Rethinking a Learning Environment Strategy

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Forward

This folio reports my original work except as otherwise acknowledged in the text. The folio presentation has not been submitted either in part or in whole for a degree at this or any other university. The folio document is developed as one study consisting of a complementary collection of parts:

- an introduction and background survey of the research space i.e. the Information Technology, Systems and Multimedia (ITSM) Discipline at Swinburne University of Technology, Lilydale, Learning Environment (Chapters One and Two);
- descriptive meta analysis of the ITSM Discipline learning environment using peer reviewed publications (published professional writing) covering specific issues for the pedagogy and instructional design implementation, including the following papers;
  - Paper 2 – Application for Accreditation of Bachelor of Technology Programs, Prepared by Calway August 2001
  - Paper 4 - Students and Staff a Shared Learning Journey - Calway, in association with Assoc. Prof. Helen Paterson - 16th Australian International Education Conference, Hobart, Australia 2003. (Chapter Three)
- a dissertation (Chapter Four) for a specific issue relating to students’ learning approaches as a study of a learning skills inventory data collection, collected within the ITSM Discipline learning environment as implemented in 2002; and
- conclusions (Chapter Five) and further study opportunities.

A folio approach and an unobtrusive research methodology (Hernon & McClure 1987; Kellehear 1993) provide a series of lenses through which to view both the ITSM Discipline as a case and the wider issues of development of a higher education learning environment, particularly one that significantly utilises information and communication technologies and active learning theory.
Acknowledgements

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Abstract

I have committed a significant period of time (in my case five years) to the purpose development of learning environments, with the belief that it would improve the self-actualisation and self-motivation of students and teachers alike. I consider it important to record and measure performance as we progressed toward such an outcome.

Education researchers and practitioners alike, in the higher (university/tertiary) education systems, are seeking among new challenges to engage students and teachers in learning (James, 2001). However, studies to date show a confusing landscape littered with a multiplicity of interpretations and terms, successes and failures. As the discipline leader of the Information Technology, Systems and Multimedia (ITSM) Discipline, Swinburne University of Technology, Lilydale, I found myself struggling with this paradigm. I also found myself being torn between what presents as pragmatic student learning behaviour and the learner-centred\(^1\) teaching ideal reflected in the Swinburne Lilydale mission statement.

The research reported in this folio reflects my theory and practice as discipline leader of the ITSM Discipline and the resulting learning environment evolution during the period 1997/8 to 2003. The study adds to the material evidence of extant research through firstly, a meta analysis of the learning environment implemented by the ITSM Discipline as recorded in peer reviewed and published papers; and secondly, a content analysis of student learning approaches, conducted on data reported from a survey of ‘learning skills inventory’ originally conducted by the ITSM Discipline staff in 2002.

In 1997 information and communication technologies (ICT) were beginning to provide plausible means for electronic distribution of learning materials on a flexible and repeatable basis, and to provide answers to the imperative of learning materials distribution relating to an ITSM Discipline new course to begin in 1998. A very short time frame of three months was available prior to teaching the course. The ITSM

\(^{1}\) Learner-centred is taken to include a humanist, constructivist and liberal view of learning and teaching as documented by Swinburne University of Technology, Lilydale mission statement.
Discipline learning environment development was an evolutionary process I began in 1997/8 initially from the requirement to publish print-based learning guide materials for the new ITSM Discipline subjects. Learning materials and student-to-teacher reciprocal communication would then be delivered and distributed online as virtual learning guides and virtual lectures, over distance as well as maintaining classroom-based instruction design. Virtual here is used to describe the use of ICT and Internet-based approaches. No longer would it be necessary for students to attend classes simply to access lecture content, or fear missing out on vital information.

Assumptions I made as discipline leader for the ITSM Discipline included, firstly, that learning should be an active enterprise for the students, teachers and society; secondly, that each student comes to a learning environment with different learning expectations, learning skills and learning styles; and thirdly, that the provision of a holistic learning environment would encourage students to be self-actualising and self-motivated. Considerable reading of research and publications, as outlined in this folio, supported the update of these assumptions relative to teaching and learning.

ITSM Discipline staff were required to quickly and naturally change their teaching styles and communication of values to engage with the emergent ITSM Discipline learning environment and pedagogy, and each new teaching situation. From a student perspective such assumptions meant students needed to move from reliance upon teaching and prescriptive transmission of information to a self-motivated and more self-actualising and reflective set of strategies for learning.

In constructing this folio, after the introductory chapters, there are two distinct component parts;

- firstly, a Descriptive Meta analysis (Chapter Three) that draws together several of my peer reviewed professional writings and observations that document the progression of the ITSM Discipline learning environment evolution during the period 1997/8 to 2003. As the learning environment evolved, it became increasingly virtual and collaborative, with a focus on student self-motivation and self-actualisation.

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2 Self-actualising here is taken to mean – “the desire to become more and more what one is, to become everything that one is capable of becoming” Maslow first published in 1954, 2nd Ed. (1970); Norwood (1999).
environment designer and discipline leader, my observations and published papers provide insight into the considerations that are required when providing an active, flexible and multi-modal learning environment for students and teachers; and

- secondly, a Dissertation (Chapter Four), as a content analysis of a learning skills inventory data collection, collected by the ITSM Discipline in the 2002 Swinburne Lilydale academic year, where students were encouraged to complete reflective journal entries via the ITSM Discipline virtual learning guide subject web-site. That data collection included all students in a majority of subjects supported by the ITSM Discipline for both semesters one and two 2002. The original purpose of the journal entries was to have students reflectively involved in assessing their learning skills and approaches to learning. Such perceptions were tested using a well-known metric, the ‘learning skills inventory’ (Knowles, 1975), augmented with a short reflective learning approach narrative. The journal entries were used by teaching staff originally and then made available to researchers as a desensitised data in 2003 for statistical and content analysis relative to student learning skills and approaches.

The findings of my research support a view of the student and teacher enculturation\(^3\) as utilitarian,\(^4\) dependent and pragmatically self-motivated. This, I argue, shows little sign of abatement in the early part of the 21\(^{st}\) Century. My observation suggests that this is also independent of the pedagogical and educational philosophy debate or practice as currently presented. As much as the self-actualising, self-motivated learning environment can be justified philosophically, the findings observed from this research, reported in this folio, cannot. Part of the reason for this originates from the debate by educational

\(^3\) Enculturation - The process of a culture (one’s environment and all that it includes) shaping and influencing who we are and how we look at the world. (www.mhhe.com/mayfieldpub/kelly/chapter02/glossary.htm)

\(^4\) Utilitarian here is taken to include – Teacher-centred, behavioural, positivist, structural and functionalist considerations. (www.ciaonet.org/wps/gus06/gus06.pdf)
researchers as to the relative merits of liberal and vocational philosophies for education combined with the recent introduction of information and communication technologies, and commodification of higher education.

Challenging students to be participative and active learners, as proposed by educationalists Meyers and Jones (1993), i.e. self-motivated and self-actualising learners, has proved to be problematic. This, I will argue, will require a change to a variable/s (not yet identified) of higher education enculturation on multiple fronts, by students, teachers and society in order to bridge the gap. This research indicates that tertiary educators and educational researchers should stop thinking simplistically of constructivist and/or technology-enabled approaches, students learning choices and teachers teaching choices. Based on my research I argue for a far more holistic set of explanations of student and staff expectations and behaviour, and therefore pedagogy that supports those expectations.
Chapter One

Rethinking a Learning Environment Strategy

1.0 Introduction

The title for this research folio, and Chapter, gives an insight into my research findings, i.e. that something is wrong with the learning environment strategy that emanated from the Information Technology Systems and Multimedia (ITSM) Discipline, at Swinburne University of Technology, Lilydale. The ITSM Discipline learning environment evolved and was implemented during the period 1997/8 to 2003, the period during which I was leader of the ITSM Discipline. I was also the designer of the ITSM Discipline learning environment.

In this chapter I will provide an outline of the folio, background the research reported, and present a synopsis of the total folio – drawing together the various component parts of the research. The research is framed within the changing Australian higher education, political, economic and technology paradigms between 1997/8 and 2002.

1.1 Drivers for Change

There are four drivers that I identify as change agents relative to the learning environment evolution of the ITSM Discipline:

- Australian higher education reform (Section 1.1.1 below);
- learner-centred and liberal learning philosophy (Section 1.1.2 below);
- information and communication technologies and globalised economies (Section 1.1.3 below), and
- the Swinburne Lilydale mission statement (Section 1.1.4 below).
In a climate of higher educational reform – as Kemp (1998); James (2001); and Nelson (2002), variously point out:

- education reform must favour a vocational and performance focus, as well as desiring a life-long and learner-centred learning paradigm;
- educationalists should espouse a shift from instructive transmissive thinking towards higher-order constructivist thinking and liberal learning paradigms;
- education paradigms should account for a globalised economic, communication and information technology environment;
- education commodification and rationalisation act to provide opportunity at post compulsory levels; and
- education is to be provided in flexible and multi-modal forms.

### 1.1.1 Politics of a Changed Education System in Australia

In 1997/8, when the ITSM Discipline learning environment was initiated, there was an education transition occurring. The Australian Government address titled ‘Strategic Developments in Higher Education’ prepared by the then Minister for Education, Dr David Kemp (1998). In that address Dr Kemp outlined the basis for undergraduate education as a life-long learning foundation. He said:

It is critical that undergraduate education is fully effective as a foundation for life-long learning. I commend the ‘West committee’s’ effort to construct a statement of attributes, or learning outcomes, expected of first degree graduates. The committee expresses these in the following terms:

- *the capacity for critical, conceptual and reflective thinking in all aspects of intellectual and practical activity;*
- *technical competence and an understanding of the broad conceptual and theoretical elements of his or her fields of specialisation;*
• intellectual openness and curiosity, and an appreciation of the interconnectedness, and areas of uncertainty, in current human knowledge;
• effective communication skills in all domains (reading, writing, speaking and listening);
• research, discovery and information retrieval skills and a general capacity to use information;
• multifaceted problem solving skills and the capacity for team work; and
• high ethical standards in personal and professional life, underpinned by a capacity for self-directed activity.

Dr Kemp outlined a deliberate strategy for countering the previous Government’s emphasis upon “competency-based” frameworks for curriculum matters, instead focussing on an unpredictable future which will “… give greater weight to the broad development of personal potential, integrative abilities and values than to acquisition of specialised knowledge and skills.” Kemp further suggested that the West committee put emphasis upon student-centric (not learner-centric) education processes, that is, student as ‘customer’. Such emphasis would require considerable rethinking of curriculum and instructional design.

In 2002, the new Minister for Education, Dr Brendan Nelson, re-stated the purpose of higher education. In his paper, Dr Nelson (2002) stated the nature of this purpose as:

Higher education fulfils significant functions in our society. It values learning throughout life. It promotes the pursuit, preservation and transmission of knowledge. It extols the value of research, both ‘curiosity-driven’ and ‘use-inspired’. It enables personal intellectual autonomy and development. It provides skills formation and educational qualifications to prepare individuals for the workforce. It helps position Australia internationally. (para. 2)
Further Dr Nelson argued that:

The Government sees the purpose of higher education as much greater than preparing students for jobs. It regards higher education as contributing to the fulfilment of human and societal potential, the advancement of knowledge and social and economic progress. The main purposes of Australian higher education are to:

- inspire and enable individuals to develop their capabilities to the highest potential;
- enable individuals to learn throughout their lives (for personal growth and fulfilment, for effective participation in the workforce and for constructive contributions to society);
- advance knowledge and understanding; and
- aid the application of knowledge and understanding to the benefit of the economy and society.

The above suggests that Australian society, industries and institutions of education will develop coherent conceptions of what is expected of quality higher education as a social norm and consequently what teaching and learning constitute within that normalisation. However, how these are to be achieved is not considered. Certainly consumer focus and transference of competency focused knowledge and skills loom large, as do outcomes in the form of degrees, graded subject results, graduate attributes and the like.

Social commentators such as James (2001) were quick to point out a different reality from that espoused in the Australian Government policy. He took particular issue with student-centred education:

Many believe a consumerist pattern of thinking among students, which they believe is a direct result of the expectation that students contribute a greater proportion of the cost of their education, is now emerging during their day-to-day interaction with students. They offer anecdotal reports
of students expecting the right to play a more passive role in their learning and, in isolated instances, of students being heard to make direct references to the cost to them of particular course components.

Academic staff are puzzled and worried by what they perceive to be the rapidly changing character of student expectations. Unfortunately, the staff prognosis is often pessimistic. *Many believe a greater proportion of students are predominantly instrumental, seek greater spoon-feeding and narrowly reproductive approaches to assessment, and are generally more likely to judge the quality of teaching in terms of ‘value for money’.* *Staff also believe there is a sharpening distinction between ‘achievers’ and the students who simply wish to do the minimum work to achieve a pass standard*, resulting in increasingly bi-modal grade distributions.

Academic staff are especially concerned when student expectations are poorly aligned with their core academic values. Most academic staff have a strong professional commitment to ‘making a difference’, have a clear vision of the educational outcomes they wish to teach towards and the abilities they wish to assess. Many presently feel frustrated in their efforts to do so. While there is a tendency for academics to conclude that students are seeking effort-free qualifications and threatening the quality of higher education as we once knew it, such a gloomy outlook is probably unjustified — students undertaking part-time employment, for instance, may be earning essential income for meeting the financial costs of undertaking higher education and while doing so they may be developing valuable generic skills as well as opening up graduate career options — and more sophisticated explanations of the nature and origins of student expectations are necessary. (*emphasis mine*)

The above dichotomy (i.e. between James and others and the Government) provides a paradigm that is confusing when approaching learning and teaching for tertiary education, the case when you have competing discourses.
1.1.2 Learner-Centred and Liberal Pedagogical Philosophies

Barr and Tagg (1995) argued that there was a paradigm shift taking hold in higher education (they were referring to United States of America) i.e. where a college existed to provide instruction previously, the new paradigm was an institution that exists to produce learning. They were commenting upon the learner-centred approach that had permeated higher education institutions and academic thinking for over a decade.

When I was designing and implementing the ITSM Discipline learning environment, Swinburne Lilydale was to be viewed as learner-centred on the grounds that its mission statement was connected with liberal education, where a liberal arts curriculum is integrated into undergraduate courses. Within Swinburne Lilydale this is achieved through multiple disciplines cooperating within a single division of the University (e.g. Marketing, Information Technology, Social Sciences, Media, Management, Economics, Law, Tourism and more). Students can choose and are encouraged to choose studies outside their ‘home’ (major) discipline. This was combined with four compulsory subjects as a liberal core: namely, Information Methods, Statistics, Learning & Communication and Science & Technology.

A great many of Swinburne Lilydale staff are actively involved in the delivery of the above policies and are actively involved in implementing them. Indeed, most could describe the learner-centred and liberal pedagogical basis of the learning and teaching strategies being implemented at Swinburne Lilydale. The unit envisioned a liberal and constructivist approach to learning that has a premise that learners should reflect on their extant knowledge and construct their own new world-views. This view is constructed in terms of the development of new knowledge and experience.

