn) used the University’s adopted corporate learning management system (WebCT®), though their sites varied in complexity of use. While most sites used email extensively for communication, the sites were also used to deliver information. This was done by making available on the site handouts in Word files and presentations in PowerPoint files. These were comfortable and familiar tools for the participant teaching academics. Though extensively used on all sites, the learning value of these was low since they did not contribute to making those sites interactive, or facilitate feedback related to users’ actions (though there was a demand for these from the students). Word and PowerPoint files and email were the most familiar technology used by all teaching academics and represented the baseline at which all teaching academics began adopting web based learning and teaching approaches.

Many teaching academics also provided hyperlinks within documents or lists of useful hyperlinks, directing and guiding learners to relevant information and consequently encouraging them to seek information. For all study participants, hyperlinking was a new approach made possible by adopting web-based approaches.

While discussion forums were used by a few, multimedia, simulations, custom made streaming video and audio, and CD ROM based resources were used much less and were, in fact, developed only by those who received funding grants.

No participant in this study offered their unit entirely online using only the web. They had developed their unit into blended hybrids as suitable to the learning needs of the student cohorts. Each teaching academic’s website gave a good indication of how resources in that site were used and structured, and the extent to which they integrated with, supported or complemented the main classroom session or other off-campus learning resources, thus demonstrating the learning and teaching approaches adopted. Consequently, these websites gave an indication of where the teaching academic was in the process of technology adoption and whether they were using the site as an add-on, an
enhancement or as a blended approach to support their students. The participants who had blended approaches in their sites, also facilitated a community of inquiry through their teacher presence in their discussion forum. All participants used traditional lectures, textbooks, tutorials and laboratory sessions which were usually the core teaching approach. A few participants used a largely unintegrated set of web-based resources as an enhancement to support and complement their dominant teaching approach. A similar number of participants had static add-on sites. While the blended approaches adopted offered greater flexibility to learners, they also demonstrated the highly individualistic nature of teaching academics’ adoption.

This analysis of websites also provides useful baseline information for planning appropriate staff development to match the needs of teaching academics.

3. What conditions stabilised the adoption of web-based learning and teaching?

Strong, relevant staff development contributes to stabilising adoption. As the study demonstrated, the centrally provided staff development opportunities were technology focussed and consequently made the technology more accessible. Though this is a useful start, staff development that extends further and relates to pedagogy and how the technology can be used to serve a learning need further stabilises adoption. However, the study participants’ staff development did not include this aspect.

An enabling environment contributes to stabilising the adoption of web-based learning and teaching. This was seen in some faculties (e.g., Medicine, Nursing and Health Sciences) that had user groups and other formal and informal networks, including specialist technical assistance. Technical assistance, in particular, coupled with staff development, contributed significantly to developing teaching academics’ confidence in and comfort with web-based learning and teaching approaches.

Student demand was also important to stabilising adoption. Students who had experienced the use of the learning management system in some units requested that it be used in other units as well. For the teaching academics, adopting the learning management system made sense if their colleagues who offered units belonging to the same course of study also adopted web-based learning and teaching approaches. Student
demand, coupled with colleagues’ adoption, confirmed and stabilised their own adoption.

Adoption was also stabilised when the web-based approach directly responded to an existing learning problem and linked to a real learning need or at least a practical need such as the need to maintain contact with and support the medical students who moved around on placements.

Funding grants were a strong factor in stabilising adoption. Grant money made it possible to create more complex multimedia, streaming video and audio, and CD ROM resources, with the assistance of multimedia specialists and other professionals. It enabled teaching academics to draw on the services of educational designers to embed and integrate those resources in pedagogically appropriate ways. These initiatives introduced technology and significantly changed teaching academics’ learning and teaching beliefs and approaches and contributed to stabilising the adoption. Funding grants of any size also had the effect of confirming recognition of the task, and thus validating it.

Providing time release to develop web-based resources, also a form of recognition of teaching academics’ work, was important in stabilising adoption. Recognition also extended to rewards such as awards as was evident from the experience of the participant who was a joint recipient of a Vice Chancellor’s team-based educational development award. Recognition and rewards, however small, such as new software or conference participation money, contributed to stabilising adoption.

The few participants who evaluated their technology developments and presented at conferences, joined a community of elite practitioners, linking teaching and research. Scholarly publications about teaching academics’ innovation adoption experiences were also a strong factor in stabilising adoption.
4. What can be learned about strategies necessary to implement web-based learning and teaching?

The study demonstrated that though the institution decided to adopt the LMS, the implementation does not happen directly or smoothly across the organisation. Implementation involves the institution, the faculty, department and the individual, all working together.

A supporting institutional infrastructure and policy framework which provides a vision of what must be achieved as well as guiding structures and procedures within which to operate, is necessary. The study found that such a strategy was in place at Monash University. However, supporting and complementary policies that articulate into individual faculty goals and are meaningful to individual teaching academics addressing issues such as workload, intellectual property, rewards, funding and performance management, also need to exist.

Staff development played a significant role in supporting implementation of web-based learning and teaching. While training courses in operating the technology were useful, staff development that encompassed technology and pedagogy was more useful in integrating web-based approaches with learning and teaching practices.

Implementation involves individual teachers who both champion and oppose the use of web-based learning and teaching approaches, and therefore it is necessary to understand the problems and barriers faced by all groups of teaching academics in a large multi-campus dual-mode university while developing an enabling environment. Such an environment assists and supports change in work practices, facilitates networking, rewards excellence in web-based learning and teaching, gives time to improve practice in the area, and provides opportunities for research into teaching.

Significance of the results

The practitioner-based research in this investigation has produced local, contextually enmeshed knowledge that has highlighted areas that need to be addressed to facilitate the adoption of web-based learning and teaching, as well as highlighting the need ‘to move
the innovation across conceptual boundaries by generalising and systematising ideas’ (Hubbard & Ottoson, 1997, p. 52). While adoption of web-based learning and teaching was happening in some areas of the University, it was clearly not happening evenly across the entire University.

The findings of this investigation are of significance to the institution where the study took place as they reveal how Monash University teaching academics take to learning and teaching with web-based technologies. The context-specific nature of the findings is useful for reassessing and finetuning the institutional and faculty technology policies as well as staff development approaches. An information snapshot such as this, obtained periodically, would be a useful stocktaking measure, especially for a large organisation such as Monash University.

The results of this investigation are important for exploring the gap between potential and actual use in the real setting, and are relevant to the following:

1. Individuals at Monash University in leadership positions such as administrators, deans and department heads could be informed by this study of conditions that facilitate adoption. These individuals have decision making powers and often drive institutional policy. The investigation yields current information on technology adoption, incentives and barriers, preferred methods of learning about technology, and the extent of adoption. This is information, gathered from the grass-roots level, is useful to inform decisions and policies formulated by those in leadership positions. Specifically, the study outcomes could be used to inform decisions about training, support, resource needs, policy gaps and the need for new processes and new thinking in relation to quantifying work related to web-based learning and teaching.

2. Individual teaching academics at Monash University who are interested in further adoption of web-based approaches for learning and teaching, as well as those who are potential adopters need an understanding of the contextual factors that could influence technology adoption and use. This would give them an insight into the complex world of using technology for teaching and learning, the
different expertise requirements, and the new demands related to developing and using web-based learning and teaching.

3. Researchers who wish to build on the current study can draw from the understandings arrived at here. Empirical studies in this area are not very common, and studies such as the current one provide a good starting point for those researchers who wish to follow an empirical approach.

4. The findings could be of use to other higher education institutions adopting e-learning. Though generalising findings of this study to other institutions was not a key study objective, these findings would be of relevance to other large multi-campus higher education institutions who wish to consider experiences in similar institutions.

5. The study could also be of use in the wider academic community to others studying technology diffusion in higher education settings. Whether they consider enabling factors, barriers, adopters themselves or institutional policies and politics, this study provides a current profile of an Australian higher education institution and Monash University’s experience of tackling technology adoption.

**Recommendations for further study**

While conducting and reporting on this study, other questions arose which were beyond the scope of the study and therefore not pursued. These are listed below and they could form the basis for further studies in the area.

- The notion of community – how do communities of adopters support each other and how could the interactions and energies within those communities be used to drive innovation as well as be useful to other mainstream teaching academics?

- Policy, policy makers and policy formulation mechanisms – what policies are necessary in relation to web-based learning and teaching and who is involved in policy making processes and mechanisms?
- Research into groups of excellent teaching academics who do not adopt technology for learning and teaching – what are the reasons and perspectives of teaching academics who did not adopt web-based learning and teaching approaches? How can such information facilitate comparison between the adopter groups described in this study and help in tailoring more inclusive staff development programs for all?

- Conduct longitudinal observations of this same group – what do longitudinal studies conducted in depth regarding adoption stability, networking influence and leadership reveal?

- Develop a catalogue of (a) what lessons were learned of positive and negative experiences; (b) what obstacles are still to be overcome, as well as an analysis of obstacles followed by strategies to overcome them; and (c) what the staff development needs are. This last item, in contrast to the others listed above, has a practical focus.
Elective 1 - Online learning and the evolving role of the educational designer: Voices of the educational designers
Background and justification

The transition to online education is challenging familiar work patterns, processes, roles, (including boundaries of roles and functions), working groups and approaches to work. This study arises out of the researcher’s own experiences, reflections and responses to those changes occurring within the Educational Design Group (EDG) at Monash University.

Concerns that led to the study

The convergence of traditional distance education and face-to-face teaching as a consequence of the impact of information communication technologies, changing student demographics, economic rationalisation and globalisation is well documented (Bates, 1997a, 1997b; Collis & Moonen, 2001; King & Kenworthy, 1999; Tait, 1999) and was explored in Chapter Three. The consequence of this convergence is the blurring of boundaries between off-campus and on-campus modes of learning and teaching and the adoption of more ‘flexible’ approaches. Having to develop off-campus distance learning resources is a significant innovation for teaching academics (Meacham, 1982). Similarly, the use of online technologies is relatively new to many of them. The professional development they have received in teaching at a distance, in making materials more flexible, in developing materials for multimedia and hypermedia environments and working online is, often minimal. Short workshops can introduce concepts but they provide inadequate training for the complex work involved in the development of such material or for facilitating learning via a learning management system. These circumstances have given rise to an extended role for educational designers in terms of the advice and assistance they provide, their operations and project
management. This elective, therefore, sets out to explore those areas of the practice of educational designers that have evolved and expanded as a result of the use of web-based technologies for learning and teaching.

**Terms used in this study**

Educational design takes place within an organisational context (Murphy & Taylor, 1993; Schwier, Campbell, & Kenny, 2004) and the characteristics of that organisation in terms of its policies, politics, attitudes and relationship to technological change and its employees contribute to its unique context. While the Monash University context was described previously in Chapter Six, unique characteristics related to this study include:

- its multi-campus, international organisation;
- the availability of educational design as a central service provided by staff located at two of the eight campuses; and
- the need for educational designers to collaborate with teaching academics dispersed across the state, country and overseas.

The terms used in this study are those used in the context within which this investigation was conducted, and because these terms are context-specific, they are outlined below.