A constructivist learning sense is a process of modifying mental models to accommodate new or similar experiences (e.g. Bereiter & Scardamalia, 1996). This world-view is codified as a set of rules or norms that provide a mental model that we can apply to ‘make sense’ of our own experience. A significant element of the constructivist model requires that individuals understand as parts or as a whole what constitutes their world-view. The assertion here is that without understanding there
would be a dismissive ignorance and naïve engagement with the world that is being considered. Once again the positions are stated ideals but not the practices necessary to implement such positions.

1.1.3 Learning with Information and Communication Technologies

ICT provided a dominant driver for changing the ITSM Discipline instructional design, as it existed in 1997. Flexible and multi-modal learning materials provision was foundational to the establishment of the Swinburne Lilydale learning vision. As a result of changes in technology and leadership in 1997, these offered the significant redevelopment point of the ITSM Discipline courses and curriculum, and with pressures of publication of print-based materials, information and communications technologies provided the ideal first motivation for creating the ITSM Discipline instructional environment model.

Information and communication technologies, it could be argued, provide a formative revolution similar to that of printing technologies of the 16th through to the 20th centuries. The confluence of personal computers with sufficient capacity and online or Internet based telecommunications has enabled novel flexible learning approaches to be considered. Such facilities are proliferating through learning management systems (e.g. WebCT, Blackboard, Learning Space, Elegant Solution) and are being globalised rapidly. However, it could be argued that such technologies are not without precedent in learning and teaching, or without problems. Information literacy and technology access problems can be envisioned as those that were true in the fifteenth and sixteenth centuries with the introduction of printing and the print-based dissemination of extant knowledge.

In terms of social change as enculturation, it is useful as a metaphor to consider the introduction of moving type printing. With printing and the printed texts came the increased spread of knowledge. Current global and high-speed digital communication and the Internet have encouraged a similar spread of knowledge in the 21st Century but the latter is accumulating at a substantially greater rate than printed material (approximately 15 years verses 250 years). While there are many differences from printing as a technology there are also some social parallels.
Acquisition of print-based materials often depended upon knowing of its existence and purchasing it or visiting the relevant storage area, usually a library, in order to access the specific knowledge. Many constraints on print-based publications have been obviated through computer-based or digital storage and communication via global telecommunications. There were of course many accompanying innovations to assist knowledge acquisition and learning when using print-based materials, e.g. library catalogues.

Certainly the spread of online computer-based materials during the last 30 years has been extensive, as has the volume of materials digitally available via the Internet. However, it was only in the last decade that the proliferation of materials and the availability of search techniques have granted an equally exponential growth in computer-based publication and global access to knowledge from desk top workstations.

As with moving type and print-based materials there are issues of distribution and more importantly literacy, not literacy as in traditional print-based materials but computer and information literacy for reading and writing online using learning ICT systems. It took many centuries for much of the world’s population to be able to procure and use printed materials and it is only in the last century that we have seen the commodification of print-based materials. However, even today, five centuries on, there is a significant portion of the world’s population who still cannot read or have access to printed materials and therefore the educative disadvantage that brings (ref http://www.worldbank.org/data/wdi2004/worldview.htm) (last accessed 2004).

It has taken several decades for the proliferation of personal computers and global telecommunications, with computer ownership and access to high-speed digital telecommunications still very low worldwide and computer literacy still confined mostly to developed countries and higher education institutions.

It is not the purpose of the present study to argue for or against a learner-centric, teaching-centric, liberal, instructivist, constructivist or any other approach to learning; rather, it is to use the accepted mission of Swinburne Lilydale and elaborate the online and active learning paradigms that form the basis of the ITSM Discipline
learning environment. Unfortunately, a proliferation of studies and literature across all continents means that any extensive analysis is neither plausible nor possible if only because of the number of languages and contexts in which publications exist. Sufficient to say that learner-centric pedagogy is a worldwide experience with much study needed before any single effective methodology can be cast. A synopsis of related literature and studies is contained in Chapter Two.

1.1.4 Swinburne Lilydale Mission Statement

From the formation of Swinburne Lilydale and the outset of the ITSM Discipline in 1997/8 I, as discipline leader, the staff and students have been directed on a road of change from a traditional teacher-centred approach to that of a learner-centred constructivist and ICT based learning approach. The ITSM Discipline staff could no longer continue with the old model of teaching and learning because the new Swinburne Lilydale mission was to be both learner-centred and technology enabled learning. The following extracts from University documents provide the origin of the mission:

The Swinburne University of Technology Act of 1992 embeds the University’s purpose:

The Parliament of Victoria enacts as follows:

1. Purpose

The purpose of this Act is to establish the Swinburne University of Technology, to improve access to university education in the Outer Eastern region of Melbourne and to provide for the merger with the University of Swinburne Institute of Technology, Swinburne College of Technical and Further Education and Prahran College of Technical and Further Education.

2. Objects of the University

The object of the University includes-

(a) the development of an institution with excellence in teaching, training, scholarship, research, consultancy, community service and
other educational services and products, with emphasis on technology and its development, impact and application …

The Swinburne Lilydale mission statement is a significant influence on the ITSM Discipline learning environment construction. It states:

Swinburne, Lilydale’s mission is to inspire and assist individuals to develop their capabilities to the highest potential for personal growth and fulfilment, and for effective participation in the community; to advance, and to further the application of knowledge and understanding for the benefit of society.

and

The Swinburne, Lilydale community is committed to:

- … An holistic approach to education in a culture that encourages scholarship, critical inquiry, a plurality of views, respect for diversity, creativity, initiative and care of our environment.
- A community and cooperative approach to experiential learning and education.
- … Building on the university’s well-established tradition of industry-based and work-integrated learning and encouraging collaborative links to enhance the value of our students to business, industry, public services and in other activities. Furthering this through providing students with a balance of liberal arts and vocational and professional disciplines.
- Encouraging a spirit of adventure in discipline-based scholarship, collegiality, creativity, innovation and academic pursuits.
- Exploring and challenging the boundaries, both educational and commercial, of cyberspace and virtual communities.
1.2 My Personal Profile

It is of some value to describe my background in relation to the research given the subjective and interpretive nature of the folio. I entered academia in 1991 from a 20 year career in business, manufacturing, information systems design and development. I completed postgraduate studies in management information systems, a Masters degree in business information technology and a Doctor of Philosophy in information systems, and I am currently undertaking research in virtual learning environments. I have published extensively in aspects of vocational education, information systems development and requirements elicitation. I was formerly Principal Lecturer and Discipline Leader Information Technology, Systems and Multimedia for Swinburne University of Technology, Lilydale 1997/2003. Now I am Director for the Centre for eBusiness and Communication, and Director for the Centre for electronic Financial Services. I am a researcher in eLearning, Learning Communities, Corporate Knowledge Management and Information Requirements & Knowledge Object Development. I am the Senior Editor (International) for the Journal for Cooperative Education and Internship. I am a member of the Editorial Board for the Industry and Higher Education Journal, and an Associate Editor for the Australian Conference on Information Systems. I am a member of the World Association for Cooperative Education and a member of the Australian Computer Society.

In 1997 I was appointed to the role of Discipline Leader for the Information Technology, Systems and Multimedia academics. At that time there were three full-time academics and multiple sessional (part-time) tutors with responsibilities for a series of computing science and information systems subjects and a first year core information methods subject. During the ensuing five years the profile of staff changed, as did the focus of the undergraduate courses. The Bachelor of Technology programs I designed were the culmination of a move from computer science towards enterprise engineering and multimedia as the driving influences upon business degrees and more generally society.
I implemented, as a first step, a file transfer protocol for dispensing electronically the word processed files of 1997/8. This was a predecessor to distribution of learning materials using the Internet in 1998. Subsequently I experimented with several learning management systems before settling upon WebCT as the preferred learning management system. I tried to use the skills of my information systems discipline knowledge to influence the development of the learning environment and learning materials delivery. Prior to becoming Discipline Leader I had spent two decades developing information systems for businesses and industries, and so learning seemed to be a logical extension.

1.3 Study Motivation and Objectives

For all of the 1990s I spent considerable time investigating teaching and learning approaches, ultimately adopting the constructivist and ‘Active Learning’ theory of Meyers and Jones (1993) as best fitting who I was as a teacher and learner. It also enabled me to represent work-integrated and problem-based learning into the ITSM Discipline learning environment pedagogy.

As mentioned earlier Dr Kemp (1998) saw performance outcomes as critical for higher education and put in place many performance related criteria and mechanisms for measuring and rewarding performance. I had observed (at the close of 2002 when I moved from being the ITSM Discipline leader) that the ITSM Discipline learning environment remained problematic for teaching staff and under utilised by students. This was in spite of the flexible study freedoms and matured multimodal learning technologies available to them.

My original premise was that the ITSM Discipline learning environment would lead to a greater self-directedness and self-motivation to the point of self-actualisation for students and teachers. At the close of my time as ITSM Discipline leader it was reasonable to reflect on the progress of this model. I wanted to know whether it had made any difference in the student’s learning approaches and teachers’ teaching approaches.
Therefore in particular I was eager to explore what, if anything, could be learnt from the ITSM Discipline learning environment model enculturation. I had expected students, post 2000 enrolment, would be positively predisposed to change learning approaches from utilitarian to self-actualising as a result of the application of active learning and the application of information and communication technologies.

I say post 2000 enrolments because up to that point there was little stability in the ITSM Discipline learning environment development. The ITSM Discipline was going through, all at once, substantial change with the introduction of a new pedagogy and learning management system, virtual learning guides, virtual lectures, and a new undergraduate degree curriculum for the ITSM Discipline.

My suspicion was that the ITSM Discipline learning environment remained problematic by the close of my turn as Discipline Leader, with strong indications that, while the learning environment was flexible and constructively focused, that students were not moving above a minimalist and pragmatic learning approach. There was no sign of progress toward a self-actualisation and self-motivation outcome that was the purpose of the learning environment development in the first place.

### 1.4 Folio Reporting Conceptual Framework

The research reported in this folio, as two parts, builds upon extant knowledge by descriptively reporting firstly, a meta analysis of the ITSM Discipline learning environment construction and secondly, a dissertation investigating the learning approaches of a population of students in semesters one and two of 2002. The ITSM Discipline staff implemented a reflective journal as part of subject learning materials, which was designed to provide learning skills analysis and guidance to students, to ‘awaken’ them to their role in the learning process.

The folio dissertation explores in some detail the reflective journals of the students to see if they reveal any insights into the learning approaches of the students and whether any difference had been made in moving students from a content and instrumental model of leaning towards a constructive and active model.
1.5 Folio Methodology and Research Structure

The research presented in this folio takes the position of unobtrusive research (Hernon & McClure, 1987; Kellehear, 1993). This approach is non-reactive where the researcher does not become a part of the study per se. As the researcher I examine already available evidences and draw conclusions from such evidence. One particular form of unobtrusive research is content analysis (detailed in Chapter Four) where I analyse a data collection from a ‘student learning skills inventory’.

Unobtrusive research is a qualitative method and by its very nature looks to extant documents such as memos, published papers, personal journals and diaries and the like. This is appropriate given that the informing question of the folio is more to do with ‘what?’, ‘who?’ and ‘how?’ rather than ‘why?’. The what and how questions require me to access internal experiences of the field of study. It has proven difficult to identify the variable(s) in advance because I did not know the extent of the area or phenomenon under study until I perceived the data relationships. The phenomenon identified in Chapter Three of the folio is that students present as ‘pragmatic learners’ (sometimes strategic) and that a study of student learning approaches could be of benefit in maintaining the ITSM Discipline learning environment.

The overarching methods for this research deal with experiential data rather than experimental data. This is an interpretive and constructivist framework where reality or phenomena emphasise my individual subjective experience. Tesch (1990), Denzin and Lincoln (1994) and Mertens (1997) all point to individuals (as researchers) trying to understand their experiences and consequently informing their decision processes; i.e., the subjective experience is at the core of the enquiry.

The folio is constructed using a collection of my observations and professional writings reporting the period from 1997/8 to 2003 of the ITSM Discipline learning environment, and a Dissertation. The structure is:

Chapter One – Introduction to the study, motivation and conceptual focus, objectives and plan, and folio structure.
Chapter Two – Investigates the background material and definitions for the folio. Key literature is reviewed, and critiqued where required, and related works are investigated.

The folio then moves to reporting the study as two distinct although complementary parts:

Firstly Part I – A qualitative meta analysis of the ITSM Discipline learning environment construction, models and procedures including Professional Writing and Practice as:

- Chapter Three (ITSM Discipline Learning Environment Construction) – Provides a peer reviewed collection of my professional writings relating to my research interest in the ITSM Discipline and the core issues that emerge around it incorporated as part of the meta analysis of the ITSM Discipline learning environment. The review data cover a period of five years of the ITSM Discipline learning environment evolution. The chapter discusses models, theory and practice, the environment of systems including the various interaction of learning management systems, degree development and online/virtual learning environment.

Secondly Part II – a Dissertation as:

- Chapter Four (Dissertation - Methodology, Research Design and Analysis) - Details the construction, methodology and analysis of the original collection of data at the start (week one) of each of semesters one and two of the year 2002. The students’ learning skills inventory and approach perceptions are classified and analysed as an exploratory statistical and content analysis.
Lastly the folio summary and conclusion as:

- Chapter Five – (Study conclusion and summary) draws the work to a point of finality with areas for future research and investigation highlighted. The various analyses and findings are summarised with a mind to providing observations for all those undertaking curriculum development, flexible and multi-modal learning environment initiatives.

1.6 Summary

Within the ITSM Discipline my aim was to design a learning environment that captured qualities such as disciplinary and interdisciplinary accuracy, social relevance, and contextual and critical thinking in both staff and students. The resultant ITSM Discipline learning environment meta analysis and the dissertation constitute the substance of this research folio.

The study discusses that there is in reality ‘no significant difference’ created in the learning approaches of students and teachers; however, there is a change in the timing of study and where that study now takes place. Regardless of the efforts to provide a holistic and conducive, active and ICT based, learning environment the students remain outcomes focused. This is not an option that sits well with my learning environment design purpose and outcomes, but an option none the less.

There seems a distinct lack of understanding and consistent study available to the majority of academics about the learning and teaching paradigms and the transition in education of both pedagogy and ICT instructional design. Also there is a distinct Government higher education model that firstly focuses upon the student-centeredness ‘student as customer’ and that secondly reinforces a vocational understanding of learning – development of knowledge and skills that are relevant to the individual, employer, professional associations, labour markets and society.

Equally, a significant Government and Swinburne Lilydale institutional imperative is the use of computer-mediated learning environments as a vehicle for flexible and
multi-modal learning materials distribution and the concept of virtual classrooms, lectures and guides. James (2001) points to the need to move from a superficial to a deeper understanding and explanation of the nature and origins of student learning expectations. Students may well be expressing pragmatic and strategic reproductive approaches but is this a reaction to environmental and agency imperatives such as a commodified vocational focus of education as one example, and/or part-time work in order to meet education costs or similar and therefore a need to be expeditious with time and resources as another example?
Chapter Two

Background, Literature Review and Related Work

2.0 Introduction

Between 1997/8 and 2002 I, as the ITSM Discipline leader, and the ITSM Discipline staff developed a new learning environment in accordance with Swinburne Lilydale’s learning and teaching mission statement, Active Learning theory and use of ICT. When founded in 1996 Swinburne Lilydale was forged on a confluence of elements; i.e. an outer or regional campus, an autonomous Swinburne division, multi-disciplinary (12 major disciplines), undergraduate focus only and a teaching campus with no higher degrees by research. The significant foundations of the ITSM Discipline learning environment include: the use of information and communication technologies, in particular the Internet and learning management systems, virtual classes and virtual lectures; application of the Meyers and Jones ‘Active learning’ paradigm (Meyers & Jones 1993); and learner-centred, liberal and constructivist principles. These were enacted with the purpose of supporting students and staff to become self-motivated and self-actualising.

The following sections augment with reviewed literature and related works the foundations of the ITSM Discipline learning environment conceptual framework, developed in later chapters.

The timeline and major actions in the evolution of the ITSM Discipline learning environment were:

- 1997/8 – Design of new undergraduate bachelors program BAppSci(IT). This was a move away from a traditional computer science focus and towards ICT application and software engineering. There was a strong emphasis in the ITSM Discipline on providing opportunities for students of
non-technical degree programs within Swinburne Lilydale (e.g. BBus, BSocSci);

- 1998 – Removal of print-based learning materials and replacement with online (virtual) learning guides and lectures. Initial online delivery of learning guides using file transfer approaches and subsequently using learning management systems;
- 1999 – Experimentation and initial application of learning management systems integrated with the Internet as a materials delivery vehicle;
- 2000 – Development of the ITSM Discipline learning environment template by drawing together the various instructional design, pedagogical and technological elements that were previously maintained as separate components. The learning template was operationalised using the early generations of WebCT (a proprietary learning management system) and remains as the basis to this day (2005);
- 2002 – Reflective journals introduced, with the express aim of having students and academics consider their learning and teaching approaches. An elaborated ‘learning skills inventory’ (Knowles 1975) was conducted during the first week of semesters one and two; and
- 2003 – Handover of the ITSM Discipline to another leader, therefore taking my day-to-day involvement away.

The context (i.e. ITSM Discipline learning environment) and conceptual (i.e. learning theory and practice) elements of the folio are inseparable owing to the complex enculturation of the study that is being recorded in this folio. As stated it is not the purpose of this study to isolate any one element in terms of analysing causality, nor is the purpose to propose new theory. Rather the study records the infusion of many theories and concepts into a singular novel application and learning pedagogy, policy, and technologies, for both students and staff as a learning community, i.e. the (ITSM) Discipline, Swinburne Lilydale.
2.1 Pedagogy - The Philosophy in Instructional Design Choices

The recent rapid change in society, and particularly in the attitudes toward the provision of higher education, has brought vast new challenges to universities (McInnes 2001). Prominent among them is the need to review and revamp ‘traditional’ forms of pedagogy to meet the needs of a varied and varying student body. It was no longer considered it acceptable to simply ‘transmit’ information as a stimulus approach, nor realistic to assume that learners would be willing or able to physically come to the campus for all their instruction due to a changing study demographic (McInnes & Hartley 2002).

As Welch (1998) points out:

Traditional forms of pedagogy in higher education … face challenges from two principal quarters, one of which is new modes of “virtual” pedagogy that may yet produce a more collaborative teaching relationship (the so-called guide on the side) over the traditional mode of pedagogy (the so-called sage on the stage). … A second challenge to the traditional dominance of universities is the increasing diversification of education and training, much of which now is taking place outside traditional settings. (Welch 1998, p. 2)

Welch also argues that:

Internationally, the fault lines of an uncertain future are becoming increasingly evident among academics at the end of the twentieth century, as the profession faces a number of substantial challenges, for which it is not entirely well prepared. Not only is the pace at which knowledge changes accelerating - accompanied by a substantial increase in the literature the professoriate must assimilate in order to stay current in their field - but the very idea of certainty in relation to knowledge is itself under increasing attack, particularly from those who relativise knowledge. Moreover, the transition in many systems from elite to mass higher education - which has raised expectations that curricula and
Chapter 2

Pedagogy be adapted to a more socially comprehensive cohort - is occurring during a period of substantial decline in government funding. In many universities, this trend has led to substantial retrenchments, significant privatisation, a precipitous decline in academic salary relativities, and heightened perceptions of uncertainty among academics. (Welch 1998, p.1)

There are two main thrusts to the drive to reform pedagogy in higher education. The first, and more longstanding, is to increase the level of constructivist pedagogy that takes place in universities, and the second is to develop a pedagogy that works within the increasingly important online instructional designs of higher education institutions. “Constructivism and the integration of technology in the curriculum may be the most recent trends in education relative to the dynamic relationship between how teachers teach and how children learn” (Lunenberg 1998, p.5). Inexorably constructivist pedagogy and ICT are linked in a single instructional design. To this end it is becoming increasingly obvious that the online learning environment dominates the context in which constructivist learning is surrounded by almost boundless information sources contained within learning management systems.

2.1.1 From Transmissive to Constructivist Pedagogy

When beginning my pedagogical understandings for the development of the ITSM Discipline learning environment there was no question of using other than a constructivist philosophy and constructive approaches to instructional design. Commentators such as Jaramillo (1996) promote the employment of new teaching frameworks through a renovation of pedagogy from that of a transmissive stimulus focused approach:

Those educators who adhere to behaviouristic, cognitivistic, and positivistic theoretical frameworks tend to instruct their students in a teacher-centred mode, whereas those who adhere to constructivism, collectivistic, and thematic holistic theories tend to teach students in a collective learning environment. The teaching strategies and curricula
that educators adopt implicitly reflect the learning theories that they advocate. (Jaramillo 1996, p.1)

Equally there is a proliferation of ‘copy cat teaching-as-telling’ tradition, particularly in higher education where lecturers are generally not required to undertake education and teaching qualifications. This form of proliferation sees the teacher at the centre of all communication where teaching is transmission of facts and stimulus responses because that is how they themselves were instructed at university. Jaramillo (1996) proposes that there are a number of features that distinguish constructivist pedagogy from traditional transmission pedagogy:

- …teachers should obtain knowledge about how students categorise their world, in order to devise interdisciplinary themes or schemata networks that correlate with the interests of students. (Jaramillo 1996, p.3);
- …teachers would likewise employ participant observations of student actions to inductively and deductively ascertain how informants derive meaning from their social settings. (Jaramillo 1996, p.3);
- …teachers must find middle ground between their decisions towards curricula development and individual student interests. (Jaramillo 1996, p.3);
- …the teacher employs modelling and scaffolding techniques at a level that parallels the learner’s zone of proximal development. Teachers activate this zone when they teach students concepts that are just above their current skills and knowledge level, which motivates them to excel beyond their current skills level. (Jaramillo 1996, p.4);
- …teachers must act as guides and set the conditions for students to successfully interact with their learning setting. To do this, educators must devise curricula that consists of adult knowledge and wisdom and lead the child to understand the former and
latter’s meaning in relation to the processes by which they were developed. (Jaramillo 1996, p.4);

- …the teacher’s goal is to convey his interpretation of his pre-existing social world (personal cosmology) to his students to enculturate them into their culture. (Jaramillo 1996, p.5);

- Teachers guide students to collectively devise methods to solve problems, while each child explains his thinking and simultaneously builds on the thinking of others. (Jaramillo 1996, p.5); and

- …teachers should seek to determine how students as individuals describe and identify themselves and their world through their own learning experiences. (Jaramillo 1996, p.5-6)

Olsen (1999) in his paper “Constructivist Principles of Learning and Teaching Methods” draws on the work of Brooks and Brooks (1993) to provide the following account of constructivist teaching practices:

These require the teacher to recognise and encourage student autonomy and leadership, encourage the use of "... raw data and primary sources, along with manipulative, interactive, and physical materials," (page 70) use the vocabulary of cognitive science such as predict, analyse, and classify in developing student activities, maximise student thinking and their use of instructional strategies, question students to identify" ... their theories about concepts before sharing your understandings of those concepts ...," (page 70) promote dialogue between students and between teachers and students, help students to elaborate their ideas, challenge students’ thinking by presenting contradictions to their ideas without demeaning them as persons, use wait-time after questioning students, promote inquiry by students through questioning them and having them question one another, provide time for student processing and thinking, encourage student reflection, design curriculum "... around conceptual clusters--of problems, questions, discrepant situations," (page 70) use curriculum at the students’ level of development, identify students
conceptions and misconceptions and develop lessons that respond to such immediately, and, for some tasks, group students by intellectual ability. (Olsen 1999, p.348)

Alternatively, Lunenberg (1998, p. 3) summarising the works of Brooks and Brooks (1993) proposed five principles of constructivist pedagogy:

1. Pose problems of emerging relevance to students
2. Structure learning around primary concepts
3. Seek and value student’s points of view
4. Adapt curriculum to address student’s suppositions
5. Assess student learning in the context of teaching

These formed the foundation of my thinking for the ITSM Discipline learning environment and were implemented using the Active Learning approaches of Meyers and Jones (1993), which will be discussed shortly.

Olsen further notes that “…constructivist principles when implemented will require extensive curriculum revision…” (Olsen 1999, p.348). Here Olsen draws on the work of Phye (1997) in claiming that the changes would require only a “…modification of teaching practices rather than sweeping change” (Olsen 1999, p.348).

The authors quoted in this section form a synthesis of my reading of key materials regarding higher education pedagogy, at the time of beginning the design process. They in no way cover the entirety of available literature; however, the authors synthesised here are well represented in the body of available literature and critique and therefore project the prevailing wisdom about effective pedagogy at this time.

At the beginning of my role as ITSM Discipline leader, I was led to believe that the implementation of ‘thoroughly’ constructivist pedagogy would allow for completely self-actualised learning on the part of the student and teacher that was inclusive of the teacher-guided experience that is advocated by all these authors. What follows is an up-to-date representation of the issues I grappled with then and to some extent grapple with now. In presenting the key themes and issues that lay at the heart of the
ITSM Discipline learning environment development it is important to locate my own theorising and practice within the wider literature.

2.1.2 Online (Virtual) Learning Materials

Online learning gives an excellent opportunity to foster high-order thinking skills, time management capabilities, interpersonal communication, and the capacity to process information. These strengths transcend disciplinary boundaries. This greater reach, however, requires greater interdisciplinary collaboration in the establishment and implementation of pedagogical goals (Benson & Wright 1999).

The establishment of a new online learning environment also requires a revisiting of current pedagogy. Cargile-Cook (2000) proposes a theoretical framework for the virtual environment based on the achievement by all students of “…six layered literacy--ethical, critical, rhetorical, social, technological, and formal or basic…” (Cargile-Cook 2000, p.107). She suggests that literacy be used to define the pedagogy, including course goals, activities and assessments.

Cargile-Cook reviews two online pedagogies, one described as presentational, and the other interactive:

The presentational design is most similar to traditional paper-based correspondence courses: materials are provided online; students work independently at their own pace to read these materials and complete assignments; and student/teacher interactions are restricted, for the most part, to student-initiated questions and teacher feedback on assignments. The interactive design, in contrast, employs three additional communication features--a bulletin board, a chat room, and peer evaluation software--in the course’s delivery mix. In the interactive design, students are required to interact with each other as well as with the instructor on a regular basis. Although students using the interactive design work at their own paces, their interactions with the instructor and other students create a learning environment similar to that of an onsite classroom. (Cargile-Cook 2000, p.108)
She notes that although both pedagogies were at least relatively effective and satisfied the participants, the interactive pedagogy was more successful in building ethical, social and critical understandings in the participants.

In designing pedagogy for the virtual learning environment an important question is whether the ITSM Discipline approach should be to modify existing material and practice or to create a new methodology. The literature seems to support the former. In the example discussed above the presentational design is representative of a ‘traditional’ pedagogy, whereas the interactive design has more effectively taken on the tools available to remodel the pedagogy. In the same article Cargile-Cook goes on to propose that teachers and instructional designers must, in the early stages of the planning and development of distance courses as an example, decide on a pedagogical foundation by which their instructional design and choices of technologies will be informed.

Similarly, Noss and Pachler (1999, p. 195; emphasis in original) argue that:

…while discussion of ICT is restricted to how to teach and learn, its real potential will remain limited. Similarly, viewing new technologies as merely an opportunity for faster or easier access to information will severely restrict the opportunities for positive educational change and may even bring about change in the wrong direction.

Noss and Pachler argue that the current application of technology to learning is fundamentally limited because it relies on pedagogy that is outdated. They compare the current pedagogy on the role of computer technology as a “…fast, wide ranging, editable and interactive system for the storage and location of vast amounts of information”. In doing so they call for a new pedagogy in which technology aids “…the children of the twenty-first century to acquire new knowledge, solve new problems and employ creativity and critical thinking in the design of new approaches to existing problems or, indeed, to new ones” (Noss & Pachler 1999, p.200).

If higher education is to develop online learning pedagogy that most effectively facilitates the learning process, then educators must thoroughly and wisely evaluate
the role of technology not only as a tool to access information but also as an aid in both the learning and teaching of skills in creative and analytical thought, social interaction, problem solving and self-expression. Unfortunately, however, very few of these attributes are valued in the economics of grades (Postman 1992; McGinn & Roth 1998).

2.2 Thinking Creatively About Teaching and Learning

There is much literature suggesting that Western traditional education, during the past century, is under considerable and conflicting pressure. Tiffin and Rajasingham (1995, p.1) believe, “schools as we know them are designed to prepare people for life in an industrial society.” Education based around instruction could be seen in large part as a simile of the traditional state. More recently with globalised telecommunications, and computing technologies, socialisations can now be totally different. One change seeks to view the learner as a self-organising, reflexive individual constructing an individual (relative, subjective) world-view using these approaches, whereas the instructivist or industrial view is another socialisation, is behavioural and stimulus focused, taking the lead from naturalistic and functionalist approaches.

Even the most cursory review of instructional design literature reveals an overwhelming number of informing theories, strategies and opinions on the manner in which instructional design should be undertaken, the outcomes to be sought and the reasons why one should begin the process. Instructional design is not a simple field, it is not defined or described with ease and it does not produce quick, elegant, unanimously agreed upon solutions to the complex problems produced by the educational realm. Different learners, educators, subject matter, learning environments and technologies all play their part in adding layers of intrigue to the process of instructional design.

Instructional designers seek to balance the needs, desires and expectations of the learner with the system limitations resulting from the applicable technology, the timeframes imposed and the outcomes desired by the educating party. In essence, instructional design is a process of instructional improvement that “involves
organizing and using tools of the mind and tools of learning to improve the conduct of education and training… In its most essential form, however, instructional design involves thinking creatively about teaching and learning” (Johnson & Foa 1989, p.3).

Johnson and Foa (1989) argue that effective instructional design incorporates three components:

- *Instructional Theory*, drawn from behavioural, developmental, social and cognitive psychology;
- *Instructional Technology*, consisting of communications, audio-visual media, information management and computer science; and
- *Instructional Management*, founded in systems analysis, organisational development, operations research and project management (p. 3).