**Educational designer** –

Most higher education institutions involved in off-campus and flexible modes of delivery employ staff referred to variously as ‘instructional designers’, ‘educational designers’, ‘educational developers’, ‘education officers’, ‘educational technologists’ or ‘programme development officers’, among others, though the term ‘instructional designer’ is probably the most widely used. Since this investigation was carried out at Monash University where the title ‘educational designer’ is used, this study will refer to the position as ‘educational designer’.
Centre for Learning and Teaching Support (CeLTS) –

CeLTS is a central unit within Monash University that deals with flexible learning operations University-wide. The Educational Design Group (EDG), located within CeLTS, services these operations through the design and development of learning resources. At the time of this study, the EDG consisted of four educational designers who assisted teaching academics across all eight campuses.

Educational design and CeLTS –

At Monash University, the approach to educational design is varied. It is not mandatory for flexible learning units to have formal educational design and therefore many teaching academics choose not to use the service, opting to do their own educational design and use the CeLTS services for printing/duplicating, dispatch and delivery, and multimedia and video/audio production functions only.

Defining and redefining the role

Establishing instructional design as a profession has been fraught with obstacles (Murphy, 1994, p. 146) and an intelligent one-line answer is hard to give when someone asks ‘And what exactly do you do?’ The lack of a clear statement on ‘what it is that we [instructional designers] do well’ (Andresen, 1991, p. 5) and the domain or field of expertise that is covered, in contrast to the role definition of other professionals, is an issue often discussed.

A resulting extensive and lively debate in the literature in the 1990s analysed the role and practice of educational designers, a majority of this from those within the profession reflecting on their work (Andresen, 1991; Merrill, Drake, Lacy, & Pratt, 1996; Murphy & Taylor, 1993; Nation & Walker, 1993; Osborne, 1997; Parer, 1993; Ryan, 1995). This discussion related to the educational designer who worked on developing print materials for distance learners. The role of the educational designer was seen as facilitation of the learning process by structuring materials, establishing objectives and relating them to competencies; acting as surrogate student who also assists in providing ideas, critique and comments, designing learning activities and creating learning pathways, while also
editing, checking content and readability; acting as the communication specialist who makes decisions related to appropriate forms of communication such as combining text and graphics to facilitate learning; acting as a team member who works in partnership with teaching academics to create a set of learning resources while administering, coordinating and managing the learning materials production process; and participating as an academic involved in scholarship and research and contributing to knowledge in the area.

Two studies, one conducted at the University of Tasmania (UoT) (Roberts, Jackson, Osborne, & Somers Vine, 1994) and a second, challenged and inspired by the former, at Central Queensland University (CQU) (Macpherson & Smith, 1998), defined the role of the educational designer as perceived by neophytes and experienced teaching academics, chiefly in relation to print materials in an off-campus, distance education environment.

Allen (1996) studied 99 educational designers in Australia and profiled their qualifications and activities, investigating the perceptions others have of educational designers while questions of occupational identity continued to be explored by others (Andresen, 1995, 1996).

With the advent of each new technology in the higher education arena, educational designers (particularly those coming from a distance education background rather than an educational technology background), have had to extend what they do. Parer (1993, p. 12) observed that ‘the advent of desktop publishing has modified the role’ and called for educational designers’ expertise to extend to advice on instruction and textual design. Ryan (1995) flagged ‘a further skills requirement’ as a result of developments in communication technologies and as distance education approaches were translated to on-campus settings, though no identification was made of those skills. At present there is a good understanding of the educational designer’s role in developing print-based distance learning materials. With online technologies increasingly being used in teaching and learning, the support and assistance provided by educational designers is very different from that of the past. While work contexts have changed, approaches to work processes and patterns of work in relation to those changed work contexts have also undergone changes.
As the role evolved through the 1990s, the question of occupational identity also evolved. ‘What do learning technologists do?’ was raised again in an exploratory study conducted in the UK (Oliver, 2002). The study concluded that collaboration was a key part of the role along with additional administrative, research, management, and technical functions, together with being educative. The study also pointed out that the role had responsibility but no authority (over those learning technologists they worked with).

Today educational designers deal with media other than print, and as Hughes et al (1997) pointed out, many educational designers are no longer text writers and editors as in the early days of distance education but now work across a range of technologies. They stressed that the design of educational processes is now much more prominent in educational designers’ work. Educational designers no longer design learning resources that are delivered via a single delivery mode but work across online, print and face-to-face delivery and work together with web developers, and academic developers, further blurring roles between these groups (Bird, 2004).

Collis and Moonen (2001, p. 108) found that technology adoption in higher education institutions imposed new roles, not only on teaching academics and students, but also on ‘those professionals who assist the instructors in the design of their courses’. They recognised a shift from the content transmission model where the course is a product that is delivered to learners, to learning designs that are activity-based and learner-centred, using a range of media, including World Wide Web environments which involve the participation of learners.

Schwier, Campbell and Kenny (2004) studied the work and the role of instructional designers in Canada and researched their professional identities, communities of practice and their roles as social change agents in their institutions. They found that professional roles and identities were ill defined and dependent on the institutional culture.

Identity is an important part of any community of practice as it embraces a sense of shared purpose. A successful community needs to have boundaries that define its recognised focus. Sometimes the moniker ‘instructional designer’ is adopted by an organisation before that identity is defined, as organisations create the positions and anoint employees with the label. We speculated that people create identities from their
experience and background, and in professional communities they draw on institutional culture, professional literature, professional organisations and reflection to understand the boundaries of their practice (Schwier et al., 2004, p. 77).

Bird (2004) conducted an Australia-wide study including all 38 universities, filling a gap in much needed empirical literature on the changing work environment of educational designers and found that the variance in the conditions and awards under which educational designers are employed added to the confusion regarding their roles. Like Schwier et al (2004), Bird (2004) reported that educational designers’ roles were not well defined. Her study also revealed that the activities educational designers engaged in most were designing teaching and learning activities, staff development for online teaching and learning, designing for online learning environments, staff development in the area of developing flexible learning materials, and project management of materials development.

Having once designed learning resources for a print environment (which may have been supported by audio and video tapes), educational designers now design and develop e-learning resources, a significant expansion of their role. This study attempts to capture what that extended role is in a multi-campus international university that is increasingly using web-based learning and teaching approaches. Since institutional culture, according to Schwier et al (2004), is an important part of the educational designer’s identity, this study will describe the extended role of the educational designer as influenced by the Monash University culture.

**Research focus and scope**

The research focus of this study is the evolving role of the educational designer. The study attempts to capture the effect of change caused by technology on the educational designer role at a particular time, within the specific context of one organisation. (This context was described in Chapter Six).

The study arises from the question 'How has the educational designer’s role changed with the increased use of online technology in teaching and learning?’ This question is deliberately broad in order to capture unanticipated information which could have been missed if the focus of the study was more specific.
This broad study question explores the following issues:

- the service that educational designers provide when designing and developing material delivered using technology;
- the increased support expected from educational designers in the process;
- the changes this causes in their work processes; and
- the expectations that management have of educational designers’ roles in the present context.

While these are issues in their own right, jointly they contribute to answering the main question. The study is about the effect of online technologies and its impact on a specific group of professionals within a higher education institution and explores the many variables, parameters and dynamics that surround it. The individual educational designers are the sources that articulate and describe the change or the event that is of importance which is the focus of the study.

Answering this research question within the defined scope formed the basis of the research approach, affecting decisions about the method and the framing of interview questions, which are described in detail in the next section.

**Method**

The theoretical basis and the methodological paradigm for this study were described in Chapter 1.

The study question examines contemporary events and does not require experimental methods, numerical analysis, control or manipulation of behavioural events because this is a naturalistic inquiry investigating contemporary phenomena directed at participants’ experience in a particular milieu (MacDonald & Walker, 1975), with contextual conditions that must be deliberately covered because they are pertinent to the study (Yin, 2003). Therefore the case study method was selected as the methodology for this study.
The case is selected here because it is the only such instance and therefore the only source of description available in the given context. Data are available only in this one case. Sample selection was not a consideration as all educational designers participated with the exception of one who was the researcher.

**Extent of generalisation**

The aim of this study was not to create alternate realities and to generalise findings but to develop further insights into existing realities, and to develop rich contextual data from which generalisation to theory becomes possible (Bryman & Burgess, 1999). Since the case study approach was selected in order to maximise the opportunity to describe context-specific detail, generalising findings was not the main goal. Though educational designers in other universities may also be faced with some similar situations as a result of the implementation of online learning strategies, contextual differences in those universities may produce different results. For instance, educational design is not always a central function and nor is every university as widespread with multiple campuses as Monash, the context described in this study. Therefore, generalisation, though not impossible, needs to be approached with caution and ‘analytical generalisation’ as against ‘statistical generalisation’ would be more appropriate (Yin, 2003). As Platt (1999) states, ‘the question is not whether it can be done at all, but from what one can reasonably generalise to what’. Therefore, this study could form a basis for further studies through which other researchers could support, refute or build upon the results of this study, thus leading to a broader understanding of answers to the research question.

**Validity**

In order to construct validity, two key sources of evidence were used. All three educational designers as well as two key managers participated in the study. The educational designers responded to the same set of interview questions. All interviews were audio taped, transcribed and checked for accuracy against the original recording. Transcripts of the interviews were returned to participants for checking by them and also for a final approval prior to their analysis.
By way of building internal validity, pattern matching was conducted in the data analysis stage where the interview transcripts were content analysed and coded into categories and subcategories which included predetermined themes and emerging themes. NVivo® software was used for this. The categories provided a set of headings to present the findings cohesively. This approach to analysis set out to describe rather than explain the changing role of the educational designer.

The case study protocol developed to increase reliability of the research also served as a guide for data collection (Yin, 2003). It contained an introduction and purpose, data collection procedures, a list of participants, the interview questions and an evaluation plan. This ensured that data collection involved converging lines of inquiry through pattern matching which also led to triangulation of evidence. Data collection was therefore disciplined and pattern matching in the analysis stage was possible, contributing to the validity of the study.

**Participants**

The study group consisted of two categories of participants – educational designers and two managers.

Of the four educational designers at Monash University, three participated in this study while the fourth, being the researcher, refrained from participation in order to reduce influence and bias in the data collected and in the interpretations made. The other three educational designers contributed by reflecting on their changed role and functions.

The manager working in the role of technical advisor to the Deputy Vice Chancellor (Academic and Planning) and the manager who functioned as the Head of the Educational Design Group (a middle level manager) were selected because one of the main roles of the former was the technology adoption policy in the University while the main role of the latter was the management of the Educational Design Group. In depth interviews with these two participants explored management expectations of the educational designer in relation to University learning technology strategy, policy issues and how management perceived educational design in the study environment.
If quantitative descriptors were used, it could be stated that the whole population of educational designers in the given context with the exception of one, who was the researcher, participated as did the two managers. Demographically, the participants are described in Table 11.1.

Table 11.1  Demographics of participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Gender</th>
<th>Age range</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational designer 1</td>
<td>F</td>
<td>50-55</td>
<td>ED1</td>
</tr>
<tr>
<td>Educational designer 2</td>
<td>M</td>
<td>45-50</td>
<td>ED2</td>
</tr>
<tr>
<td>Educational designer 3</td>
<td>F</td>
<td>50-55</td>
<td>ED3</td>
</tr>
<tr>
<td>Manager 1</td>
<td>F</td>
<td>50-55</td>
<td>M1</td>
</tr>
<tr>
<td>Manager 2</td>
<td>M</td>
<td>55-60</td>
<td>M2</td>
</tr>
</tbody>
</table>

All participants were continuing full-time staff who had held their positions for at least three years prior to this study.