How then are these to be perceived? As outlined in the first chapter there are assumptions that have been taken in the research. They are that Instructional Theory be positioned within the constructivist framework; that Instructional Technology is to be used within the instructional design; and that a systems thinking approach be the foundation of the Instructional Management approach.

The following sections (2.2.1 – 2.2.3) cover these points in more detail.

### 2.2.1 Instructional Theory

Instructional theories and learning theories seek to capture the way in which people learn so as to be able to aid the learning process most effectively. Instructional theories consider both the form and method of the instruction and also the learning style and motivation of the learner, in an effort to socialise (enculturate) the most efficient and effective learning strategies.

‘Individualised learning’ is an often discussed, but infrequently achieved, concept. There is a general understanding amongst instructional designers that individual
differences mean that the learning process varies from person to person (Carrier & Jonassen 1988; Ross & Schulz 1999). However, while many theories and models have been developed to incorporate the concepts of learning styles (and multiple intelligences), debate continues about the best ways to classify learning styles and the most effective way to cater for differences in learning styles (Silver et al. 1997). That said, there is broad agreement that an environment that allows for a variety of modes and methods of instruction is most likely to cater to different learning needs and, therefore, is most likely to promote individual or self-organised learning. For example, Ross and Schulz (1999) argue that varying the form and mode of teaching is an important part of catering to the individual needs of students. They believe that the Internet presents a new opportunity to help educators reach students by allowing the educator to produce a range of materials that accommodate the varying needs of learners with differing learning styles. Grasha and Yangarber-Hicks (2000) argue that students who excel in technological environments have different learning styles from those who underachieve in these environments.

Increasingly, it appears that there is an unavoidable link between theories of learning style and motivational concepts. The ARCS (Attention, Relevance, Confidence, Satisfaction) Motivation Model proposed by Keller and Suzuki (1988) recognises that students approach learning with a variety of motivations and that the personality or learning style of individuals has a significant effect on the factors by which they are motivated. Keller and Suzuki (1988) argue that no one particular motivational strategy is likely to cater for the wide range of learners undertaking a course of study. Cotton (1997) agrees that different methods of motivation will have varying levels of efficacy with different students.

A wide range of authors supports the notion that motivation strategy should be a major component of instructional design (eg. Klien et al. 1999; Keller & Suzuki 1988; Small 1997; Warren 1999). Keller and Suzuki (1988, p. 402) contend that “If the instruction is not well designed, or lacks motivational appeal beyond the novelty level, then learner involvement wanes”. Endorsing this perspective, Klien et al. (1999, p. 1) argue that the ability on the part of the learners to have choice in what they learn has a “…powerful and effective [impact] on a learner’s intrinsic motivation and ability to maintain interest.” Clearly, when undertaking instructional design,
educators should have as founding intent the desire to motivate and inspire students to learn and be aware of the factors, such as learner control, that can positively and negatively impact on learner motivation. Warren (1999, p. 1) asserts that, “An understanding of the factors that can affect motivation is essential to designing and implementing successful online learning scenarios.” Further, Warren claims that, “Poor motivation will almost always lead to poor achievement, while good motivation enables students to overcome problems and develop a positive attitude to the effort required to become truly skilled and knowledgeable” (1999, p. 1). This leads to the concept of self-directed learning that is central to contemporary constructivist theory.

Constructivism, as a theory of learning, seeks to support the individualised learning experience (Mergel 1998). Constructivist theorists contend that learners construct knowledge from experience, and that “learning occurs when learners actively create their own knowledge by trying to make sense out of the material that is presented to them.” (Mayer 1999, p. 143). This gives ultimate agency to the learner – action learning, and means constructivist theories stand in opposition to the notion that effective knowledge production is in the hands of the teacher. Advocating a constructivist framework, Mayer (1999) contends that learners synthesise meaning by comparing new concepts to ideas, objects and experiences with which they are familiar. Discrepancies between prior understanding and novel concepts cause the learner to modify their beliefs and create new knowledge (Sprague & Dede 1999). Constructivism is often proposed as an effective model for integrating technology into the learning environment, particularly in a distance education environment (Sprague & Dede 1999; Tam 2000).

A contradiction appears to arise when designing instruction within a constructivist framework, given that constructivism requires by its very nature that the learner direct the learning process suggesting an unstructured learning environment. Constructivists, however, reject claims that structure will by necessity restrict the learning process. Wilson (1997, p.3) argues that “…an instructional strategy that imposes structure may actually help learners make constructions needed for learning.” Mayer (1999, p.157) concurs, arguing that “…it is possible to design instruction that promotes constructivist learning”. Further support for the concept of
designing constructivist learning comes from Mergel (1998), who cites Jonassen as stating that constructivist instructional design primarily focuses on “…designing environments, which support the construction of knowledge.” (1998, p. 16) Constructivist instructional design therefore produces an outcome that is “…more facilitative in nature than prescriptive.” (Mergel 1998, p. 18) and allows individuals to “…derive understandings which may mirror or vary considerably from others’ views” (Hannafin 1993, p. 109).

Mayer (1999) describes the process of constructivist instructional design as ‘having an awareness’ of the learner’s three cognitive processes, namely selecting relevant information, organising incoming information, and integrating incoming information with existing knowledge. This also requires designing the instruction to include a supporting structure for each of these processes. Mayer explains this by arguing that, “…the goal is to encourage the learner to become cognitively involved in learning, instruction should be designed to help the reader identify useful information, understand how the material fits together, and see how the material relates to prior knowledge” (Mayer 1999, p. 152).

Tam (2000) draws heavily on Lebow’s ‘Five Principles toward a New Mindset’ to argue the importance of contextualising the learning process and promoting self-regulated learning. However, despite his enthusiasm for Lebow’s model, Tam does not provide a practical guide as to how this should be achieved. Wilson (1995b, p.10) contends that for effective constructivist instructional design, learners should be included in the design team and that both instructional and learner-driven goals should be set, allowing, “…for multiple goals for the different learners.” Wilson (1995a) also proposes a range of guidelines for undertaking constructivist instructional design. He concedes that constructivist instructional design can be achieved but warns that this is by no means a guarantee that it will be done well.

By way of summary, constructivists generally concur that instructional design is a very important part of planning effective learning experiences for learners:

Constructivist models of instruction strive to create environments where learners actively participate in the environment in ways that are intended
to help them construct their own knowledge, rather than having the
teacher interpret the world and ensure that students understand the world
as they have told them. (Jonassen 2000, p.4)

However, constructivists also warn that the design produced must not prohibit the
learner from being able to direct (at least at some level) the pace and objectives of
their own learning. The other point to note is that there are many systemic structures
in the University system that provide a range of forces that restrict instructional
design, (eg. topic based subject curriculum and assessment).

2.2.2 Instructional Technology

According to Johnson and Foa (1989), the Instructional Technology component of
Instructional Design originates from Information Science, and from Information
Science “…gains insights into the structure, organisation and management of
information” (1989, p. 10). They suggest that the development of an understanding
of the concepts and processes required for most efficient information sequencing and
assembly is more significant than other technological advances. Johnson and Foa
suggest that instructional design, taking into account these factors and the intelligent
selection of emerging new media, results in a more reasoned and effective use of
technology within the learning environment. To this end they believe that the
development of information technology has provided a greater range of more flexible
technologies for use as information presentation and learning tools.

Jonassen (2000, p. 2) argues that technologies should be applied “…as cognitive
learning tools rather than as instructional media…” and that they should be used by
the learners (rather than by the instructional designers) as tools to construct
knowledge. The core proposition here is that technologies should be used as
supporting cognitive tools across a wide variety of disciplines in order to produce
higher order learning rather than as media by which information can be transferred to
learners.

In the early 1980’s Carrier and Jonassen suggested that “The widespread use of
microcomputers and other new technologies for the delivery of instruction heightens
educators’ interest in the possibilities for individualised instruction.” Their argument is based on the propositions that the then new technologies were “…oriented towards individuals rather than large groups, …provide maximum flexibility, …are becoming multi-modal, and …provide management systems which automate the monitoring of students’ progress throughout the instructional process” (1988, p. 203, 204). While technologies may indeed provide new opportunities, many factors outside the technologies themselves will impact on the effectiveness of their implementation into the learning environment.

Grasha and Yangarber-Hicks raise several issues associated with the integration of instructional technology, including “the potential for technology users to create an impersonal mode of relationships…”, this is a commonly raised issue in distance learning environments of all types. They also highlight the expense involved in keeping up with leading edge technology and the lack of “empirical evidence on its ability to promote learning” as concerns. They do, however, argue that “for those willing to experiment with technology, such problems can be managed if people are willing to evaluate what they do to identify any shortcomings” (2000, p. 2).

Further to this Grasha and Yangarber-Hicks claim that “the implication of the work on learning styles and technology is that students who prefer, and benefit from, learning in technologically based courses are different from those who prefer more traditional courses.” (2000, p. 2) This has significant ramifications for the design of instruction that incorporates instructional technology. If the premise that those students who prefer and achieve better in technology based courses are a distinct group from those students who prefer a traditional educational media is true, then care must be taken so that our instructional design does not exclude or disadvantage any group of students.

Sanford and Richardson (1997) propose that there is an inefficient under-use of technology within the classroom as a result of the fact that “teachers are reluctant to exploit instructional technologies due to a lack of adequate knowledge and experience in technology usage” (1997, p. 12). They suggest that this leads to an application of technology as an add-on rather than an integrated course component. Their argument is based on the statement by Schneider (1994) that “New
technologies must be grounded in some model of instruction and learning.” The importance of training teachers in the use of technology before requiring them to teach using the technology cannot be overstated. The likelihood is that teachers who are not well trained in the use of a particular technology will be unable to effectively implement the technology as a learning tool.

Hedberg et al (1994) highlight the importance of combining both recent technological advances and the latest developments in learning strategies and models. They suggest that the constructivist learning pedagogy is well supported by the opportunities provided by learning technologies and that it would be easy to implement new forms of technology into instructional design without considering the implications these have from a pedagogical angle. Equally it would be relatively straightforward to continue to review and update pedagogy and not integrate any further technological developments. The challenge lies in integrating the latest developments in both technology and pedagogy into a seamless learning environment.

Romiszowski (1987) argues that instructional technology has six roles to play within the educational environment:

1. As a tool used by the student;
2. As a tutor of the student;
3. As a tutee of the student;
4. As a tool of the teacher (and instructional designer);
5. As a tutor of the teacher (or designer); and
6. As a tutee of the teaching professions

Of course none of these roles are straightforward relationships. Romiszowski believes that in each of these situations there are both positive and negative ramifications. Romiszowski (1987) does not presume to pass judgement on the efficacy or rightful place of instructional technology within the educational environment; rather he seeks to promote discussion about “…the possible sources of promising new developments and also the problems associated with these potential developments” (1987, p. 13). Such discussion is vital as new technologies emerge in
the decades ahead and if instructional technology that supports effective learning is to be developed and implemented.

What emerges from this literature is a view that, whilst instructional technology is a powerful and empowering tool for both students and teachers, it is not an end in itself, and does not necessarily lead to improved learning outcomes. The application of instructional technology should be investigated and encouraged; however, it must be considered within the context of a well defined and understood learning paradigm. Like all tools, instructional technology can have a significant, positive impact when it is used wisely, with the benefit of experience and training; however, it can also have a detrimental effect that must be considered in any instructional design.

2.2.3 Instructional Management

Johnson and Foa (1989) proposed that the third aspect of instructional design is instructional management, derived from the fields of Management Science including Systems Analysis. Banathy contends that:

Only if we individually and collectively learn to understand and apply the systems view shall we be able to “see the world anew,” and only then will we be able to see, re-conceptualise and redefine education as a social system. Only then can we engage in the design of systems that will nurture learning and enable the development of the fullness of human potential. (Banathy 1995, p. 5)

In his pioneering work in this area Romiszowski (1977, p. 20) proposed that the systems approach to education and training, “…is likely to become the backbone of change in education.”

So, to the origins of the systems approach. Romiszowski’s (1977, p. 18) initial definition of the systems approach was “The stages in applying an approach based on general systems theory may also be categorised as stages of analysis, synthesis and evaluation.” He later expanded this description to propose that “instructional systems design is therefore a three-phase process of establishing precise and useful objectives,
planning viable routes and testing them out.” (Romiszowski 1981, p. 4) He also emphasized that “the systems approach is seen as very much a heuristic process, rather than an algorithmic sequence of steps.” (1981, p. 1) This view is supported by Finegan (1994, p. 2), who, in his discussion of soft systems methodology, (see below) notes, “…it does not necessarily impose a sequence in which it should be applied”, the antithesis of a structuralist perspective. Instead “a more heuristic and subjective approach should be taken” (1994, p. 1). Subjectivity, as seen earlier (Section 2.2), provides a second and/or alternative perspective to instructional design.

Banathy (1992, p. 4) outlines the need in the field of education for a paradigm shift from mindsets of the previous era, which she calls the “industrial machine age”, to a new type of thinking “…that is based on the new world view.” Her argument for this shift to a systems view is the necessity to underpin recognition of the changed social patterns and conditions ushered in by the so-called ‘post-modern turn’:

> The second half of the twentieth century is marked by massive changes affecting all aspects of our lives. We have experienced major societal transformation from the industrial machine age to the post-industrial information/knowledge age. The changes and transformations have shaped our thinking and recast the way we view ourselves, the systems of which we are part, the environment in which we live and the way we view the world. (Banathy 1992, p. 3)

Banathy distinguishes between the old and new mindsets by claiming that the old mindset focused on how to “manage things” (1992, p. 3) and the new mindset is focused on enabling us to “manage complexity” (1992, p. 3). She emphasizes that a systems view of education proposes an integration rather than separation of subject areas and that a systems view should be applied to “BOTH educational scholarship and educational practice.” (1992, p. 8, emphasis in original) Banathy further argues that the systems view be based on human activity systems.

Finegan agrees with Banathy that a systems theory based on traditional processes of reductionism and fragmentation “…may be inappropriate for knowledge elicitation, and Soft Systems Methodology (SSM) is identified as providing a suitable theoretical
framework.” (1994, p. 1) He further states “The methodology is designed to allow the human element of such systems to be incorporated into system design work.” (1994, p. 2). Finegan (1994, p. 1) proposes that “Soft Systems Methodology provides an effective and efficient way to carry out a systems analysis of processes in which technological processes and human activities are interdependent.” This is apparent within the systems view of education.

Moses (2000) takes a different approach and supports a more pervasive education information system which administers and manages information at three levels within the education field; Policy and Strategy Level, Management Level and Operational Level, and provides information required by parents, community leaders, teachers and administrators at all levels. This type of information management is less likely to have a direct impact on the process of instructional design. However, the open access to detailed educational information proposed by Moses is very likely to result in more consideration of the importance of instructional design, a point that is considered further in the next section.

2.3 Virtual Learning and Open Learning Environments

The inexorable link among instructional theory, ICT and learning management is implemented, for example, in the following model for learning. Resources-based learning provides a relevant example of related ideas to those proposed in the ITSM Discipline learning environment. Macdonald and Mason (1999, p. 1) draw on the work of Taylor and Laurillard and provide a useful definition of resource-based learning as being “open access, self-directed learning from a large information source”. Resource-based learning seeks to empower students to pursue learning and construct knowledge by providing a great variety of resources from which they can obtain and synthesise knowledge.

Macdonald and Mason (1999) highlight the fact that the Internet as in the World Wide Web provides an unprecedented opportunity for students to gain access to a range of learning materials from a great variety of sources and therefore a wonderful opportunity for resource-based learning. Indeed a defining feature of the resource library provided by the Internet is that it is virtually inexhaustible. “Although they
can explore its multitude of possibilities, its size is so great and it changes so much, so quickly, that no individual could know it as a whole in the way in which they could be aware of a conventional school” (Tiffin & Rajasingham 1995, p. 16). This endless supply of information means that online learning need not be bounded in the way that conventional education has been previously.

A new mindset has emerged. Teaching and learning is seen as an ongoing process rather than a program with a fixed starting and ending point and the importance of widespread participation by learners in the design of their own learning has been recognised. Distance learning technologies are particularly well suited to a more dynamic approach to managing learning …New media makes it easier. (Kimball 1998, p. 28)

Kimball discusses the idea that online learning can provide not only a greater range of resources through which the learner can navigate, but also a more flexible environment in which participants and teachers can dialogue and improve the course as they study. Further to this, online learning is thought to provide a wide range of learning opportunities required to support a variety of different learning styles. Philip Uys (1998) notes that as a result of the opportunity to hyperlink in web and intranets, online courses allow students some control over their progression in terms of time, place and pace. “The learner can thus take any route through the content and activities; the only fixed requirement is that the assessments need to be completed before credit can be obtained!” (1998, p. 67-68) He also believes that, “Hypermedia assists the instructional designer in catering for different learning styles and ways of navigating a course” (1998, p. 67).

The online learning environment provides a rich variety of learning resources including video, audio, and text-based resources with a broad range of intentions and authors, as well as the opportunity to communicate in any of these modes with experts in the field of interest. Bilotta et al (1995, p. 1) argue that “a WWW student centred educational environment” built on these principles “…offers users the possibility to navigate in a hypermedia way through the wide range of servers which store the information such as museums, laboratories, cultural agencies, universities, digital libraries and more.” (1995, p. 3) Kimball (1998) discusses a practical example
of this in his description of an occasion when a well-known author met with students of an advanced management course online rather than travelling to be present at the class:

They were able to interact with him over time rather than for a single-shot guest lecture and so could explore his ideas in greater depth. One of the “unintended” benefits of this was that students for whom English was not their first language felt better able to think and write in contrast to face-to-face when the conversation goes too fast. (Kimball 1998, p. 32)

Henderson et al (1997, p. 111) argue that “the Web should be used as a cognitive tool to enhance thinking, problem solving and learning.” In the same paper they refer to research that “…suggest(s) that, because the Web allows browsing and thematic exploration, it facilitates higher order cognitive processes” (1997, p. 103).

Another example of the application of resource-based learning techniques to the web is the SOFA (Student-centred On-line Formative Activity) proposed by Basiel and Jones (1997, p. 1) and founded on “Web-based Constructivist learning theories…” as a model for Web-based instructional environment design. They suggest that the active participation that is required of students in models with this type of approach, with the teacher serving as a guide to support students to find solutions, facilitates effective learning in an online environment.

There are, of course, some dangers in providing a resource-based learning environment centred on the World Wide Web, particularly in regard to the almost infinite number of resources available. Though Romiszowski (1997, p. 32) believes there are “…undisputed technical advantages of making information more easily and democratically available”, he notes a “…reason for caution is the limited capacity of the end-users to find their way through an ‘exploding universe’ of information in an effective and efficient manner…” (1997, p. 32). Macdonald and Mason (1999) note that another area for concern in developing resource-based learning on the Internet is the requirement for the student to have, or acquire, the skills to both access the information and study it (read, interpret, analyse and critique) effectively once it has been obtained.
There are many different views about the place and practice of technology for instructional design and there seems little doubt that the Internet, and learning based on the resources it provides, will continue to become a significant part of the education system of the future. The vital aspect of this discussion is that both educators and students must discover how to use the technology and the information most effectively as tools to enhance learning. Educators and students alike must be willing to adjust to the different learning models of the new information age if they are to harness the power of the tools for learning.

The past decade has seen the advancement of the Internet, information and communications technology to the point where online learning is not only plausible but it has become part of the mainstream educational discourse. The relevance of information and communications technology for higher education specifically is probably best viewed from the perspectives of lifelong learning, on the one hand, and educational rationalisation on the other. Between these two perspectives there exists plenty of debate as to the veracity and efficacy of using these technologies in education. That said, the precedents for the application of information and communications technology in education are in place and form the basis of considerable worldwide research and development.

There is a blurring of the many instructional design initiatives as the move toward ‘resource-based learning’ via computers and telecommunications occurs. Many aspects of resource-based learning find their origin and/or presence in Virtual Learning Environments, Open Learning and computer mediated distance learning, as examples. It is in more recent literature reviews that virtual learning environments and open learning have been published (Ryan et al. 2000; Salmon 2000; Peters & Roberts 1998). Indeed, a number of virtual learning environments such as Virtual Classroom (Hiltz 1990; Porter 1997), Virtual University (Ryan et al. 2000), Virtual Teaching (Bilton-Ward, 1997), Virtual Lectures (Smeaton 1997; Signor 2003a, b) and Virtual Campus (van Dusen 1997) are now reported in literature.

New learning technologies allow for the transformation of the way knowledge is packaged, delivered, viewed and evaluated (Merrill 1997a-c, 2000). Much of this
transformation emanates from the proliferation of neo-liberal ideas of the ‘learning society’ where individuals and organisations are encouraged to take control of the learning process through flexible, any-time, any-place studies (Dearing 1997). Worldwide a new learning population is thought to have entered the education marketplace, a population not always or best catered for through traditional university production and delivery processes. Information technologies are offering an alternative way to traditional approaches for the offering of courses to remote student population and/or working students desiring to study from home or in the place of employment. Building on the tradition of distance learning, open learning programs and industry sensitive learning provisions are proliferating across the educational landscape (Dearing 1997).

Virtual learning environments are implanted using learning management systems, and are typically environments where the system manages the curriculum materials, testing and assessment, synchronous and asynchronous communications and student administration. Proprietary products include WebCT, Lotus Learning Space, Microsoft MLT, and Blackboard.

This brings us back to the theoretical construct of the cognitive viewpoint which is often proffered by open learning proponents (Ryan et al. 2000; Laurillard 1996). Clift and Chambers (1994), while drawing on a range of commentators, surmise that broadly the open learning process should view learners as:

- having individual cognitive strategies for using, managing, eliciting and constructing individual meaning and understanding (Wittrock 1977);
- being capable of deriving information, evaluating and judging, and justifying propositions for any particular problem-solving scenario (Eisner 1993);
- being problem solvers rather than operational and content oriented (Gibbs 1991)
• having the capacity to exhibit generic skills such as problem solving, creative, holistic thinkers, information literate, … (Chambers, Clift & Sissons 1995).

Ryan et al (2000) have gone further by taking into account both positive and negative aspects of such broad open learning approaches. They describe these as:

• advantages including;
  • students may work at their own space and pace;
  • feedback can be provided on progress;
  • transparency of the technology to thorough evaluation;
  • efficient use of resources through re-usability of learning materials.
• disadvantages including;
  • high initial costs of materials development;
  • update and upgrade costs;
  • need for students to be well-motivated and self-organising learners;
  • lack of peer contact and interaction;
  • need for flexibly available anytime tutorial support; and
  • a problem ensuring pedagogically sound learning materials. (2000,p. 32)

As the majority of the design and development of the ITSM Discipline learning environment was done by me as the researcher, it is therefore appropriate to provide a personal profile, roles and accountabilities during the period of 1997 to 2002, the period of development.

2.4 Active Learning Theory

It is difficult to imagine that there will ever be a single instructional design that we all can draw upon in order to deliver effective training and education. The principal arguments that emanate today for understanding learning are multitudinous which
leaves you open to creating your own interpretive foundation if you happen to be a researcher, developer and teacher in the tertiary education sphere. The Active Learning model provides both theory and practice, including procedures making implementation and review possible relative to other similar approaches.

It was my choice to use the ‘Active Learning theory’ of Meyers and Jones (1993). This was in part driven by Swinburne Lilydale perceptions of learner-centred education and also by the pragmatic that it was available and covered the majority of the ITSM Discipline learning environment desires. This reinforced my desire not to view teaching as telling but to view learning as generative process of the learners’ making an effort to construct meaning and build understanding.

The essence of Meyers and Jones’ work revolves around involving students with the course content through discussion and listening, reading and writing, critical and reflective thinking and this put the students “into situations where they must contribute to teaching themselves and others” (Meyers & Jones, 1993, p 13). Within the active learning framework there are a series of approaches which when considered independently add little to the learning experience, however, when combined as a holistic approach Meyers and Jones support a collaborative, constructive, reflective and generative learning approach. Meyers and Jones (1993) noted several strategies and techniques when creating an active-learning environment:

- Informal/small groups
- Cooperative student projects
- Simulations
- Case Studies
- Resources
- Integrated content
- Effective technology use
- Assessment

The notion of ‘active learning’ is built upon two basic assumptions: firstly, that learning is by nature an active endeavour and secondly, that different people learn in
different ways, (Meyer & Jones 1993). Meyer and Jones suggest that active learning strategies when used in higher education will increase the potential that students will engage in constructive learning, not just pragmatic and utilitarian fact collection. This thought is continued in the concept of ‘deep learning’ (Atherton, 2003). Meyer and Jones (1993) further suggest that when students are involved actively this leads them to discuss, question, clarify and write about course content. However, they offer no evidence that this is or will be normative behaviour; instead this seems to be, yet again, an assumption that students by nature inherently engage in such activity when it is presented to them. They do make the concession that “…students may need a little prodding and encouragement to get started with active learning” (1993, p. xii).

2.4.1 The Nature of Active Learning

According to Meyer and Jones Active Learning consists of three interrelated factors: ‘basic elements’; ‘learning strategies’; and ‘teaching resources’ (1993). There are four basic elements, talking and listening; writing; reading; and reflecting. Learning strategies, they argue, can be broken down to include small groups; case studies; and so on. Finally, teaching resources including outside speakers; assignments; and so on (refer Figure 2.1 below). Meyers and Jones make several assumptions about learning, that:

- learning is by its very nature an active process;
- different people learn in different ways; and
- the process of education is about self-development and that learning is truly meaningful only when learners have taken knowledge and made it their own. (Meyer & Jones 1993, p. 20)

Meyers and Jones have taken the theoretical premise of Piaget that children do not receive knowledge positively, and construct mental models as a relativistic association. They argue that “…students no matter what their age, need opportunities to engage in activities - with teachers, fellow students and material – that helps them create their own mental model structures and test them, thus making better sense of the world around them”. (1993, pp20-21)
Implicit within Meyers and Jones’ (1993) notion of active learning is: the need for structure and guidance by teachers; within a collaborative aggregation of students and teachers; and a structural learning environment. To structure that environment, Meyers and Jones basic elements must be present. Firstly, talking and listening, and here the presumption is that students and teachers share what has been read, heard, observed and experienced. They point out that in ‘vocalising’ our thoughts we are in fact clarifying which is an integral part of reflective learning. They point to others’ research that uses thinking aloud strategies in order to solve problems. They suggest creating opportunities for meaningful dialogue, particularly where intercultural sensitivities exist, therefore reference the need for the teacher to be proactive in structuring the class, groups and individual activities.

Secondly, Meyers and Jones (1993) suggest writing as a clarifying action and they emphasise the purpose of writing is for students to “explore their own thinking” (p. 24). They quote research from Fulwiler (1987); Emig (1977); Angelo (1991) and Zinsser (1988). Such research encourages focused writing exercises that can be discussed and assessed by teachers and/or peers. As a foundation to support the student writing it is suggested that terms that should be included in the teachers language (e.g. analyse, compare, contrast, describe, evaluate, justify, prove,
summarise, synthesise) be provided with a clear definition so that students can know the certainty of the terms and their associated requirements.

Thirdly, Meyers and Jones (1993) believe that reading requires the student to think in different ways owing to the need to understand someone else’s ways of ordering knowledge and experience. When I constructed a first year core undergraduate subject, my research indicated the requirement for students to gain “information literacy” (Calway, 1999). This information literacy revolved around the collection and critical analysis of extant materials. Putting into action such skills as scanning, identifying, summarising, sorting and prioritising information from multiple sources are attributes that Meyers and Jones support. Meyers and Jones (1993) point to research that indicate how writing sharpens the information in one’s mind and brings to memory more readily learned concepts.

Fourthly, using reflective and cognitive processes of ‘sorting out messes’, or making sense of concepts and materials. Reflection is most often associated with deep learning and high order thinking and the ability to identify concepts, issues and ideas and to contextualise these (bring these into focus within new and novel relationships), both intrinsically and extrinsically. Here Meyers and Jones (1993) emphasise the necessity to structure exercises that specifically focus the skill of reflection. One such method is the inclusion of reflective journals to the structured learning of students.

A point to note in summary is that while the above points may be recognisable in students, it does not extrapolate that they have honed these elements into repeatable skills.

2.4.2 Curriculum and Instructional Design

Meyers and Jones suggest that using active learning in the classroom requires changes in how teachers perceive their role. I have argued the need to move students from passive participants to active learners and in like manner teachers need to move from centre-stage to learning collaboration (Calway, 2002). As I point out this is a shift beyond simply seeing teachers as facilitators or managers of learning to seeing
teachers as learners equally participating in the studies, which is more easily said than done.

Essential to an active learning environment, also supported by Meyers and Jones point too, are four communication requisites:

- clarifying course objectives (purpose) and content;
- creating a positive classroom [and I would add online] tone;
- coping with teaching space; and
- knowing more about our students. (Meyers and Jones 1993)

Content provision, regardless of the technology or instructional design, is to include the skills enumerated earlier, as well as rote elements (facts, figures, competencies, etc.).

Meyers and Jones (1993) point to the technique of asking, what do I want students to know and be able to do by the end of a class? However, this would seem simplistic as a design initiative given the holistic nature of learning that is greater than the sum of its parts (i.e. subjects and classes). More broadly the approach suggested at Swinburne in 2002 was to spell out graduate attributes for the entire course and then analyse the learning outcomes commensurate with the stated attributes.

2.4.3 Informal small groups and Cooperative Projects

Within all the classroom tutorials and with many of the assessment items, certain skills are exercised when students collaborate in informal and formalised small groups. Meyers and Jones (1993) suggest that students learn to be listeners, cooperate in a common task, give and receive constructive feedback, respect differences of opinion, support judgements with evidence, and appreciate diverse points of view and culture.

For the most part I had instructed staff and students to use small group collaboration as a way of sharing workload rather than the explicit generation, assessment and
processing of ideas, although these are used widely in tutorial exercises. Groups are generally easy to form and can be managed by the teaching staff either in class or online. While small group assessment items tend to be pragmatically dealt with, a far less formal and holistic classroom small group exercise will generally activate the creativity, critique, problem-solving and communication skills enunciated by Meyers and Jones.