Formal ethical approval for their participation was obtained (Appendix 6) and caution was exercised to maintain anonymity though, because of the small numbers, individuals may be identifiable, at least to those who know them.

**Data collection**

Data collection occurred through collegial in depth interviews which were informal and conversational, allowing free exploration of participants’ perceptions. The main study question defined the interview questions and the resulting data (see Appendix 7).

**Interview structure** –

The interviews were conducted in two stages – an informal interview followed by an in depth interview.
The first stage –

The initial informal interview with each of the participants explored and narrowed down the study area. This resulted in refining the questions and discussing general educational designer roles. This interview provided the opportunity to advise participants about the study. The discussion enabled them to be reflective in order that they could be prepared with their responses.

The second stage –

The informal interview was followed by an audio taped in depth interview with each of the three educational designers and the two managers in their own work setting. Each interview was semi structured and lasted between 45 and 60 minutes. All educational designers were asked the same set of questions (Appendix 7). Since the aim was to encourage conversation and reflection, the questions were deliberately open ended, giving considerable latitude about how they were answered. Additional ideas emerging in the conversation were probed further using the researcher’s tacit knowledge.

Findings and discussion

A summary

The findings, in general, indicated that the increased use of technology in learning and teaching had important implications for educational designers. While their comments were at a micro, ‘coal face’ level, the managers’ comments were at a more macro, University-wide level and indicated a significant expectation placed on educational designers by the institution.

The managers were more ‘broad-brush’ in their comments. They considered that educational designers needed to assume additional roles and responsibilities in the areas of applying university technology policy, in contributing to knowledge and research on learning and teaching with technology, as well as to knowledge of wider issues such as globalisation and technology use and social responsibility. They concurred with the educational designers about the extended staff development role.
The collective view of the three educational designers was that, essentially, the role had not changed because there was no change in the basic principles of learning and the fundamentals of good educational design. However, demonstrating considerable similarities to Bird’s (2004) study, the findings revealed that increased technology use caused change in six key areas – in introducing technology into design; in meeting staff development needs; in working in teams; in the resource-creating processes; in giving general technical help; and in other additional areas. In order to function in these new roles, preparation and professional development for the educational designer was critical. The new roles adopted by educational designers are discussed below within these six key areas.

**Introducing technology into design**

All three educational designers and the two managers commented that it was a part of educational designers’ work to incorporate technology into design solutions appropriately. The analysis revealed that, in this capacity they take on three roles: of mediating innovative use of technology; designing integrated technology solutions and learning pathways; and advising on appropriate technology selection.

**Mediator of innovative technology use**

... electronic technology, it’s phenomenally different to what we had in correspondence education. Exploiting them is very, very difficult. (ED2)

Agreement was unanimous among the educational designers that successful technology incorporation depended on the degree of engagement built into learning designs that led to knowledge construction by learners. Design solutions they proposed needed to be creative and innovative in a way that inspired and promoted learning. Educational designers were constantly exploring new ways of promoting learning, examining strategies that would inspire learners and bring this knowledge to those they worked with and mediate the innovative learning approaches. They all pointed out that when designing for non-linear media with communication capabilities, they had to be more innovative than when designing for linear media which had basically only one learning
Both managers expected educational designers to support this role in the case of innovative technology use as well as mediating innovation with teaching academics.

**Designer of integrated technology solutions and learning pathways**

Two educational designers mentioned that it was their role to propose design solutions that incorporated, integrated and exploited the complex array of resources.

> How do you integrate these learning management systems with more highly interactive or more media dense materials . . .? And how does that have a relation to the book, the basic print materials? (ED1)

Educational designers proposed design solutions using multiple media with different learning pathways to suit different learning styles through techniques such as hyperlinks and cross-references which give learners options to use resources that best support their individual learning styles. One respondent highlighted that it is now an additional responsibility of the educational designer to integrate those resources and communicate to the learner how each resource is best used, by linking with and meaningfully supporting different learning activities. The role of designing integrated solutions and learning pathways did not feature as a role requirement in the managers’ comments.

**Advisor of appropriate technology selection**

Guiding teaching staff to apply technology appropriately to meet learning needs was unanimously recognised as a common role played by educational designers because

> . . . they come to you asking for the communication side of it rather than anything else, just requests for discussion groups and email . . . and occasionally the cost shifting of readings . . . that awful expression ‘putting it up on the web’. (ED3)

Therefore:

> . . . an important part of our role is this working with academics to reconceptualise what they do and make the most effective use of the technology. Or, in fact to reject it. (ED2)

Advising on appropriately matching the required pedagogical outcomes with technology in order to achieve desired learning outcomes, was seen as a crucial role of educational designers. In addition, recommending alternative media possibilities to achieve similar learning outcomes, was an extension of this same task.
Both participant groups recognised that educational designers are at the forefront of technology use in learning and teaching settings, because it is their role to be aware of current trends and developments in that area within the institution and outside. This enabled them to continuously attempt to be innovative and create learning experiences which are no longer ‘one dimensional and isolated’ (Johnson, Kemp, Kemp, & Blakey, 2002, p. 632). Their macro knowledge of the institution gave them a good knowledge of teacher practices across the institution, and made them better able to suggest learning designs that were cross-fertilised with different ideas or tried out in other settings. These innovative learning designs incorporated new technologies, facilitated learner communication, moved away from content-acquisition models, were less standardised and prescriptive, and were more customised, consisting of learner-centred, contextualised tasks that were authentic and relevant to learners with the teacher taking a less central role.

While details of design approaches concerned the educational designers, managers commented that educational designers should be innovative in the incorporation of technology. The detailed activities in this role, involved issues such as appropriate technology selection, technology integration, and engagement of learners, were left up to the educational designer to manage.

Educational designers played the change agent role, assisting and paving the way for innovation in flexible learning by introducing technology to design. This was also a frequently mentioned theme in Bird’s (2004) study. Schwier et al (2004, p. 87) described this role of educational designers as being ‘. . . problem solvers [who] invent solutions as a routine matter in their daily work lives.’ Segrave and Holt (2003, p. 8) described the educational designers’ challenge in designing resources for contemporary learning environments:

. . . it is timely for the education design profession to meet the fundamental challenge of designing learning environments requiring more holistic thought and action. E-learning environments certainly require micro-level education design, but within broader educational commitments to flexibility, attributes of student-centred approaches to learning, and more considered views of the attributes of a graduating university student.
Since models applied to linear media such as books and audio tapes do not apply to e-learning environments, educational designers have to now find new dynamic models (Morrison, 2003) that are self-motivating, lively and promote active learning, drawing from a range of media options.

**Meeting staff development needs**

All three educational designers confirmed that their regular staff development role had significantly expanded with the adoption of technology. The analysis indicated that they had now become diagnosticians of individual staff development needs, promoters of technology related pedagogy, recommenders of alternative media possibilities, information providers about the availability of new tools, and, at times, technical trainers as well.

. . . the more options you can offer the more staff development probably you need to take on because just from moving an on-campus lecturer to print, there’s still quite a bit of a process there . . . it becomes a little bit bigger as you add new technologies and new issues about how we might use them but the jump is pretty big . . . (ED1)

**Diagnostician of individual staff development needs**

Teaching academics’ competency related to technology use is varied and therefore the assistance provided by educational designers needed to be tailored to each individual’s general technological understanding and computer literacy. One educational designer observed that such a level of individualised support was previously not provided.

**Staff developer**

There was consensus among educational designers that they functioned as staff developers both in a formal and an informal way. A key part of this staff development concerned technology related pedagogy and some special needs such as e-moderating. Broadly, this role was performed in three ways by: (a) demonstrating examples, (b) providing workshops and (c) mentoring.
(a) Exemplar demonstrator

This role had gained importance as showing exemplars of good practice was a successful as well as a powerful and effective approach to enable teaching academics to transform their teaching approaches to more tech-rich flexible environments.

...we often hand out articles or sample resources or whatever we lay our hands on so I think it needs to be directed by whatever the need is, what the problem is, what the issue is. (ED1)

Bates (2000) acknowledged that teachers learn successfully from show and tell demonstrations by colleagues who have developed best practice examples of electronic approaches to good learning and teaching. Complementary staff development that supports technology adoption and improves understandings related to technology use, in turn, improves technology adoption, as was discussed in Chapter Three.

(b) Workshop resource person

All educational designers provided staff development through workshops and unanimously considered them necessary to support a growing need in pedagogically incorporating web-based technology in teaching.

(c) Mentor

Mentoring, a highly individualised approach, was recognised by all participants as a function that they continuously engaged in to consolidate skills teaching academics acquired through any other staff development opportunity. As confirmed by Daniel (1996), mentoring in new skills development strongly contributes to individual staff development.

Technical trainer

Two educational designers indicated receiving requests from teaching academics to help operate the technology or use specific software. Teaching academics need to be comfortable in operating the technology before they can successfully use the technological tools for pedagogical purposes:
. . . your role as ed designer starts to blur in that situation between a person who has to design the structure, the organisation, activities, giving advice on assessment in relationship to learning outcomes and activities to carry out to achieve those learning outcomes, to a person who sits down and says ‘this is the button to push’. (ED2)

However, better established support structures that provide just-in-time technical support within the faculty, help the teaching academic as well as serve to ease this burden on educational designers.

**Information provider of new tools**

All three educational designers commented that they now have to keep up to date with information on new tools and promote the understanding of those tools as they become available. Since teaching academics are not expected to keep pace with technological developments, advising them of the availability of suitable new tools is a new role:

. . . they would like to have something like a group discussion . . . but mostly they have no idea what they want to do with the technology. (ED3)

Both managers believed that since teaching academics were hired mainly because of their academic achievements and research contributions to their discipline, it was the role of educational designers to provide them with the appropriate training and staff development to use technology for teaching and learning:

. . . providing them an opportunity to improve, obviously has a staff development focus. . . . You educational designers are the means for them to make that improvement. (M1)

The managers believed that staff development functions of educational designers should include inducting staff to teach at Monash University, including helping them to understand University policy on learning and teaching and how to use pieces of software. They were convinced that educational designers had a role in driving and implementing the University’s learning technology policy. This, they believed, was an important new role and educational designers should:

. . . get at every single member of staff before they get in front of a classroom. And it’s not just about how to teach, it’s about ‘why’. (M1)
Information provider of all things related to technology and teaching at Monash University

The two managers saw educational designers as staff developers of all issues related to technology and teaching and learning at Monash University. The educational designer’s role was seen as extending from policy issues, to application of appropriate pedagogy, to training in ‘how to’ use technology, to maintaining an ongoing dialogue University-wide on these issues. As managers, their interpretation of the educational designer role was broad enough to encompass as many roles related to developing and introducing web-based learning and teaching approaches as possible.

The study identified a clear expansion in the educational designers’ staff development role. They provided teaching and learning support, course development and product development support, technological support, information resources and professional development. Though the staff developer role was more technology and pedagogy-related from the educational designer’s perspective, the managers gave the role great importance and a wider mandate to include the role of implementer of University policies, specifically the teaching and learning policy and the technology implementation policy, thereby expanding the political dimension of the role.

This change agent role related to social and institutional change was described by Schwier et al (2004, p. 92): ‘... people felt they [educational designers] were able to influence larger groups of people than they could in other educational roles.’