2.4.4 Student Projects, Simulation and Case Studies

The basis of the ITSM Discipline learning template is to incorporate learning that is grounded in simulation and case studies (e.g. subject LEB310 Appendix 1). As an approach Meyers and Jones (1993) point to the use of both these as contextualising processes. This is where theory and practice combine. While simulations are for the large part artificial and often constrained, case studies on the other hand tend to be real-world and verifiable.

Case studies that are used in ITSM Disciple subjects are generally calling for the student to exercise higher-order learning and communication skills including situation analysis and evaluations, as can be seen in the graduate attributes of a subject outline. As Meyers and Jones (1993) suggest case studies provide a valuable means of posing realistic problems that are open ended and without set answers. The ITSM Discipline use of simulations, and in particular case studies, means that a single case study can be used across many and varied undergraduate subjects. In particular this allows students to see the inter-relationships of problems across disciplines and the consequences for decisions made in one aspect upon others elsewhere. Swinburne also has real-world encapsulation of problems through their focus upon work-integrated and industry-based learning options for students (e.g. subject LZZ301 - http://domino.swin.edu.au/cd31.nsf/).

2.4.5 Matching Technologies to Active Learning

Meyers and Jones (1993) believe that well designed strategies and good resources are an important combination for creating an active learning environment. The ITSM Discipline learning environment in this respect is guided by this imperative. All
significant learning materials are made available online and supported by careful selection of print and web-based resources.

Information Literacy is a ‘core’ subject required to be undertaken by all students of Swinburne Lilydale undergraduate courses. Information Literacy requires students to develop reading, writing, summarisation, searching and communication skills. This subject is enhanced through the provision of visiting experts and community engagement through work-based projects. All of the classrooms at Swinburne Lilydale are fitted with computer, Internet, projection equipment and instructional materials that can be used either in classrooms or online (e.g. LEB310 Appendix 1).

Students are encouraged to preview all learning materials in order that classroom contact can be focused about the exercising of case studies and simulations, and to diminish the rote learning and teaching.

2.4.6 Active Learning and Liberal Education Fit

To conclude this section it is pertinent to re-state the assumptions that Meyers and Jones (1993) have made, assumptions that were also stated in my opening comments in Chapter One as being central to the development of the ITSM Discipline learning environment, namely:

- learning is by nature an active enterprise; and
- individuals learn in different ways.

This, by its very nature, requires that teachers be multi-vitiate in their ability to discern and quickly adopt teaching styles that reflect the environment within which the student and teacher cooperate.

Students are taken to the edge of their passivity as are the teachers but this can result in a greater appreciation of the learning being sought and the teaching being offered. As Meyers and Jones (1993 p 162) point out, “Students accustomed to the ‘passive receptacle’ approach to learning may not initially welcome active involvement in
their education”. This is the case for the ITSM Discipline and as shown in the Dissertation, Chapter Four of this folio student learning approaches remain passive for the most part. Active learning therefore is as much a change of mind and/or disposition in teachers and students as it is a pedagogy for use and implementation by teachers and students.

2.5 **Summary**

Chapter Two has reported a synopsis of the main theory and developments in the past two decades as they relate to the research reported in this folio. In summary there are several considerations that were discussed as they relate to instructional design in the period 1997 – 2002, the period during which the ITSM Discipline learning environment was developed and used.
Chapter Three
ITSM Discipline Learning Environment (Evolution)
Descriptive Analysis and Professional Writing

3.0 Introduction

This chapter records an evolution of the learning environment of 1997/8 through to the ITSM Discipline learning environment and enculturation at the close of 2003. The data collection used comprises personal journals, published and public records, published surveys and audits (refer Section 3.1). A descriptive meta analysis approach is applied to capture both the start and end points and significant events occurring during that period. Such an approach allows a more holistic view of individual relationships. The aim of the present research is to provide a rich picture as a basis for the analysis of a problematic paradigm, identified and reported in the Dissertation of Chapter Four.

This chapter starts with a snapshot of the 1997/8 description of the former Computing Discipline and learning environment that I subsequently redesigned for the ITSM Discipline staff to implement as a new learning environment. The description seeks to account for some of the intrinsic and extrinsic forces at that time, such as government policy; a new campus at Swinburne Lilydale in 1996; globalisation and personalisation of computing and communications technologies; and IT industry and economic rationalisation changes.

The mid sections of the chapter capture a series of influences and events (changes) as they were recorded between 1998 and 2003. Not all instances are recorded as not all were captured by me or ITSM Discipline staff. However, this did not stop me from capturing major events during the development of the ITSM Discipline learning environment as an enculturation. As with a forest, we do not need to see a tree fall to know from the result that it has fallen. What may remain a mystery is how it fell and the opportunity to record that event. The events and changes that are recorded in this
Chapter 3

Chapter 3 includes, for example, the introduction of learning management systems, virtual learning guides and lectures, multi-disciplinary degrees and curricula, active and participative learning pedagogy, modified assessment and work integrated learning.

The chapter concludes with a view of the ITSM Discipline learning environment as a learning enculturation in 2003 and identifies problematic relationships that provide stimulus for further research and remedial actions. The essentials described in this chapter are to be seen as qualitative and subjective in nature. However, the completed chapter has been subjected to review by the staff and several students of the ITSM Discipline as a means of reliability and verification, therefore producing a shared subjectivity around the narrative.

Personal journals, published papers and public documents that I have written and that are included within this chapter are marked with a distinctive bold line down the right hand side margin of the page.

3.1 Descriptive Meta Narrative Study Approach

The folio presents a situated and descriptive collection of papers within a meta narrative that describes their existence and context as well as my analysis and comment. The data collection construction for this chapter is that of a qualitative unobtrusive response that can capture pictures of points in time, events and actions (c.f. Heron & McClure 1987; Kellehear 1993). The meta narrative specifically looks at events and artefacts from a particular situation and scenario, i.e. the ITSM Discipline learning environment development. In essence there are items and records left behind when projects and societies move on and it is these deposits that provide the remnants that are suggestive of progression or evolution of the learning environment, infrastructure and models.

3.1.1 Data Collection and Meta Analysis

This part of the research requires a rich discussion of the ITSM Discipline learning environment as a collection of forces, models and environment detail. The data
resources include personal observations and journal entries collected at various stages of development. To augment my personal recordings and published materials, I make use of public records, memos and university publications. By their very nature these data are secondary for the most part.

The ITSM learning environment evolved through four broad stages and was captured, after I had completed the design and the development was implemented, as a digital copy of the web-site pages, files and learning materials. There were four learning environment generations, each building upon the prior generation as the active learning theories and methods were engaged and analysed; each required a change in the last learning technology as the various ICT and learning management systems matured or were superseded. Data include a number of usability surveys that were conducted as the learning environments and curriculum were developed. These have been previously published as a series of papers with their own specific purpose and frame of reference. The digital data collection was produced as print-based copies of each item as it was made publicly available, as well as retaining a digital copy.

Looking at the intrinsic and extrinsic environments and cultural models, and equally looking at the forces for change occurring, can provide considerable volumes of contextual data. One example could be when implementing the first learning management system in 1998/9 as a means of providing a virtual learning guide. It is important to note that prior to 1998 any implementation would have failed owing to a lack of ICT within the student population. If the then learning management system was interpreted in terms of today’s (being 2003) technology, we could be critical of the pedagogical interpretation being very linear and content focused.

Further, the technology in Swinburne 1997/8 was relatively slow, subject to failure, and capable of transmission of only small quantities of learning content at a time of text-based learning materials. Compare that to today (being 2003) and it now seems easy to use full synchronisation, online video and audio communications, interactive simulations and related web-based products, significant contextual and technological change which are recorded in the data collection.
An integral element of the data collection construction was to locate alternative publicly accessible documents relating to the same topic and particularly policy documents and publicly attested articles, memos and papers. Indicative of the many resources available are:

- University web published documents;
- Australian Government policy publications;
- Australian IT industry web-sites and published materials;
- Proprietary software and technology specifications;
- Research journals recorded during the life of the ITSM Discipline action project;
- Accreditation documentation;
- ITSM Discipline surveys and reports completed by self during the five year period reported.

Each data item is introduced as appendices when referenced in this chapter of the folio.

### 3.1.2 Reflective Interviews with Staff

As part of data collected on the efficacy of the ITSM Discipline learning environment interviews were conducted with staff at the close of 2002 for their reflections of the then final version of the ITSM Discipline learning environment, WebCT and Reflective Journals processes. The method I used was that staff in the ITSM Discipline were asked to complete a survey consisting of 20 open-ended questions that were designed to elucidate their perception of the new WebCT system, its implementation and effectiveness, as well as their perceptions of the value of the Student Journals. Refer to Appendix 2 for the set of interview question and the final report.
3.2 Winds of Change 1997

In the early 1990s a decision was made by the academic staff at the Mooroolbark campus that every subject taught at that campus must have a Learning Guide and Subject Outline. These should be prescribed in printed form and available for sale at cost to all students. The learning guides were to contain the substantive content and learning resources of the subject being taught, and to express the learning objectives inherent in the subject. Guided by the advice from Paterson and Weal (1995) the Learning Materials Specification states:

Learning Guides are the vehicle for communicating learning expectations and learning modes. They map the route that your students should follow in order to complete their studies successfully.

The learning guide approach has been operational since 1994 at Mooroolbark. The implementation of this practice and policy has, I believe, raised questions about the learning ramifications and outcomes. Before asking the questions, it is important to state the axiomatic position of the academics concerned, with the learning materials specification and the extant structure of the learning guide in mind. Firstly, there is the philosophical position of flexibility and learner-centeredness as would be suggested by Jonassen (1999) and others. Secondly, structural requirements were that multi-modal instructional support be available for the student. It should also be noted that it was not a requirement at that time for academics to offer online learning materials as one such mode. Subject websites for all subjects were made a requirement in 2002, however, this was only as a secondary resource in most instances as academics continued to rely upon printed learning guides.

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<th>Subject level components</th>
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<th>Topic level components</th>
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<td>Self-assessment answers</td>
<td>Bibliography</td>
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<td>Further Reading</td>
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Table 3.1 The learning guide and learning materials specification division – 1995/2002
Each subject was to consist of a number of modules, with each module consisting of one or more topics (Paterson & Weal 1995). To date no follow-up research or evaluation has transpired in a systematic way to investigate the effectiveness of the approach as a learning framework or a subject delivery tool, other than to note that students are progressing at rates similar to others at the city campus of the University. An audit conducted in 1999 found that the learning management specification had varying degrees of compliance and suggested there were considerable weaknesses in the overall compliance.

3.3 Agency, Events and Change

In 1997/8, several events (e.g. New Discipline Leader, New Undergraduate Degree) transpired whereby a significant number (16) of the Computing and Information Technology subjects required revision and/or replacing. There was little time available, less than eight weeks, to write the learning materials and have them published (in print-based form for purchase by students) prior to the start of the teaching semester. As the discipline leader, I decided to design and implement an online computer-mediated learning materials template similar to the print-based version. This meant that academics undertook a progressive publication approach to subject development. Initially, all the ITSM Discipline academics were able to achieve an online file-based version (Microsoft Word) of the topic content and learning objectives, on a week-by-week basis, available to students both via ‘dial-up’ connection and also via campus computer access labs.

Permission was granted by the Head of Studies Swinburne Lilydale for the learning guides for the computing and information technology subjects to be progressively published during the first and second semesters of 1998. Progressive publication meant that the learning guide modules and topics were to be made available to the students at least a few weeks prior to the teaching of the module. So that if there were four modules and twelve topics then the first two topics and first module notes were to be ready two weeks before the start of semester with each subsequent topic and module released weekly in sequence. Some problems were experienced with this approach toward the middle of the study period when staff concentrated on
assessments and not on learning materials. Student complaints resulted in staff being instructed to complete their unfinished modules.

To augment the progressive publication an approach was required that would provide the materials to students in a timely manner. Print-based learning guides were no longer an option owing to the considerable number of pieces and repetitive cost. In 1998 computer-based distribution of learning materials became a slow but low cost and viable option for publication. The module and topic materials, including lecture slides, were captured as small word-processed or PowerPoint files and stored on the Swinburne Lilydale computer network. Students could independently access and print the learning materials at Swinburne Lilydale or by modem connection. To facilitate timely file transfer the files were required to be small owing to the slowness of the telecommunications network at that time. Students were aware of the implications of this approach, but as they were studying computing and information technology subjects they did not see this as a problem, as revealed through student subject surveys conducted by Swinburne each semester.

To place this computer-based innovation within the wider context it must be remembered that the Internet only became publicly viable in the mid 1990s and the public speed of telecommunications technologies was a maximum of 20,000 bps, (bits per second). Broadband telecommunications that we now take for granted had yet to be made available publicly. Personal computers were also limited in power but were readily available to families who could afford them, as was the telecommunications connection. A survey I conducted in 1999 with the first year undergraduate students revealed that 85% of students (approximately 270) had home computers and 70% had telecommunications network connection (Calway 2000 – Paper 1 below). Students who did not have home computer and telecommunications access were encouraged to make use of the many laboratory computers available at Swinburne Lilydale.

Swinburne had as one of the conditions for establishment of the new Swinburne Lilydale campus in 1997 (the year the Lilydale campus was opened) that students would be able and encouraged to use flexible and multi-modal learning. This included the premise that the majority of students would study off-campus and only
come to Swinburne Lilydale for referential materials, lectures and tutorials. While this was the premise of the University Chancellery it was not the practice of the Swinburne Lilydale students and staff. Staff in the main used print-based learning guides and face-to-face contact hours in the traditional form. However, the production and distribution of the ITSM Discipline virtual learning guides, combined with virtual lectures, moved the computing and information technology subjects one significant step towards the original flexible and multi-modal goal of Chancellery.

Such multi-modal approaches of learning and teaching meant that production of learning materials further encouraged flexibility by students who could study at any time, with full access to all content materials, if they were unable to attend campus-based classes. This raised the issues of learning guide version control and of learning materials for students not attending campus classes. To remedy this issue, modifications to published materials and files could not be done until the close of the teaching semester, however, supplementary materials could be provided at any time online with students notified in classes and online files.

Word processing had become quite sophisticated by 1997/8, allowing the inclusion of hyper-linked, ‘hot linked’ headings and key words within documents. Assessment items and tutorial workshops became the main points of classroom contact with the students. Tutorial workshops remained well attended in the main as a place for socialising and for exchange of questions and answers normally provided by the ITSM Discipline staff. Lectures, on the other hand, had reduced to less than 5% of students attending.

By the close of 1998 all the learning materials for the ITSM Discipline were available in online/virtual mode. Having this success led to my experimentation with several virtual lectures for selected subjects. Face-to-face lectures were already being captured on video for subsequent review by students via library reserve and by 2000 in online mode. However, the size of the equivalent data files prohibited the telecommunication network distribution of these materials at the time. As a design alternative I decided to capture the transcripts of the lectures and to append the lecture slides with the edited transcript and to attach audio clips, making use of human computer interface standards of the time (Baecker et al 1995). Therefore the
first virtual lecture was a collection of PowerPoint slides with attached transcripts and audio clips.

This kept the files to a manageable size and meant the students could copy them at any time from the Swinburne Lilydale computer network. Each slide contained the key points relative to the learning objectives being expressed. The typical lecture consisted of approximately 30 slides. The virtual lectures, combined with readings and exercises, provided the learning materials a student would preview before attending a classroom-based workshop tutorial. To augment the virtual lectures, face-to-face lectures were also conducted up until 2000. Some students continued to express their preference for the later. At the time of the lecture less than 5% of students attended, with most preferring to use virtual lectures, leading in 2000 to the withdrawal of face-to-face lectures for the level 3 subjects and some level 2 subjects (the level here approximates to the year of study of the full-time students).

It was one thing to introduce these changes but it was also necessary to make sure the environment was appropriate and conducive to such change. What learning preferences did the students have and would they use the virtual learning guide and lectures? The substance of the first paper presented below is included as a response to these questions. This paper was written in 1999 following my review of the curriculum development project. It was presented as a part of the Swinburne Lilydale Working Papers.

LCI101 (Information Methods) is an undergraduate core subject compulsory for all students undertaking studies at Swinburne University of Technology, Swinburne Lilydale. The subject has two Modules:

- Information Technology Literacy;
- Informatics (Inc. Information Literacy)

and is taught in the sequence of Module A as a prerequisite of Module B. Initially (1998) the course was developed to be delivered in a traditional model of face-to-face lectures with students responsible for their own notes and printing of the computer based learning guide, etc. In 1999 the modules were redeveloped into a format that allowed students to access all written materials via the Intranet as a means of pre-reading the materials prior to traditional delivery of the same materials. Late in 1998 a research project (Learning Edge) was initiated to develop learning materials for delivery in a virtual learning environment using computer-assisted delivery at Swinburne University of Technology, Swinburne Lilydale.

A research approach was developed to investigate student responses to using a computer-assisted virtual lecture and learning materials delivery approach in combination with or in place of other available forms of content delivery. The research conducted surveyed a small number of volunteer students who had studied the LCI101 subject in semester two 1999 using traditional face-to-face delivery and video-based approaches. Briefly, the outcome of the study indicated that there were two approaches that students would use and prefer to be available as a flexible and multi-modal learning environment. They were:

- **Face-to-face, traditional lectures, with computer-based learning materials available for review prior to the lecture;**
  and

- **Virtual lectures and learning materials as Computer-assisted delivery, with inclusion of audio clips at frequent points in the material.**
Two video-based options were also presented; however, the students surveyed saw these options as less desirable than those above.

1. **Project Background:**
Globalised markets, reduced budgets, and instructional technology developments using multimedia, etc, are driving educators (in my case higher education) to rethink development and delivery of learning and teaching materials. These drivers also offer many ethical, technological, knowledge and intellectual property issues that will require resolution. The Learning Edge research project, one stage of which is reported in this paper, is one aspect of an Action Research approach to curriculum development for a series of subjects. In particular a new subject (LCI101 Information Methods - Swinburne University of Technology, Lilydale) that has an innovation of several extant bodies of knowledge and as a consequence of the research is now being delivered using a mixture of traditional delivery and computer-assisted approaches.

There are three perspectives that frame the overall research project and they stem from the tripartite relationship of social, informational, and systemic aspects of instructional design theory (c/f. [14]).

- From the sociological and ontological perspective, what approach should be enacted particularly in relation to research ethics and stakeholder participation?
- Pedagogically, what instructional technology will satisfy the learning style and aspirations of a flexible, multi-modal learning environment?
- When implementing any systemic change for the learner and learning environment, what management and organisational aspects should be enacted?

The research framework for the Learning Edge project requires an approach that accounts for these perspectives and the various data collection methods
while maintaining the integrity of the developer (researcher) and the participants of the project. Due to the fact that the developer of the project also conducts the research and that the project is concentrated upon a single case as an ongoing learning and curriculum implementation, an *Abbreviated Case Research* approach is used for development of the overall project, with the data gathering methods appropriated are framed within a *Case Study* approach (c/f. [6], [17], [20], [22]) for the stage reported in this paper.

However, before discussing these perspectives, questions, and the informing theories (Sections 5 and 6), it may be advantageous to describe the project (Section 2) and the specific outcomes of the LOTUS Learning Space study (Section 3 and 4). Also, to note that in taking a case research approach that this approach has many stakeholders who may well have totally different sociological, ontological, technological and systemic approaches that need to be accounted for.

2. **The Learning Edge Project:**
Late in 1998 the Learning Edge project was ceded, with the express purpose of investigating and developing learning materials, delivery and development approaches capable of making use of virtual learning spaces, multimedia and information technologies, flexible and multi-modal delivery. Secondly, to innovate extant information and knowledge within a higher education framework and to innovate new knowledge as constructivist expressions of extant knowledge suitable for undergraduate and open learning studies.

The project to date (i.e. December 1999) has concentrated upon the subject contents, web-site navigation and materials presented by the staff of the Computing & Information Systems Discipline at Swinburne University of Technology, Lilydale. While this paper is reporting a particular study of LCI101 there are twenty other subjects that form part of the overall Learning Edge project. The bulk of content taught in these subjects clearly falls under the heading of extant material (eg. programming in C++, where teaching is focused on basics and the C++ programming language) and as such has all the inherent intellectual property problems. Textbooks exist and in the most part
so do the teaching materials, both written and computer-based, at many university campuses.

It should also be said that we are only one out of many groups who have synthesised extant knowledge for learning materials. This raises the ethical question of who owns knowledge, however that is a wider debate not taken up in this paper. Further, the subject (LCI101) has an educational philosophy not taught widely within university campuses and therefore provides an ideal learning material to be tested using various instructional designs with impunity. The subject draws together extant knowledge, however, as an innovated new expression of knowledge about informatics, information literacy, methods of communicating and thinking about information. The technologies are not new, however, the way I am using them is novel. There is a specific look-and-feel approach taken which is unique to the navigation and presentation of the materials.

3. Data Gathering Framework and Outcomes:
This paper only records a study of the specific application of the instructional technology (LOTUS Learning Space) one part of the Learning Edge project investigations and a direct application of the research methods selected.

The stakeholders (academic, student, and student union representatives) were identified and given the opportunity to participate in a study application of the Learning Space technologies - using the Information Methods (LCI101) subject content taught in semester two 1999.

1. As a study involving human resources, the next step was to seek ethics approval for data collection within the Swinburne University Ethics guidelines.

2. Being a non-lethal nor psychologically detrimental application of the technology a consensus approach, using a practical workshop, survey and focus group, was constructed having gained permissions to proceed and having asked for volunteers from the student community and the Student Union (at Swinburne Lilydale).
3. The studies’ practical workshop was established and each participant was asked for formal written permission to proceed. Participants also received the survey and focus group questions at the outset of the study. These actions allowed a participant to withdraw at any time throughout the conducting of the study.

Selected Survey Questions and Survey Results:
Some interim results on virtual learning using the LOTUS Learning Space technologies and the Information Methods (LCI101) subject learning materials are as follow:

Survey Question 5
Have you used electronic learning methods before? N / Y
(E.g. learning materials for computing subjects using G: drive, etc.)

Survey Q5 Results
(n=11)
NO = 0     YES = 11

Survey Question 6
Have you used electronic lecture materials prior to this trial?
Video N / Y  Video on demand N / Y  Computer-based training N / Y

Survey Q6 Results
(n=11)
NO = 4  YES = 7  |  NO = 8  YES = 3  |  NO = 3  YES = 8

Survey Question 7
Having now reviewed the Computer-Based Training materials Information Methods, please rank the following options in order of your preference of delivery:

Your ranking,

a) Computer Based Training WITH voice clips ______

b) Computer Based Training WITHOUT voice clips ______
   (i.e. Notes only)

c) Face to Face lectures of 1½ hours at set times ______

d) Video on Demand ______

e) Video ______

f) Other (please specify)______________________ ______
Survey Q7 Results
(n=11) there was no response for (f) therefore:

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<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
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<td>1</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>MEAN</td>
<td>2.82</td>
<td>3.45</td>
<td>2.27</td>
<td>3.09</td>
<td>3.36</td>
</tr>
<tr>
<td>STDEV</td>
<td>1.72</td>
<td>1.44</td>
<td>1.19</td>
<td>1.38</td>
<td>1.29</td>
</tr>
</tbody>
</table>

Survey Q8 Results
(n=11)
NO = 3 YES = 8

Survey Questions:
Q9 Would you be likely to make use of CBT from home if you had/have appropriate technology?
0_____1_____2_____3_____4____5
No Some Yes
Q10 How would you rate yourself as a World Wide Web and web site user?
1____2____3____4____5
Beginner Advanced
Q11 How interesting did you find this web site?
1____2____3____4____5
Not very partly very
Q12 How long did you have to wait for this site to appear?
1____2____3____4____5
Too long worth waiting for not very long
Q13 How would you describe the overall design of this site?
1____2____3____4____5
Disappointing Useful Exciting
Q15 How would you rate the overall information contained in this site?
1____2____3____4____5
Not useful somewhat Very useful
Q35 Do you like using the web as a learning tool?
1____2____3____4____5
no sometimes yes
Survey Results
(n=11) Q9 Q10 Q11 Q12 Q13 Q15 Q35
MODE 5 3 4 3 4 5 5
MEAN 4.18 3.18 3.78 2.64 3.40 4.20 4.45
STDEV 1.54 0.98 0.67 1.21 0.97 0.79 1.21

4. Study Analysis:
The study was conducted, taking approximately 100 minutes with 11 participants. The results were compiled, and are of interest in terms of a consensus approach to virtual learning verses face-to-face teaching in a formal lecture format.

Significant in the above results is the strong desire by the participants to use the web as a learning tool (refer Q35 above). However, there was an equally strong desire, expressed in the focus group by some participants, to only have face-to-face traditional instructional delivery. The data reported above further suggests that a preference is expressed for face-to-face learning materials delivery (refer Q7 above) on the one hand, and with virtual lectures and learning materials as an alternative or adjunct approach (refer Q7 and Q35 above). Of interest is the particular virtual learning environment selected i.e. computer-assisted learning (with audio clips). It is notable that some confusion may rest in the understanding by the participants as to the similarity/difference in electronic learning methods (refer Q5 above) and computer based training (refer Q6 above).

These results have informed the Semester One 2000 implementation of an instructional technology that has been purpose build for the Learning Edge project (Elegant Solution). The computer-assisted environment consists of virtual lectures and learning materials all contained in a dynamically linked web-site that is only accessible by students enrolled in the subject/s (there are twenty subjects in the Learning Edge project library). The subject web-site is password protected. This has provided a level of security that enables us to include publisher materials as permission is granted.
Each subject manager has access for upload and maintenance of their learning materials and lectures as required. All materials are developed using the Microsoft Office products (Powerpoint, Word, Access, Excel). Each of these is readily available to students either on campus or via the Internet (over 85% of LCI101 students have a home computer and 70% have Internet access at home). The virtual lectures are nothing more than PowerPoint slides with embedded audio clips (recorded by the lecturer at their desk using a AUD130 microphone and high quality sound card option). All audio has a transcript available for use by hearing and visually impaired students.

The home page for LCI101 encapsulates the structure of the overall web site. The learning materials are stored in two interrelated but independently accessible points on that page. Firstly, access on a sessional basis where material is temporarily administered (e.g. a session could be a week’s work, or one lecture, etc.). Secondly, access on a Module/Topic basis where knowledge modularity administrates access. This implementation forms the next stage for investigation and reporting, however, all this development must be framed appropriately, the subject of the following section.

5. **Ontological Position:**

The overall research project is framed and must be supported by theories that account for the human aspects of the project. The developer, as researcher, sought change management and ontological theory/s that would be inclusive of all stakeholders and, as human participants were involved, provide a framework for ethical technological and ‘studyation’ implementations and subsequent data collection and analysis.

With these preliminary thoughts in mind the starting point is for theories that account for the human aspects as ethics and participatory theories. There are a number of ethics and emancipatory theories that consider the impacts of and on individual and/or group actions. Principally, the theories express two broad categories: **teleological** (i.e. end or goal based) and **deontological** (i.e. obligation based). There are many references that discuss these theories (c/f.
The Learning Edge project takes the theories that pertain to a deontological approach, i.e. where the researcher or individual is obliged to account for their actions relative to other stakeholders.

Aristotle [1] is quoted as saying that ethics is a ‘practical’ endeavour, which gives us practical knowledge. Finnis [8] suggests that he (Aristotle) meant that one does ethics properly, adequately, reasonably, if and only if one is questioning and reflecting in order to be able to act, i.e. in order to conduct one’s life rightly, reasonably, in the fullest sense well. Living and acting in a normative approach developed by society itself. Therefore doing ethics is reliant upon a seeking of knowledge not only for its own sake but also as a basis of options for actions.

Just because an action may be practical does not of itself make it moral or ethical. These words act as a deontological approach, which places the obligation upon the individual without regard for cultural moseys or laws, and which considers all aspects from an obligatory perspective. In other words neither global nor cultural issues are actioned above the individuals obligations.

These considerations, for example, act upon the use of intellectual property that may be seen by some as a right where others would have no compulsion in taking and using ideas with no thought of the rights of the individual or corporation. Importantly these considerations act upon the researcher’s current work of developing learning materials for use in a virtual learning web site and CD-ROM based production, the development of a navigation routine and page layout for a multimedia product which are new and novel intellectual property, etc.

The second and arguably more important aspect relates to the students who will use the virtual lectures and learning materials. It would be all too easy to implement these changes to the student leaning environment without any consultation or consideration i.e. a teleological approach. However, if the researcher implements these technologies, without understanding the impact
on different or individual learning styles, the impact on the student could be
detrimental to their learning and therefore their future.

5.1. Identifying Stakeholders and Actions:
As these relate to the project it is necessary to identify the stakeholders both
proximate and distant. Enid Mumford has spent a considerable amount of
time and research effort investigating socio-technical aspects of organisational
and technological infrastructure development. Mumford’s work in part
provides the basis for naming stakeholders as participants in the project.
Mumford’s approaches (c/f. [18]) could also be said to have a deontological
emphasis of obligation on the part of the developer. In short, Mumford
suggests that anyone affected by a change in a system should be involved in
the process of change, this being supported by emancipatory theories (c/f [9],
[18]). In setting out to identify the stakeholders I have looked at two main
classifications: firstly, ‘development’ and; secondly, ‘usage’. Each will have
different ethical and socio-technical aspects eg. Intellectual property, social
and cultural sensitivity.

Stakeholders identified to date for - development:

- Author/s [extant knowledge, new knowledge, referential works, etc.];
- Developer/s [web sites, navigation, art works, texture, etc.];
- Publisher/s [texts – hard copy, electronic, etc.];
- Teacher/s and Learner/s [study and testing of products on participants, etc.]

Also, identified to date for - usage:

- Swinburne students who use the learning materials developed
either in part or as a whole depending upon access rights and
computer and communications technology.