Schwier et al (2004) highlighted institutional changes such as the change in attitudes of teaching academics who had been helped by educational designers to transform their practice from content-centred to learner-centred design, the prominence of instructional design in a growing number of projects and an increasing appreciation for educational design by the management.

The educational designers’ significant staff development role was also recognised by Segrave and Holt (2003), while Bird (2004) highlighted staff development in relation to online teaching and learning and in developing flexible learning materials as the most frequent activities undertaken by participants in her study.
Working in teams

All three educational designers pointed out that increased technology use exerted major changes in their work teams which are no longer limited to desktop publishers producing print resources but now extend to web developers, IT specialists, programmers, graphic artists, simulation experts and audio and video producers who need to come together and contribute their expertise when developing highly interactive learning resources.

They have to acknowledge our role in the pedagogy of it all and we have to acknowledge their role in actually getting things built and making things happen and supporting the students and whatever, so communication is a very central issue. (ED1)

Such work teams and interactions have required educational designers to assume new roles including liaison, team administration and project management.

Liaison person

As a consequence of dealing with a large production team,

. . . you perhaps have more of a role in actually liaising with people to make sure that the things that you want to happen, happen . . . (ED1)

This liaison role also extends beyond the multi disciplinary production team to liaising with faculty information technology people who set up sites, load files onto servers and provide teaching academics with useful background technical support. As a consequence, the role has an organisational function which is not formal and designated, but assumed, in order to keep the team together and to ensure the smooth functioning of the processes. It is not a role of power but a role of diplomacy.

Team administrator and project manager

As the work group expands to a multi disciplinary team incorporating diverse expertise, the extended management function and coordination of the team has become an additional role for the educational designers. There was consensus in the identification of this additional role, highlighting that successful functioning of teams and positive outcomes were dependent on strong and often astute administration, effective communication and sound project management. These functions were now the
responsibility of educational designers who must ensure that tasks and timelines are met. One felt that the pivotal controlling position was essential for the sake of the pedagogy.

When you lose that, you also lose control of pedagogical aspects that you think are important and the processes that I think we need to go through in developing these kinds of materials. (ED1)

Consequently, planning, maintaining communication, managing and driving the project depended on the educational designer, an aspect of the role recognised by all the educational designers and also one manager (M2).

A team approach required for e-learning resource development which has precipitated educational designers into new project management and leadership roles was also highlighted by Bird (2004) and Schwier et al (2004). These roles makes it desirable for educational designers to have an understanding of some technical issues to facilitate better communication with technical staff which creates an additional demand on the educational designers’ skills base. ‘In addition to didactic and technical literacy, the implementation leader must also have social engineering skills’ (Collis & Moonen, 2001, p. 60). This was identified by Nation and Walker (1993) in relation to engaging with other professionals and working in partnerships and teams to develop learning resources. Production teams have become larger in order to include a range of skills which makes good communication critical. Organisational structures that allow or promote collegial cross-disciplinary partnerships and more critical debate and reflection on the importance of teams promote a better understanding of the issue. All educational designers commented on the enlarged team they worked with, and though they did not have the formal status of a project manager, they performed a similar function in a consensual way with the teaching academics and other team members. However, facilitating the cross-disciplinary partnership needed for these roles can be better enabled through policies, though it is only senior managers who are in a position to formulate policy.

**Resource-creating processes**

Technology introduction has caused changes to the processes of developing learning and teaching resources which, in turn, has had an impact on the educational designer’s role.
Project scoping and analysis

Previously, introducing a teaching academic to development of flexible learning resources began typically with an exploratory meeting about the nature of the unit, its requirements, content, expectations, difficulties experienced by learners and intended and existing learning activities. These explorations have become more complex with possible e-learning solutions considered at each stage, resulting in an extended project analysis time period.

Now that we’ve got more options, the ways that we might do things are broader. (ED1)

. . . it just means that you spend more and more time at the planning end of things. (ED3)

The availability of several alternative technologies and the inevitable extended decision-making process related to technology selection required educational designers to

. . . ask questions and try to help people in their own minds, what they want to do and whether the technology will really help them. (ED1)

Project scoping and the analysis process were extended.

Developing resources iteratively

Development and production processes for multimedia learning resources compared to print resources are significantly different. While educational designers iteratively developed print-based learning resources, iterative development of e-learning resources often include prototyping the product and involve the whole team.

. . . and I just don’t think that that [previous] model works. I cannot possibly conceptualise everything and then say ‘OK, here it is now, make it work’. I think the whole process of iteration has got to involve the production people and the educational designer needs to stay in it as the product emerges because otherwise things go haywire. (ED1)

When designing for new learning environments, educational designers must provide multimedia producers with specifications and requirements that can be executed:

For actual building of the electronic learning resource, the specifications must be handed over to the technical production persons. (ED1)
Commenting on linear media, Murphy (1994, p. 151-152) observed that ‘design problems cannot be comprehensively stated’ and are ‘ill defined’. It is no different with the development of e-learning resources which are built to address a unique set of requirements. The solution is produced iteratively with ongoing formative evaluation contributing to refining the product because of the complexity of the situation and the uncertainty about how to proceed (Moonen, 1999). Consequently, educational designers now tend to adopt prototyping as a design approach for complex e-learning solutions – an approach which facilitates the testing of the product with students and stakeholders. Segrave and Holt (2003, p. 9) described this approach as ‘proactively shaping the iterative crafting of e-learning environments’. These are process changes as a result of the introduction of new technologies into learning and teaching.

**General technical help**

While the managers did not identify the general technical help role educational designers provided, the educational designers indicated that they provide support as a general helpdesk person, as a webpage developer and a technical evaluator of tools.

**General helpdesk support person**

All educational designers claimed they were often consulted by teaching staff on matters related to media use and learning and teaching in a basic helpdesk capacity:

So you often act as a sounding board, just the first point of contact and you might push them in other directions. (ED3)

Often queries have little to do with educational design and include attempts to find help such as

. . . requests focusing on the ‘how’ rather than the ‘why’. How do I create a graphic, you know, that I can put into something? ‘Where do I go to get some video made?’ (ED2)

For quick answers, teaching academics consulted educational designers, indicating a highly individualised service expectation, though educational designers might not necessarily have all the answers, all the time.
Technical evaluator of new tools

Though educational designers are not expected to have technical skills to produce e-learning resources, the current demands on the job are such that two educational designers commented that having such skills is an advantage. There is an ongoing requirement for educational designers to increase their technological knowledge base beyond that required for print media. In addition, one commented on being regularly consulted to evaluate technology. Questions such as:

Which streaming server technology do we adopt? What’s the best? (ED2)

are asked of educational designers, calling for a knowledge of technical evaluation which may be outside their role and their expertise.

Webpage developer

Many teaching staff seek assistance from educational designers to set up websites, including WebCT® sites, and load resource files onto those sites. This is an extra level of support and a function that was not previously carried out.

For example, with the Social Work staff I’ve actually . . . done the setting up of all the discussion groups for them and linked their Portal pages to the websites and so on . . . they have needed a lot of pretty hands-on support. (ED1)

This webpage developer role was pointed out by two educational designers as an additional task that has impacted on their workloads, and again is an extension of their role as educational designers. Training for these technical roles is an additional demand on the educational designers.

Other roles

Quality controller

One manager stressed that educational designers must assume the role of quality controllers of e-learning resources and set standards and demonstrate them because when standards are absent, ‘people don’t even know that they are expected to comply’ and
People who are in practice are the best people to develop those kinds of standards. (M1)

This role expectation included tasks such as monitoring and evaluating so that

...at the end of the day someone else takes that material away and says ‘yes it does meet those goals’. That’s the process that’s missing. And that’s the whole monitoring and evaluation and it’s about quality. (M1)

This quality controller expectation of the educational designer role was extended further to include leadership in the use of technology in a socially responsible manner with consideration for ethical and moral issues related to society and equity.

None of the educational designers commented on their role as quality controllers and standard setters. Yet, practices of educational designers indicated that quality was crucial or they would not be conducting evaluations or prototyping products. Certainly, functions such as copy editing, proofing design documents and ensuring that designs produced conformed to those agreed design documents, is a quality assurance process that they carry out. Educational designers have a macro view of the University since they work across all faculties and this position makes it possible for them to easily recognise quality learning products developed across the University. It gives them knowledge of best practice examples across the institution which they draw from to demonstrate to other teaching academics, as well as recommend recipients for teaching awards.

**Grant applicant writer and intellectual property consultant**

Two educational designers spoke of their role in helping to write grant applications, including projecting and estimating budgets, while all three educational designers commented on their increased advisory role on intellectual property issues:

We work more closely now with people writing grants than we did in the past, means that you come across a whole range of issues about intellectual property, about funding and budgeting, about planning for projects, but you didn’t necessarily get them in the past. (ED2)

While budgeting and writing grant applications is a specific skill on its own, keeping pace with intellectual property issues related to e-resources in order to give sensible advice is a significant role expectation also identified by Bird (2004).
The need to deal with issues related to borrowing resources from within and outside the institution has resulted in the management of intellectual property and copyright becoming an additional educational design task. With increased use of reusable learning objects, educational designers need a strong basic legal knowledge related to copyright and intellectual property to manage their work as well as to be able to provide advice to teaching academics. They also need to make judgements about when to seek professional advice and how to apply that advice.

**Researcher and contributor to knowledge**

The managers were convinced that educational designers should be pioneering and academically contributing to a better understanding of how technology enables learning. Researching and extending the knowledge base through publication in the area was seen as an important role of educational designers, also identified by Bird (2004) and Schwier et al (2004):

> We should understand how technology can support the learning and that requires research. There is a whole lot of other things in terms of research into how technology supports learning that we know nothing about and we are not doing enough. (M1)

Elaborating on this, one manager noted that

> . . . keeping abreast of change is an important part of the job. (M2)

Two suggested methods were

> . . . by being involved in the doctoral program that has created the need for this interview. . . . and being involved in some sort of professional commune like ODLAA. . . . (M2)

Educational designers were expected to undertake these activities in order to perform the role of researcher who contributes to knowledge. The researcher role of the educational designer is not new but because there is much to be learned about how technology supports learning, there is pressure on expanding this role to contribute to the knowledge base.
Adapt to globalisation needs

Two educational designers commented that new technologies require them to have a good understanding of the learner groups they serve and one manager concurred with this. Web access and the quality of that access is an issue to be considered prior to design.

And we know that there are some areas of Australia that are just not well served by telephone lines. . . . A lot of it I think is ignorance of the market to some extent but you want to offer equity, you want to offer every equivalent education to all students. (M1)

Both managers felt that design solutions proposed by educational designers need to accommodate globalisation and changes in the world around us:

And I think also to take advantage of the way trends are occurring in societies. (M2)

The managers believed that educational designers’ needed to go beyond addressing the learning needs of a specific student group by being cognisant of socio-cultural issues associated with globalisation, connectivity and language.

Policy implementer

The introduction of new technologies has given a political dimension to the educational designers’ role. All participants (both managers and educational designers) saw the role of the educational designer as promoting university policy related to learning technology, globalisation and internationalisation, important in a university that positioned itself as an international university servicing learners globally. This included accommodating student mobility associated with globalisation through technology and serving multicultural learner groups.

[A manager] has been encouraging us to be encouraging them [faculty staff] to use the Portal and sometimes I think it’s us who are doing the pushing rather than the academic teaching staff member. (ED1)

While all three educational designers confirmed that they encourage and help individual teaching academics to adopt technology to promote learning and drive the University policy at ground level, the managers attached much importance to this role and felt that educational designers should be very active in it.
One educational designer pointed out that the role goes beyond application of policy to an advisory capacity in making decisions and assisting in policy formulation when educational designers are invited to participate in University committees and contribute to decision making processes related to University-wide technology adoption and use.

I have to engage with a whole group of individuals in the University which the traditional ed designer job didn’t do very much of so for instance I had to engage with ITS staff and I’ve been on a number of committees in the last 6-7 months looking at technology issues from the educational perspective and how they can support learning within the university. (ED2)

This function goes beyond design issues related to learning and teaching and into institution policy development areas.

The managers expected educational designers to encourage teaching academics to use e-learning and teaching approaches. Morrison (2003, p. 22) warned that to implement e-learning successfully one must be prepared to work hard and climb a steep learning curve. Educational designers’ comments expressed this indirectly. Placed in a policy implementation role, they commented on increased workload and the need for continuous staff development for themselves, possibly because they were experiencing that steep learning curve with little assistance.

**Issues arising**

The findings highlighted two issues – the importance of staff development for the educational designers and issues concerning future directions, both related to the new roles educational designers undertake.

**Staff development for the educational designer**

... who provides the professional development for the professional developers, and that’s a real issue and I don’t think it has been addressed yet ... (ED2)

All participants stressed that to guide others effectively through new e-learning approaches, educational designers themselves must keep up with the changes in an ‘area that is more fluid than quicksand’ (ED3). They lamented that while the range of required skills has widened (e.g., knowledge on intellectual property issues, project management,
web development), the complementary professional development was lacking. Consequently,

[a] lot of the time we are struggling to stay one step ahead of everyone else, given the environment we are in. (ED1)

Since opportunities are limited in an evolving field,

...most of the professional development, you have to generate a lot of it oneself. In terms of what you read, which seminars you go to, which seminars you make time for, and whether you engage in activities that are going to do that. (ED1)

They commented that opportunities for staff development must be found through conference attendance, reading, workshops, surfing the web and conversations with colleagues. Parer (1993, p. 9) pointed out the need for educational designers’ own professional development. While managers acknowledged this requirement and cited more formal methods such as engaging in doctoral studies and being a part of a professional commune like the Open and Distance Learning Association of Australia (ODLAA), the staff development need for educational designers was considered less acute by the managers.

The future

All participants confirmed the expanded role of educational designers.

I just think our job description is going to expand, not going to get smaller. (ED2)

Our overall skill levels in a variety of domains are going to have to improve. (ED2)

I think the amount of academic staff development we all have to do will actually increase. The other thing I think is actually going to increase our workload. (ED1)

I think we have a very interesting and a really diverse job. The last thing you are ever going to do is to get bored with it. But you may be occasionally overworked. (ED2)

An increased workload and being overworked were real concerns for two educational designers while the managers were optimistic about the future of the educational designer role. One manager measured the increased importance of the role through the increased employment advertisements in the newspapers:
In the next few years I think our credibility will be confirmed. I think there’s an increasing recognition within education, within universities that this is a very important role. You only have to read the job ads to see that. (M2)

Educational designers may be soon designing for learning situations such as those predicted by Collis and Moonen (2001, p. 108) where there would be a move away from content acquisition to ‘contribution-oriented learning activities’ where learners contribute, and the course and the related resources emerge through that participation while educational designers develop activities for that process to happen.

**Conclusion**

Evidence from this study clearly indicated change in the educational designers’ role in six specific areas. These were: in introducing technology into design; in meeting staff development needs; in working in teams; in the resource-creating processes; in giving general technical help; as well as in additional miscellaneous related areas. New roles within those six areas were identified and the need for staff development for educational designers and the possibility of an ever increasing workload in the future were acknowledged as issues arising from the new roles and responsibilities.

Further studies will confirm whether this situation is common to other institutions. One participant summarised the role succinctly:

> It’s multifaceted, it’s part educational designer, it’s part educator, it’s part technologist, and also it’s got a political element to it as well. (ED2)

The role has been both a leading and supporting one encouraged through strong partnerships and collegiality (Pan, Deets, Phillips, & Cornell, 2003) with teaching academics and support staff. This continues to be so while technology use to facilitate learning has contributed an additional dimension to the leading, supporting and partnering roles.
Elective 2 - Client diversity: Voices of the students
Overview

Web-based learning approaches provide flexible learning methods which require students to be independent and take responsibility for their learning. Universities are using these approaches increasingly for teaching and learning, and as more and more teaching academics embrace the technology, the readiness of students to learn in new ways deserves consideration. In a higher education institution students are the main customers and it is important to find out their expectations as they are key drivers of innovations (Bell & Bell, 2005) such as using learning management systems and other technology applications in their courses.

For this exploratory investigation, Basic Design, a unit from the Faculty of Art and Design was selected because it did not include web-based learning and teaching approaches and because it is a mandatory first year undergraduate unit taught traditionally face-to-face using classroom and design studio methods. The unit relied heavily on face-to-face contact with the teaching academic and tutors and especially the teacher-student and student-student interaction in the design studio. Since the students were familiar with the learning management system and similar technology applications in their other courses and units, they possessed the experience and the exposure to comment.

Using the case study method, data were gathered through focus group interviews. (See Appendix 8 for ethical consent form and plain language statement issued to participants and Appendix 9 for interview questions.) The study aimed to determine students’ readiness for flexible learning by investigating and analysing commentary from the key three student groups in the class – local Australian students, South-East Asian students and international students. Students were asked about their readiness to undertake their learning in flexible modes; their approaches to study in an area that is creative; and their
openness to using technology. The findings of the study related not only to student readiness for technology use, but also provided data on their experiences as first year students. The findings of this study were published in *Distance Education* Volume 26, Number 1 May 2005, pp. 49-66 under the title ‘Determinants of student readiness for flexible learning: Some preliminary findings’. This article is provided here in its published form as Elective 2.
Technology adoption is not controlled by access to technology alone. This closing chapter highlights the complementary strands of the three studies in this folio which explored the range of complexities that affect technology adoption. From the perspectives of teaching academics, educational designers and students, the three studies showed that University-wide availability of state of the art technology does not necessarily translate into widespread technology adoption. The impact of adoption on the three stakeholder groups has been explored through a case study approach, and technology adoption in a large higher education institution has been analysed and described through their voices.

Voices of teaching academics

The collective voice of the teaching academics in the Dissertation on technology adoption focused on the use of technology for providing effective learning opportunities for students. The teaching academics in the study adopted web-based learning and teaching approaches to meet institutional requirements such as satisfying top-down authority directives, boosting student numbers, responding to political imperatives or because they had received funding grants. Some of their learning-related reasons for adoption were the ability of technology to hyperlink to other online resources, to address a specific learning need, to make student learning dynamic, to provide learner cohorts with their own site and individual web pages for individual learners.

Teaching academics recognised and valued the communication possibilities of the web such as the ability it provided for them to reach off-campus learners or to make resources available for students who have timetable clashes. Adopting web-based...
approaches also enabled them to prepare students for their future professional roles such as being able to operate as a translator in a global environment. The ability to manage group assignments, and the economic advantage to the University of distributing learning resources free via the web to students who bore the printing costs, were other reasons for adoption. In addition, teaching academics were influenced to adopt web-based teaching by peer group support networks, colleagues, or simply by being convinced by the academic literature. Others adopted technology for more personal reasons such as academic satisfaction and as a professional choice which would be strategic to their careers through following the University’s strategic plan.

The findings of the study showed that several important contextual conditions had a major impact on moderating the extent of their technology adoption. Time constraints and heavy workloads limited teaching academics’ opportunity to experiment with technologies which led to adoption. The University demand for research output also took a higher priority over innovative teaching and exerted additional pressures on their time and effort. The training and staff development that was required to reach a level of competence for web-based teaching, and the lack of strong and established policy related to web-based teaching at faculty level, all strongly regulated and affected teaching academics’ views of their ability to adopt web-based learning and teaching, as well as the extent of such adoption.

As a consequence, the teaching academics interviewed were at various stages of adopting web-based learning and teaching approaches. While some had implemented blended learning environments that successfully and effectively integrated face-to-face approaches with internet technologies, others simply offered resources via the web to enhance their dominant teaching approach which occurred either through face-to-face teaching for on-campus learners, or via print resources for off-campus learners. A few teaching academics were slow adopters with static websites that were add-ons to unit resources rather than integrated with their other teaching approaches, and these staff members took longer experimenting with and exploring the capabilities of web-based learning and teaching approaches.
Adoption of new learning and teaching approaches through web-based technologies resulted in an additional workload to all teaching academics because developing new learning resources was time consuming and encroached into the time they devoted to their discipline-based research. They had to master the technology as well as technology-related pedagogies in order to make their teaching effective and this created a significant, complementary and ongoing staff development requirement that needed to be effectively backed by rewards as well as supporting and enabling policies to facilitate and promote adoption.

Four teaching academics in the study were considered leaders in the field of web-based learning and teaching as they participated in technology-related committees in their respective faculties and voiced their informed suggestions and concerns. The study also showed that some faculties were better organised than others in providing the mediating factors described above to support the adoption of technology. This demonstrated and helped to explain the uneven, unequal and asymmetrical nature of adoption at the level of the individual teaching academic as well as at the faculty level.

**Voices of educational designers**

The findings of the Dissertation showed that effective pedagogical and technical support in web-based teaching encouraged its adoption by teaching academics. As teaching academics introduced web-based teaching to their courses, Elective 1 demonstrated that the educational designer's role became increasingly important as technology adoption in higher educational institutions expanded the role of educational designers. Educational designers became responsible for introducing technology into design solutions and for suggesting and encouraging innovative uses of technology by teaching academics. They also assisted and advised teaching academics in the selection, use and integration of technology appropriately.

The group of educational design professionals in the study had responsibility for providing staff development that helped staff understand the pedagogical basis for applying technology to learning, and for training staff in the use of technology, as
well as providing them with information on the potential use of new and emerging technologies. Increased use of web-based technology across the university meant changes in the types of work teams that were needed for developing learning resources and educational designers often became project managers, liaising with multimedia producers, desktop publishers, audiovisual producers and graphic artists in order to create learning resources to be used in web environments. Educational designers were also required to contribute to knowledge in this field by engaging in research, and to adapt learning designs to accommodate the new demands that globalisation of courses required. They had to become experts in the new University policies related to technology adoption and use, as well as become advisors to teaching academics in the application of these new policies and requirements.

The role of educational designers had changed and expanded dramatically when compared to their previous role in designing and developing resources for a print environment exposing an important need for professional development for educational designers in a 21st century university environment. The importance and complexity of, and the need for their supportive role in technology adoption were highlighted. This study also drew attention to the need for educational designers to focus on the new student population that was entering the University, and the consideration of student needs was the basis of the final folio elective.

**Voices of students**

Learners are an important group of stakeholders who must be kept satisfied particularly in the new university environment that encourages fee paying students in a market economy of university choice. The majority of the students at Monash University are young school leavers undertaking an undergraduate degree. According to recent University statistics, 70.4 percent of the entire student population are undergraduate students, 30.6 percent are international students and nearly 17 percent study off-campus (Monash University, 2005c).

The findings of Elective 2 showed that not every student cohort is ready for flexible, independent study. While the use of technology provides the advantage of flexibility,
learner independence is needed to manage that flexibility and the first year design students in this study found independent study to be challenging. Therefore, introducing web-based learning and teaching approaches is a joint responsibility of teaching academics and educational designers to collaboratively explore and assess student readiness for flexible, technology-moderated learning approaches, and design learning resources appropriately to suit the needs and abilities of each student cohort and the diversity within each cohort. Teaching academics and educational designers need to reflect on web-based learning designs that are learner-centred and consider student needs and student readiness to work with certain learning approaches such as those required in web-based learning that involve learners in managing and pacing their own learning, particularly in creative disciplines such as design, as evidenced in this study.

**Implications of the collective voices of teaching academics, educational designers and students**

The three studies showed that adopting and using web-based learning and teaching approaches was complex and multifaceted. The institution, its people, structures and processes must all adapt, evolve and grow in order to be able to provide effective, engaging, student-centred web-based learning environments. Students, in turn, must be enabled to manage their study, make effective use of web-based approaches and maximise their learning experiences.

The voices of the teaching academics, educational designers and students in the three studies highlighted that technology adoption was influenced by the context, encouraged by supporting and complementing staff development and assisted by changes in work processes and institutional structures.

**The context**

Each institution has its own unique culture, values and politics, and Monash University, where these three studies were conducted, was no different. Its unique context shaped the way adoption occurred and continues to occur. The voices of the
teaching academics in the Dissertation showed that in addition to the larger Monash context, their individual faculty contexts were influential in their technology adoption decisions as well as in the teaching approaches they adopted. They were strongly influenced by a variety of imperatives including authority directives, staff development opportunities, funding grants and time release for innovation. Those faculties that had nurturing contexts and established user groups that encouraged technology adoption and teaching innovation had a higher incidence of successful integration of web-based learning and teaching.

For educational designers (Elective 1), the context was important because they provided a central service offering support University-wide. With more teaching academics adopting web-based learning and teaching approaches and with the University adopting an institutionally supported web-based learning management system, the context within which educational designers operated was rapidly expanding.

The voices of the students (Elective 2) clearly articulated that teaching academics and educational designers need to consider the learner context carefully before design solutions are implemented. In particular, those learner groups that consist of young school leavers who work in creative disciplines, and have multicultural needs, highlighted the necessity to consider the learner context carefully and explore more teacher-directed approaches. As more and more students come from diverse backgrounds, their learning needs and study practices call for reflection and understanding by educational designers and teaching academics who will have to find learning models that are dynamic, self-motivating, lively, active and draw on a range of media.

**Staff development**

The importance of staff development was highlighted in all three studies in this folio. The findings of the Dissertation highlighted that technology adoption needs a staff development strategy that effectively complements the institutional policy and its vision, which is provided centrally, and tailored to align with the needs and perceived
needs of the teaching staff. If learners are to be engaged in their learning, then teachers must provide engaging, relevant and learner-centred e-learning resources. In the rapidly evolving area of educational technologies, providing teaching academics with staff development in using the technology in a pedagogically appropriate way to make their e-teaching effective, is a critical need. While educational designers provide staff development to teaching academics in relation to learning designs and appropriate use of technology, educational designers themselves also need staff development to work with new pedagogies related to changes in technology, to maintain their competency and be able to assist teaching academics in their work. The interactions of teaching academics with educational designers must include basic training in the use of technology, combined with conversations about vision, possibilities, directions the changes are taking them, while making such changes meaningful to the individual teacher’s needs and to specific student cohorts.

Preparation for change

All three studies showed that technology adoption calls for changes in many areas. The university workforce structures need to adapt to working with new technologies and there needs to be a ‘transformation of the university’ (Peters, 2000). The findings of the Dissertation showed that supportive funding; supportive technological infrastructure; technical, media and pedagogical support; staff training; and new organisational structures that support new kinds of work should be part of the ‘transformed’ university. Existing policies and structures will have to be reviewed. For example, the University will need to re-evaluate its information technology policies and consider them against its learning and teaching policies. The University will have to adopt a process of monitoring and reassessing structures, strategies and processes in order to evolve and grow. Some information for this activity will have to be drawn from all stakeholders, particularly teaching academics, students and educational designers. Consideration must be given to the mismatch between resources provided and work required to be done, with incentives, credit and recognition provided for teaching academics to adopt technologies. Educational designers (Elective 1) must be prepared to work in multidisciplinary teams,
developing new work practices such as prototyping multimedia resources, and designing learning environments for a range of learner cohorts.

While the findings of the three studies serve to improve the understanding of technology introduction at Monash University, the studies communicate that the University has many stakeholders who draw from as well as shape the institution through their varying needs, activities and interactions. Overall, the three studies in the folio reveal a range of challenges and opportunities, all of which are well known in higher education settings. Adoption of web-based learning and teaching for teaching academics, educational designers and students involves new learning, experimentation and some risk-taking in dealing with a new set of obstacles, all of which are described in this folio.

**Conclusion: Changing times**

All three studies were conducted in a dynamic environment of technological change as well as change in higher education. During the period the dissertation was written, more teaching academics adopted web-based learning and teaching, the University upgraded its learning management system to a newer version which required a degree of retraining for many users, including some study participants. Across the University, many more units and courses were offered with an online component. Innovation and change within the University are continuous and constant. Despite the defined need found in this study for the support of educational designers in technology adoption, this role is threatened in a changing university environment which must respond to government pressures and policies.

The higher education landscape is a volatile quicksand. The reality is that, while technology adoption is critical for institutions to move with the times, and while good pedagogy that supports the adoption of technology has been shown to be crucial, support for pedagogy is fragile in the face of economic pressures and pressures for research output. Technology adoption will continue to occur while it is also shaped and influenced by the changing times.
Appendix 1  Deakin University Ethics Application

DEAKIN UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE

CONSENT FORM: Participation

I, [Participant's Name], of [Address]

Hereby consent to be a subject of a human research study to be undertaken

By Gayani Samarawickrema

I have read the Explanatory Statement for Participants relevant to this research study, and I understand that the purpose of the research is to examine how the role of the lecturer has changed with the increased use of information communication technologies and learning management systems in subjects taught through flexible learning. In the process, I understand this study will explore the learning materials developed for this subject. The findings of this study, I believe, will be useful in better understanding the changes lecturers need to make as technology use becomes more widespread and student populations become more global.

I acknowledge

1. That the aims, methods, and anticipated benefits, and possible risks/hazards of the research study, have been explained to me.

2. That I voluntarily and freely give my consent to my participation in such research study.

3. I understand that aggregated results will be used for research purposes and may be reported in scientific and academic journals.

4. Individual results will not be released to any person except at my request and on my authorisation.

5. That I am free to withdraw my consent at any time during the study, in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Signature: [Signature] Date: [Date]

Should you have any concerns about the conduct of this research project, please contact the Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123).
DEAKIN UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE

EXPLANATORY STATEMENT FOR PARTICIPANT LECTURERS

Date:

Project Title: Online learning and changing faculty roles

I am Gayani Samarawickrema, a student of Deakin University, reading for an EdD. A research project is part of a folio of this study programme. This study is undertaken under the supervision of Dr Elizabeth Stacey, a senior lecturer in the School of Scientific and Developmental Studies of the Faculty of Education, Deakin University.

The aim of this study is to examine how the role of the lecturer has changed with the increased use of information communication technologies and learning management. In the process, the study will explore the learning materials developed for this unit. The findings of this study, I believe, will be useful in better understand the changes lecturers need to make as technology use become more widespread and student populations become more global.

I am seeking Monash University lecturers who use information communication technologies (ICTs) in order to be innovative in their teaching, and learning management systems (LMS) to mediate that exercise with student populations locally and globally who will be prepared to be interviewed by me. The two interviews will take about 45 minutes each, when your opinion will be sought on the changes you made in order to make this transition. The interview discussion will cover your efforts in integrating a learner-centred, learner driven approach mediated by ICT and LMS, your experience of working in multi disciplinary teams, the planning and development of learning resources suitable for local and global student groups. In addition, the significant changes in your pedagogical, administrative, managerial and social aspects in your lecturer role would be of great interest and relevance.

The interviews will be audio taped, transcribed and transcripts sent to you for any additions and corrections you wish to make prior to my analysis.

No findings will be published which could identify you as an individual participant and anonymity is assured. Access to data will be restricted to myself and my supervisor and the data will be stored in a locked filing cabinet in my office for six years, as prescribed by university regulations.

Participation in this research is entirely voluntary and you may wish to withdraw your consent to participate at any time, or decline to participate in any section of the study by not responding.

If you have queries or would like further information, please contact me on telephone (03)9903 2339.

Thank you.

Gayani Samarawickrema

Should you have any concerns about the conduct of this research project, please contact the Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123).
## Appendix 2  Monash University Ethics Application

### Monash University

STANDING COMMITTEE ON ETHICS IN RESEARCH INVOLVING HUMANS

SUMMARY OF APPLICATION FOR MULTI CENTRE RESEARCH PROJECT WHERE ANOTHER HUMAN RESEARCH ETHICS COMMITTEE HAS APPROVED THE RESEARCH AS THE PRIMARY HUMAN RESEARCH ETHICS COMMITTEE

(Where a multi centre research project has no primary HREC a full application should be made to SCERH. Where a multi centre research team nominates SCERH as the primary HREC, a full application should be made to SCERH.)

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Online learning and changing faculty roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>HREC with primary responsibility for the research</td>
<td>Please identify which human research ethics committee accepts primary responsibility for the scientific and technical assessment of the project and its ethical review. If the project has been approved at multiple sites, they should be listed.</td>
</tr>
<tr>
<td></td>
<td>Deakin University Human Research and Ethics Committee</td>
</tr>
<tr>
<td>Chief Investigator/Supervisor</td>
<td>Gayani Samarawickrema (Chief Investigator)</td>
</tr>
<tr>
<td></td>
<td>Dr Elizabeth Stacey (Supervisor)</td>
</tr>
<tr>
<td>Department / Faculty / Campus</td>
<td>School of Scientific and Developmental Studies in Education, Faculty of Education, Deakin University Burwood Campus</td>
</tr>
<tr>
<td>If you are transferring from another institution please name the institution</td>
<td>I am enrolled in the Doctor of Education program at Deakin University and conducting this research as part of my study.</td>
</tr>
<tr>
<td>Other Investigators</td>
<td>None</td>
</tr>
<tr>
<td>Contact Person</td>
<td>You should provide a Monash University Department address. If you wish to notify a personal address or other details these should be provided on a separate page which will be kept as a record. You can access this information by calling (03) 9905 2052 or e-mailing <a href="mailto:scerh@adm.monash.edu.au">scerh@adm.monash.edu.au</a>. The information is for the</td>
</tr>
<tr>
<td>Granting Body / Scheme</td>
<td>Committee's use only.</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
<tr>
<td></td>
<td>Centre for Learning &amp; Teaching Support, Monash University Caulfield Campus</td>
</tr>
<tr>
<td>Grant ID No.</td>
<td></td>
</tr>
<tr>
<td>Commencement Date for human data collection</td>
<td>31/01/2003</td>
</tr>
<tr>
<td>Completion date for project</td>
<td>31/03/2004</td>
</tr>
</tbody>
</table>

Does this application involve any of the following

Use of existing records not ordinarily available to the public  
Use of de-identified data:  
Is this a Clinical Trial?  
Does is involve the CTN or CTX Scheme?  
Are Children involved?  
Does research to be conducted at Monash University require clearances?  
Animal  
Biosafety  
Ionising Radiation  

Has the data collection already commenced? No

Mail THREE hard copies of your application to the other HREC and their approval, including any attachments and relevant correspondence, with this summary form to: Secretary, Standing Committee on Ethics in Research Involving Humans (SCERH), Research Grants and Ethics Branch, Building 3d, Monash University, Victoria 3800. Telephone: 9905 52052

Or deliver to: Room 103/104, Building 3d, Clayton Campus.

NAME (print): Gayani Samarawickrema

Signature: Date: 18th December 2002
Appendix 3  Open-ended interview questions for teaching academics

Reflect on how this subject was presented two years ago.

What influenced your decision to offer your subject online?

Explain past experiences in developing flexible learning material.

What is the impact of technology on what you are doing now, in teaching flexibly?

How has it changed the nature of your job?

What changes have you had to make in your pedagogical approach?

What changes have you had to make in your management techniques and approaches?

What changes have you had to make in your dealings with students?

What changes have you had to make in your general administration tasks?

How has it affected your use of time?

What strategies do you use to manage the use of new technologies?

How did you acquire the skills required to use them?

How much did the centrally available support (such as ITS, CeLTS) assist you in developing your resources?

What further assistance do you believe you should be given in order to make a successful and stress-free transition to using learning management systems and information communication technologies?

Describe your transition and professional growth in the process.

What pressures and stress factors were encountered in this process and how do you think you should have been supported in order that they could have been avoided?

How do you suggest they be better addressed? What processes do you recommend be put in place to avoid such situations in the future?

What is the gap between your expectations from the university, faculty, central organisations such as ITS and CeLTS, and the service you received from them?

In your opinion, what processes need to be put into place here to bridge such a situation?
Appendix 4  Example of field notes

Portraits/sketches 01 – Carman  24 June 2004

BND3011 Food Science and Skills – undergrad

Teaching in Higher Ed – Since 1973

Teaching online – Since 2001

What they tell, a small snapshot of their technologised teaching life

Embraced online approaches because WebCT was just being introduced in the faculty; became part of a user group which gave insight into possibilities of online learning as a “more interesting approach” suitable for various off-campus situations. Its access conveniences accommodated the mobility of her students who go on rural placements.

Teaching approach

Case based to encourage integration of the learning.

Taught “largely the same way” with the incorporation of WebCT. Had PowerPoint slides of lectures, case studies for tutorials, model answers and quizzes on her site.

Independent learning - learners expected to read, develop answers to tutorial questions based on cases provided on WebCT. WebCT used to have learners prepared when they come to tutorials which in turn contributes to a better quality discussion.

Learner-centred - skills are gently built along the way and demands are realistic recognising the unfamiliarity of WebCT of learners.

Required to share and contribute - submit relevant websites with an evaluation – exercise promotes higher order thinking.

Site at the end of semester is a repository of all learners’ research work. Performs the function of the gatekeeper role by managing all files.

WebCT site set out largely in a linear way was used to deliver material

provide standardised material such as PPT slides, model answers, quizzes for revision and self-study to reinforce learning.

inform learners of activities related to their study

My Files area used as a filing system which has helped with being efficient and used with the time release function, has contributed to timeliness.
The portraits have patterns, issues, concerns themes that occur across

Belongs to a small group in a large faculty. Smaller groups have greater difficulties when it comes to funding and expenditure on specialist software.

Unevenness in attitudes towards new technology and their adoption (attempts to integrate in an ongoing way)

Believes that return on investment (ROI) in time must be considered in order to judge the effort and time to put in. As a leader in the uptake and use of online technologies, she is aware of how others following her will need to invest time and effort. ROI is slow and therefore making decisions is hard.

Doubts, suspicions and fears

Took the plunge to embrace WebCT believing in its capabilities. Forward thinking and unfazed by its challenges future expansion. Curiosity and the belief that there was potential made her volunteer to be a part of a user group.

The user group was supportive, collegial and encouraging. Since the whole group was new to WebCT they took a problem solving approach which assisted the pioneering spirit of individuals in the group. Encouraging and supportive colleagues within the department. The ability to ask questions, show and share work and to persevere was to her advantage.

Various forms of vulnerability

The lack of sufficient computer skills which limited her participation with the user group; web page development skills; knowledge of software such as Dreamweaver and FrontPage; and the knowledge to link and work with multimedia files and methods to get away from standard PowerPoint were recognised as serious disadvantages. Other disadvantages identified were the lack of exposure to working with publishing houses that have companion websites to textbooks and the experience to integrate those resources; techniques of developing resources for flexible off-campus learning; and the lack of exposure to websites and resources created by teachers in other faculties. Geographical isolation (being located in the Monash Medical Centre) from the rest of the university significantly reduced interaction with teachers from other faculties who might have contributed to professional development and reduce feelings of isolation. Being a small hospital based group, the additional disadvantage of isolation is further highlighted with difficulties experienced in accessing other support structures/personnel in the university.

While becoming familiar with WebCT is time consuming, its potential and opportunities as well as further gaps in knowledge and skills become obvious.

Attitudes – a wide spectrum of attitudes and personal positions with respect to the significance of technology in learning and teaching.

She believes that WebCT has helped her to be better organised through the enforced filing system in the My Files area and the timed release function.

Believed in its potential for learners and was highly motivated and deeply involved and influenced by faculty use of WebCT

However, she was of the opinion that for problem solving, the discussion tool in WebCT was a poor comparison to talking directly with the learner.

Boundary-pusher spirit
She was convinced of WebCT’s potential for learners. Her comments revealed her general personality to be enthusiastic, curious, open minded and group oriented. She was ready to learn from anyone, and loved exploring new possibilities which “drove” her through all these developments. Her enthusiasm and determination made her ‘hang in there’, stay with the user group and see problems as potentials and learn as much as possible.

Being a member of the user group, she participated in policy discussions and policy making and was involved in charting the course by contributing to the dialogue related to policy formulation.

As she became more comfortable and gained confidence with WebCT, she outgrew, interacted less and became less needy of the user group support. Her comments were more reflective and were about developing an individual style. She was able to be critical of some of the previous approaches adopted such as plugging in WebCT to an existing course without making it a part of its overall design, demonstrating a maturing process.

As any enthusiastic pioneer, she sees potential and has future expansion ideas though strategies to be more efficient with time and effort were not considered.

Pushing boundaries calls for more skills and new skills.

Having spent most of her life as a researcher and only the last three years as a teacher, she is trained to explore alone and ready to self-teach as any pioneer.

Experimenting and exploring new approaches to teaching and learning with WebCT provides intellectual stimulation, opens her to new methods of doing things, provides professional development.

Believes that technology is assisting her in being a better teacher and positive feedback from the learners has been encouraging.

She was viewed as the leader and the unofficial role model in the department and her website an exemplar site that led to generation of interest in others. Consequently, consultations and requests for help found her performing functions ranging from helpdesk and advisory to mentoring which she generously believed would have a spiralling department-wide effect. Their trust in her was such that many provided her with designer access (the highest level of access which allows alteration of resources) to their sites.

Students request the use of WebCT once they become familiar with its use in another unit. Their demand has an effect on adoption of the facility.

Tensions surrounding the development and use of new technologies

Time

Providing assistance to others in the faculty is time consuming. Interaction with students online is additional time.

Need time to develop resources suitable for the learning environment as well as to understand and apply WebCT tools appropriately and this has encroached on personal time. She accepts that learning something new requires time.

New literacies they had to cope with
Purchased Dreamweaver for her home computer and learned the new software in order that she could develop web pages. Also learned FrontPage, linking video and audio files.

As the boundaries keep changing, the need to learn new programs is important as well as being able to practice it and to be confident to apply it efficiently.

Having recognised the need for training and skills, she had to opt for it request for help. Was the kind of personality who was comfortable asking for help. Help was provided only on demand and usually when one was desperate.

As a pioneer, there is a need to help and support others who come to you.

New technologies demand a new set of skills such as file organising, typing which teachers often lack.

Methods of tackling the challenges

Faculty has technical support offers training and refresher courses. These are unpredictable in their degree of usefulness.

The faculty also has a Technical and Flexible Delivery Committee that is responsible for policy formulation, moderates the discussion and tables the issues and dialogue related to technology and flexible learning.

Sought out followed all training courses offered by the university

WebCT assists the management of the unit by providing a structure to organise files and resources.

Direction and guidance for selecting appropriate software for the task, supporting the software, tailored individualised advice, would be of help in tackling the challenges. In addition, information that keeps one abreast of relevant developments in the IT field that is applicable to learning and teaching is important.

Is concerned about access, equity, download-ability as learners use WebCT while on rural placements. This leads her to cover all aspects in the print material provided which defeats the exploitation of the online medium as well as contributes to additional work for the teacher.

Tensions between competing values and priorities such (e.g., research)

A powerful computer on one’s table is associated with increased expectations.

With reduced secretarial assistance, admin role as a teacher has increased. It competes with research time.

Strategy for embedding technology and pedagogical devices

WebCT provides the possibility to review and edit resources while evaluating its overall structure.

Common to nearly all of them was commitment, energy, enthusiasm, hard work and perseverance. Looking for ways to make things work.
Portraits/sketches 02 – Marg 03 May 2004

Very ready to talk, also a doctoral student

Is a fore runner in the faculty. Selected for the Vista pilot project. Unit was originally presented in WebCT but now being piloted in Vista.

Very proud of her website. Added me as an auditor in her LMS project.

LMS auditor for colleagues’ sites.

Her website is far superior to many others (in this study)

GIF files in header customising her materials right from the start.

Has a projects repository for all the shared resources – resources she provides for tutors and the lecturer in South Africa.

All resources in one learning module and one table of contents

Back up of print material in PDF provided via the site.

Has organised the learning module in 2 ways –

1 - in levels and hierarchy

2 - using icons only

Website has -

links to other websites

online resources to a textbook

movie

projects info, guides and templates

Report writing tool
Appendix 5  NVivo subject categories/tree

Nodes in Set:  All Free Nodes
Created:  18/05/2004 - 2:45:12 PM
Modified:  18/05/2004 - 2:45:12 PM
Number of Nodes: 39
1  Appropriate use of tech (tech use)
2  Barriers
3  Class size
4  Communication with students
5  Confidence
6  Dialogue
7  Email
8  Evaluation
9  Evolving
10  Expectation & Demand
11  Experimenting
12  Experimenting - 'give it a go'
13  Exploring
14  Faculty standing
15  Grant funding
16  Help - reaching out for
17  Help desk for students
18  Influence on decision to develop online
19  Interactivity online
20  InterLearn
21  Job satisfaction
22  Moving to WebCT
23  Online components
24  Online developments
25  Online developments - underestimating
26  Opinion on developing online resources
27  Personality
28  Professional development needs
29  Professional growth
30  Relevant experience
31  Resources
32  Responsibilities
33  Strategies - Time management
34  Stresses
35  Student centred approaches
36  The students
37  The Unit
38  Website-home page
39  Workload
NODE LISTING

Nodes in Set: All Tree Nodes
Created: 18/05/2004 - 2:45:12 PM
Modified: 18/05/2004 - 2:45:12 PM
Number of Nodes: 34
1 (1) /Influence on decision to develop online
2 (1 1) /Influence on decision to develop online/Directive to develop online
3 (1 2) /Influence on decision to develop online/Influence of colleague
4 (1 3) /Influence on decision to develop online/Student demand
5 (2) /Influence on decision to develop online/Faculty policies
6 (3) /Faculty policies/Faculty policy- dialogue
7 (3 1) /Faculty policies/Faculty policy- experimenting
8 (3 2) /Faculty policies/Faculty policy- lagging behind
10 (4) /Change
11 (4 1) /Change/Change - gradual
12 (5) /WebCT
13 (5 1) /WebCT/Views - WebCT
14 (5 2) /WebCT/WebCT - planning
15 (5 3) /WebCT/WebCT - use
16 (5 4) /WebCT/WebCT- advantages for staff
17 (5 5) /WebCT/WebCT- flexibility
18 (5 6) /WebCT/WebCT-Discussion groups
19 (6) /Training & Skills
20 (6 1) /Training & Skills/Training & Skills - Exposure
21 (6 2) /Training & Skills/Training & Skills - faculty
22 (6 3) /Training & Skills/Training & Skills - informal
23 (6 4) /Training & Skills/Training & Skills - from CeLTS
24 (6 5) /Training & Skills/Training & Skills - from ITS
25 (6 6) /Training & Skills/Training & Skills - Ideal
26 (6 7) /Training & Skills/Training & Skills - networks
27 (6 8) /Training & Skills/Training & Skills - On demand
28 (6 9) /Training & Skills/Training & Skills - self
29 (6 10) /Training & Skills/Workshop
30 (7) /Time
31 (7 1) /Time/Time - Admin
32 (7 2) /Time/Time - Research
33 (7 3) /Time/Time - Teaching
34 (7 4) /Time/Time - Developing resources
Appendix 6  Elective 1: Ethics papers

DEAKIN UNIVERSITY ETHICS COMMITTEE

CONSENT FORM: Participation

I, of

Hereby consent to be a subject of a human research study to be undertaken by Gayani Samarawickrema

I have read the Statement for Participants relevant to this research study and the sample of questions attached to this form that would be the basis of the interview. I understand that the purpose of the research is to examine how the role of the educational designer has changed with the increased use of computer mediated communication in subjects taught through flexible learning. I understand this study will explore the lecturer or academic subject specialist-educational designer relationship in developing on-line teaching and learning materials for flexible delivery. The findings of this study, I believe, will be useful in better understanding the perceptions and expectations of the educational designer role.

I acknowledge

1. That the aims, methods, and anticipated benefits, and possible risks/hazards of the research study, have been explained to me and that I have read the attached sample questions.

2. That I voluntarily and freely give my consent to my participation in such research study.

3. I understand that aggregated results will be used for research purposes and may be reported in scientific and academic journals.

4. Individual results will not be released to any person except at my request and on my authorisation.

5. That I am free to withdraw my consent at any time during the study, in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Signature: Date:

Should you have any concerns about the conduct of this research project, please contact the Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123).
DEAKIN UNIVERSITY ETHICS COMMITTEE

PLAIN LANGUAGE STATEMENT FOR PARTICIPANTS

Date:

Project Title: On-line learning and its impact on the role of educational designers

I am Gayani Samarawickrema, a student of Deakin University, reading for an EdD. A research project is part of a folio of this study programme. This study is undertaken under the supervision of Dr Elizabeth Stacey, a senior lecturer in the School of Scientific and Developmental Studies of the Faculty of Education, Deakin University.

The aim of this study is to examine how the role of the educational designer has changed with the increased use of computer mediated communication in subjects taught through flexible delivery. This study will explore the lecturer-educational designer relationship in developing on-line teaching and learning materials for flexible delivery. The findings of this study, will be useful in better understanding the perceptions and expectations of the educational designer role.

I am seeking Monash University academics - educational designers who have recently designed and developed flexible learning material and lecturers who have incorporated on-line technologies in their teaching, who will be prepared to be interviewed by me. The interview will take about 45-60 minutes when your opinion will be sought on your expectations and the assistance you received from educational designers when you recently developed your subject for flexible learning. The interview will be audio taped, transcribed and transcripts sent to you for any additions, corrections you wish to make prior to my analysis.

Attached to your consent form are samples of questions I wish to pose to educational designers and lecturers. These questions will be the basis of the interview.

No findings will be published which could identify you as an individual participant and anonymity is assured. Access to data will be restricted to myself and my supervisor and the data will be stored for six years, as prescribed by university regulations.

Participation in this research is entirely voluntary and the questions attached to the consent form will help you decide if you would like to participate. You may wish to withdraw your consent to participate at any time, or decline to participate in any section of the study by not responding.

If you have queries or would like further information, please contact me on telephone (03)9903 239.

Thank you.

Gayani Samarawickrema

Should you have any concerns about the conduct of this research project, please contact: The Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123). Or Dr Elizabeth Stacey, (Supervisor), Faculty of Education, Deakin University, 221 Burwood Highway, Burwood VIC 3125 Tel (03) 9244 6443 Fax (03) 9244 6834 Email -estacey@deakin.edu.au
Appendix 7  
Elective 1: Interview questions

Following is a list of questions/areas the interviews covered that were submitted to the Deakin University Ethics Committee.

Sample Questions for educational designers

What changes do you see in the nature of your job caused by the increased use of on-line technologies?

How do you see your role in relation to technology adoption and use?

What are the new and different requests academic staff make from you related to technology use in teaching flexibly?

What pressures do you have from academic staff who are new to the use of online technologies?

What type of assistance is sought from academics, and how relevant/justifiable is this?

To what degree do you assist them? How much of their requests can you satisfy?

Ability/inability to provide the requested assistance, with reasons.

How and where did you learn the skills to develop flexible learning materials incorporating on-line technologies?

What is the type of professional development support you have to keep pace with change?

What factors/reasons do you consider, contribute to the success/impede the development of quality technology based material?

Questions to the Head, Educational Design

Comment on the use of online technologies and the impact on educational design workloads (as someone managing workloads).

What misconceptions do you see among teaching academics of educational designers’ work practices?

Professional development requirements for educational designers working in new environments.

What changes are required in policy and procedures?
Future directions?

Questions to the Special Advisor on Technology to the Deputy Vice Chancellor

Explain the vision for an e-Monash.

How do you ensure that educationally sound uses of technology are developed?

How do you ensure a coordinated approach to technology use in learning? What strategies are in place for such an approach?

How do you see staff development fit into this big plan?

How do you see the role of central units like CeLTS support the vision for an e-Monash?

How do you see CeLTS fulfilling its responsibilities?

What sorts of new roles and skills do you think are relevant in order to support the technological changes that are happening within Monash?

What is it like to manage IT based strategic change in a university at times such as these?

Describe IT management structures and processes and any approaches to evaluating IT investments and processes.
Appendix 8  
Elective 2: Ethics papers

DEAKIN UNIVERSITY ETHICS COMMITTEE

CONSENT FORM: Participation

I,                              of

Hereby consent to be a subject of a human research study to be undertaken by Gayani Samarawickrema.

I have read the Statement for Participants relevant to this research study, and I understand that the purpose of the research is to explore the strengths and weaknesses of VCO1403 Design Studio 1 in its adoption to flexible learning mode. The study will also examine how well it facilitated learning in a cross-cultural context and if the material was culture-sensitive.

The findings of this study, I believe, would be useful in better understanding the design and development of flexible learning material for cross-cultural audiences.

I acknowledge

1. That the aims, methods, and anticipated benefits, and possible risks/hazards of the research study, have been explained to me.

2. That I voluntarily and freely give my consent to my participation in such research study.

3. I understand that aggregated results will be used for research purposes and may be reported in scientific and academic journals.

4. Individual results will not be released to any person except at my request and on my authorisation.

5. That I am free to withdraw my consent at any time during the study, in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Signature:                                                                             Date:

Should you have any concerns about the conduct of this research project, please contact the Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123).
DEAKIN UNIVERSITY ETHICS COMMITTEE

PLAIN LANGUAGE STATEMENT FOR PARTICIPANTS

Date:

Project Title: Designing for Cross-Cultural Flexible Delivery

I am Gayani Samarawickrema, a student of Deakin University, reading for a professional doctorate in education (EdD). A research project is the basis of this study programme. The study is undertaken under the supervision of Dr Elizabeth Stacey, a senior lecturer in the School of Scientific and Developmental Studies of the Faculty of Education, Deakin University. The EdD requires that the project relates/links to one's professional activities and this one usefully links to my professional activity as I was responsible for the educational design of this subject.

The aim of this study is to explore the strengths and weaknesses of VCO1403 Design Studio 1, a first year undergraduate subject of the Faculty of Art and Design, Monash University, in its adoption to flexible learning mode. The study will also examine whether the material was designed suitably for students coming from overseas. The findings of this study, I believe, would be useful in better understanding the design and development of flexible learning material for local as well as overseas audiences.

I am seeking first year undergraduate students who will be enrolling in this subject to work through one topic or two weeks worth of material and respond to the activities of this topic. It will take one-two weeks to respond to the activities and the project in the material. Since you are already a student of VCO1403, this response will not be 'extra' work, except that you can chose to do it in your own time, instead of attending the regular class session. Being a researcher from a centre outside of the Faculty of Art and Design, I have no control or influence over your assessment of this subject.

This will be followed by a brief focus group interview (which will consist of 4-6 persons) should it be considered necessary to clarify any responses. All interviews will be audio taped, transcribed and transcripts sent to you for any additions and corrections you wish to make prior to my analysis.

No findings will be published which could identify you as an individual participant so that it will ensure your anonymity. Access to data will be restricted to myself and my supervisor and the data will be stored for six years, as prescribed by university regulations.

Participation in this study is entirely voluntary and you may wish to withdraw your consent to participate at any time, or decline to participate in any section of the study by not responding. If you wish to participate, please sign the consent form attached, and return it to me in the internal mail at the address below.

If you have any queries or would like further information, please contact me on telephone (03)99032339.

Thank you.

Gayani Samarawickrema
Centre for Learning and Teaching Support, Monash University, Caulfield Campus

Should you have any concerns about the conduct of this research project, please contact the Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123).
Appendix 9  Elective 2: Interview questions

The following is a list of questions/areas the interviews covered that were submitted to the Deakin University Ethics Committee.

Questions to local Australian students and international students:

How easy was it to work through the information?

Was the information provided in the material enough for you to work alone?

How clear were the instructions for the projects?

Would you recommend this subject to a friend to be taken as a DE subject?

In your opinion, do you think the subject should use new technologies?

In which way? Doing projects? Submitting projects? Communicating with staff and fellow students?

What was successful in the subject, what worked and what didn't?

What did you not like about the subject?

What did you like about the subject?

Questions to international student:

Would you recommend this subject to a friend back home in your country?

How would you describe it to that friend?

Do you think the subject has to be changed to be offered to your local setting?

If you agree, what changes would you suggest?

What sorts of persons do you believe would be interested in this subject?

What needs would they have and therefore this subject should satisfy?

What would they hope to get out of this subject?

Would they be able to use the internet, graphics packages?

What sorts of access to these resources would they have? Would they have computers at home, at their work places?
References


References


References


References


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