Further there are a number of ‘stand-out’ aspects of development that require
obligatory action on the part of the stakeholders eg:


- Information acquisition;
- Information access;
- Information stewardship;
- Ownership and intellectual property;
- Accuracy, reliability, completeness;
- Social impact (cultural and global).

Equally, if we are to look at the wider spectrum of issues, then not only the pragmatic but also those issues like:

- Should leaning be conducted using multimedia technologies;
- Consideration of disadvantaged groups, cultures, peoples;
- Knowledge ownership;
- Industry verses institutional based learning and teaching;

must be considered.

Given the foregoing thoughts, it is important to take each of the stakeholders identified and pose qualitative and quantitative questions that test each stakeholder group relative to each obligatory attribute. Given also that many issues and attributes are and/or can be an operation of individual choice rather than overtly damaging or lethal to the individual, then consensus will play a significant role in the ultimate development and change outcomes.

6. Future Research Actions:

Having these results, the next phase of the research project is to further investigate computer assisted authoring and delivery technologies (LOTUS Learning Space, SwinNav, Microsoft). Also, to make the LCI101 Learning Materials available to all new students (approximately 600 studying LCI101 in the year 2000) as traditional and/or computer-assisted (with audio clips). Students will be able to self select either or both methods as part of their study regime.

Secondly, further surveys will be used pre and post students studying the subject, as empirical types of study cannot be conducted with sufficient

7. **Conclusion:**
To what extent is the computer-assisted learning phenomenon moving the learner closer to the precipice of ‘senseless learning’? This precipice is seen as a danger not to be ignored. Therefore how do we reverse what is ominously like ‘senseless learning’, observable where the learner is focused upon computer delivered information (know ‘what’ or content) at the expense of the more holistic knowledge (know ‘what’, ‘how’, ‘who’, and ‘why’). Questions that should be considered during the research include – ‘does delivery mode impact comprehension and motivation?’ And - ‘do the computer based or face-to-face (traditional) approaches or some other combination, relevant to learning styles, provide a longer retention rate of difficult material?’ As such, this requires a review and/or development of learning theory that accounts for virtuality, digitisation and telematics, to act as a framework for development of Digital Instructional Design.

8. **References:**

All references cited in this paper are presented at the end of this folio.
3.4 Introduction of Learning Management Systems

Learning management systems were not new at the time, in 1999; they had been available internationally for more than a decade but had not been used at Swinburne for more than basic student management. By 2000 the ITSM Discipline learning materials were fully virtual (computer-based and web-based) and work was progressing on the development of virtual lectures and virtual classrooms. Distribution of learning materials online remained an issue, as did the necessity for students to print the learning materials, making the use of the virtual learning guide and virtual lectures problematic for students. It was at this time that I visited the Lotus Corporation in Boston USA and discussed learning management and knowledge objects with David Merrill (a widely published and respected researcher of virtual learning approaches). On return to Australia I was able to start an investigation into combining the virtual learning materials that were already well advanced with the Lotus Learning Space – learning management system, the product Merrill was consulting to.

Shortly before these events the University had instituted a Learning and Teaching Support Unit with the express brief to develop flexible and multi-modal learning options and strategies. The Learning and Teaching group and I, through a jointly funded investigation, developed the Lotus Learning Space learning management system while at the same time assisting in the development of a Swinburne learning management product called Elegant Solution. At the outset both of these were problematic solutions, but did enable prototyping with learning template (Section 3.7) designs. Such prototyping was constrained by the proprietary product limitations. There were specific criteria that I had set for any learning management system which were difficult or impossible to provide via the Lotus product. These were:

- that the student should easily and intuitively navigate from anywhere to anywhere within the learning materials and the website with high traceability and visualisation of knowledge;
• that the lowest possible computer and telecommunication profile must be used given that students may not have the newest/fastest/biggest computer or network connection; and
• that human computer interface and student disabilities be considered (e.g. visual, hearing, mental).

When using the Lotus product it became obvious to me early that the software was overly expensive and that you had to work the way the technology wanted. It was not flexible, intuitive or human oriented. Lotus Learning Space managed learning and learning materials in a very traditional hierarchical file management system. However, it did manage student access and assessment well. Nothing much has changed in file management since beginning the study of proprietary learning management systems over the five-year period reported in this folio. Elegant Solution was sufficiently developed and malleable for me to develop the first generation ITSM Discipline learning environment and template as a web-based resource.

Figure 3.1  LCI101 Information Methods, Subject Home page 1999/2000.
With an implementation of the web-based learning management came the problem of visualising a subject in other than a book or file artefact (the common metaphors at that time). I designed a replacement learning materials specification template that became the basis for construction and publication of the ITSM Discipline subject websites. The template was to use the subject web-site home page to express the substance of the virtual learning guide and to adopt a ‘dynamic linking’ paradigm that I had previously designed for the learning materials navigation. This was combined with essential human computer interaction principles, i.e. consideration of disabilities and technology limitations.

Students adopted the learning materials delivery approach readily with the virtual learning guide becoming standard procedure for all subjects in the ITSM Discipline. Some years on and the ITSM Discipline is the only undergraduate discipline to have all learning materials available with online websites supported by virtual lectures and combined with classroom-based study. The virtual is combined with the face-to-face, as students in the main have indicated preference to socialise in a classroom situation (refer Paper 1).

In 2001 the University decided to withdraw the Elegant Solution learning management system in favour of one or more of the proprietary products available at the time that had been partially implemented some years earlier within Divisions of the University. The two chosen were WebCT adopted as the learning management system for the Swinburne TAFE (Technical and Further Education) Division, and Blackboard, used by two of the Higher Education Schools of the University. This meant a review of the learning template to make use of the lessons learnt to date and the constraints of these products if used with their simplistic file management focus on learning.

It was at this time (late 2001) that student surveys conducted by Swinburne and examination results satisfied ITSM Discipline staff that the students were familiar and happy with the learning approach and the virtual learning materials and that there were no negative learning outcomes. Significantly the revelation was, through class attendance, that study behaviour had changed, and that many students were now fitting their learning around a lifestyle of working at home and undertaking paid
work in various industries. Underpinning this was an increasing pressure upon students to undertake paid employment while studying (McInnes et al., 2000). Virtual learning environments were seen as a means of supporting this imperative. The technology was working but I had done little with how to incorporate active learning pedagogy.

These observations led me to undertake a wider review into pedagogy, learning approaches and learning environments that were conducive to students learning. My review led to the decision that active learning approach of Meyers and Jones was the most probable pedagogy for success in the ITSM Discipline. In essence the Meyers and Jones (1993) approach offered a collaborative and constructivist paradigm that could integrate well with the learning technologies and the flexible, multi-modal and multi disciplinary approach that Swinburne Lilydale was professing. ‘Active learning’ advocated learner-centeredness and allowed for blending of other relevant learning options such as work-integrated and problem or case-based learning.

### 3.5 Bachelor of Technology

Simultaneous to the above investigation of learning environments was my design and the accreditation of a replacement undergraduate degree program for the ITSM Discipline that would account for the plurality of vocational and self-directed learning outcomes. A liberal, multi-disciplinary approach was required in line with Government and University policy at the time. My design is presented in Paper 2 below as extracts (section – Rationale and Objectives, Features of Significance) from the Bachelor of Technology Accreditation documentation that I authored in 2001 for introduction semester one 2002. The extracts are indicated by a bold line down the right hand margin of the page.
Rationale and objectives:

The project will provide, for the first time, an inter-sectoral multiplexed degree program with a coherent suite of subjects including major and minor studies, and progression toward a degree for students entering study either via TAFE or Swinburne Lilydale Higher Education Divisions.

The program aims:

- In the first instance to develop an inter-sectoral course conceptual framework that draws material from both the TAFE and Higher Education subject offerings, with students moving freely between the two Divisions at appropriate levels of study;
- To provide a multiplexed Bachelor of Technology degree that allows multiple exit points (Exit points – Certificate, Diploma, Degree), for students having entered through either division;
- To graduate students that meet the needs of the IT industry particularly in designated areas of shortage as outlined in recent National Priorities documentation. (http://www.noie.gov.au/projects/ecommerce/skills/index.htm)

The objective of the course is to educate students in the generic and technology discipline specific skills so that a student successfully completing the course is employable in the technology industry. Students will also be equipped with life-long learning skills and capable of making a significant contribution as leaders in technology and related industries.

The proposal is for a degree that will be seamless across the Higher Education and TAFE Divisions of Swinburne University. The core majors for the proposed degree are Information Technology and Software Engineering, Information Systems and Interactive Multimedia. Some portions of some of
the subjects will be taught at TAFE with the Higher Education division providing subject material not covered at TAFE.

The proposed degree structure emphasises the importance of facilitating smooth articulation both between the TAFE and Higher Education divisions and also reverse articulation for students between Higher Education and TAFE. A central design feature of the program is to allow any student of the Multiplex degree to leave the program with a relevant TAFE qualification that requires minimum additional work at TAFE level. It should be noted that there are no new subjects required and that the learning materials remain in an online and flexible mode for students.

Students completing the course will possess a balanced, vocationally orientated qualification which:

1. Consists of studies in at least one of the four aspects of technology as well as the opportunity to undertakes studies in other disciplines of their choice (for example, accounting, marketing, tourism, sociology). It is anticipated that students will complete a minor study in one discipline other than Information Technology, Systems and Interactive Multimedia, consistent with the multidisciplinary nature of the degree and industry requirements;

2. Incorporates aspects of theoretical and practical technology, computing, information systems development and application, management, human-computer interaction, professional conduct and communication;

3. Provides opportunities for work integrated learning (as either IBL or project-based);

4. Recognises the changing nature of the workplace and technology disciplines, training students to investigate and manage change and understand the impact of technology on society;
5. Provides the foundation for graduates to become future leaders in Australia’s technology industries, and/or businesses and organisations

6. Incorporates ‘state of the art’ skills for technology, systems development and management as well as a balance of existing approaches necessary to apply computing in the modern organisation environment.

Any features of significance

There are three co-operating concepts to be considered when thinking of students progressing through this degree program:

The first is multiplex (or multi-part) – where the study program is constructed from many parts drawn from both TAFE and Higher Education:

- This concept is concerned with the entry and exit points for the degree: Students may enter via TAFE or Higher Education in the first instance and, it is proposed, will study in exactly the same format. They will be enrolled in the degree from the outset, or;
- Students may enter a normal certificate or diploma program through the TAFE but study with the intent of entering the degree program with 100 percent credit. This will mean that students must study the equivalent degree subject content as part of the certificate or diploma, or;
- Certificate or diploma students may enter the degree program with Recognition of Prior Learning status, as is currently the case. However, 100 percent credit cannot be guaranteed due to the possibility of mismatched subjects and studies.
Similarly, students wishing to effect a reverse articulation may be required to undertake further TAFE studies in order to qualify for a TAFE certificate, diploma or other TAFE qualification. This will give opportunity for students to exit with a qualification and encourage re-entry at a later time.

The level of TAFE credit towards the Higher Education degree will be equivalent to that provided for other degree programs. Importantly, however, the pattern of credit is different. Students completing the Bachelor of Technology course of studies will have proven themselves in terms of vocational and higher order cognitive skills. Graduates will have credentials to perform effectively in their chosen industry sector and/or to undertake higher degree studies.

The second concept is concerned with matching study programs. Both TAFE and Higher Education currently provide courses of studies broken into subjects with each subject consisting of various learning modules and knowledge objects. The Bachelor of Technology however, is to be viewed in the first instant as a tapestry of knowledge objects where one or more knowledge objects constitute a learning module. The modules are then woven together into subjects and courses of studies. Each knowledge (learning) object consists of learning outcomes experienced in terms of competencies,
concept, critique and context. “Knowledge objects are containers consisting of compartments (slots) for different related elements of knowledge.” (Merrill, M.D., 1997 Instructional Transaction Theory (ITT): Instructional Design Based on Knowledge Objects, in Reigeluth, C.M., Instructional Design Theories and Models: A New Paradigm of Instructional Theory, Lawrence Erlbaum Associates, Mahwah NJ.). While the behavioural aspects (competencies and concepts) are often expressed for both TAFE and Higher Education studies, the cognitive aspects (critique and context) are often overlooked. This is to be remedied by emphasising these aspects in the Higher Education studies.

**Thirdly**, in relation to the Bachelor of Technology, all subjects in both TAFE and Higher Education are to be expressed as knowledge (learning) object with specific learning outcomes for competencies, concept, critique and context, augmented with pre-tests. The pre-test offers a vehicle for Recognition of Prior Learning for the Bachelor of Technology, i.e. it is not assumed that Computing Fundamentals is the same the world over, however, specific knowledge can and should be recognised and credited as part of any subject.

The degree emphasises conceptual, critical and contextual thinking, where competencies form an integral part of the conceptual level of studies and where abstraction and self-directed higher learning epitomise the critical thinking level of studies.”

### 3.6 Virtual Learning the Third ITSM Generation

The design elements of the Bachelor of Technology program combined with the active learning approach and advanced web-site navigation, WebCT learning management system and Dreamweaver presentation software, culminated as the foundation of the ITSM Discipline learning environment. The proprietary browsing and learning materials accessing approaches of the WebCT learning management systems were not designed to take account of the dynamic navigation implemented in the previous generation of the virtual learning guide. Therefore an interface layer using Dreamweaver application development software was considered.
Several learning management system Options as mentioned (WebCT, Blackboard, TechniCal) were tested. TechniCal was easily rejected due to its very brittle nature when tested and because of the antiquated file processing metaphor used. TechniCal was to be implemented throughout Swinburne Lilydale as a test site for that product. The ITSM Discipline were given permission not to be part of that test on the grounds that we were advanced in our use of learning management and that we were to cooperate with the TAFE Division in the provision of some learning materials for the new dual sector Bachelor of Technology program. The TAFE Division was already using WebCT; therefore the reasonable choice was to align with that platform. Blackboard was also not a viable option, as Swinburne Lilydale did not have access to that technology at the time.

I looked for commercially available software that could improve the intuitiveness of navigation of WebCT and provide the interface between the technology, the active learning approach, and the students and teachers. One such technology, for information navigation and visualisation came from my studies of information forensics, i.e. hyperbolic visualisation. The location of the visualisation approach then led to a commercial product called ‘Star Tree’, provided by Inxight software and to be embedded within a Dreamweaver interface built by the ITSM Discipline technical staff.

Inxight software (www.inxight.com) state that their product provides:

… an enterprise solution for structuring text data to improve access and use. Organisations are now offered a comprehensive solution for managing all data, with the ability to utilise visual navigation capabilities for viewing and interacting with textual information extracted and organised through Inxight, as well as data contained in traditional databases. (Ibid.).

The product created “graphical visualisations enabling users to easily explore and quickly find what they are looking for” (Ibid.)
The criteria that I assigned for implementing the ITSM Discipline learning environment using WebCT and Dreamweaver were that it should be:

- **Intuitive**: Very easy to navigate and visualise the learning materials;
- **Inclusive**: Make allowance for various levels of ability and disability, including visual, hearing, physical and mental;
- **Intentional**: Having a well delineated purpose for student learning;
- **Innovative**: Make use of the best research and development approaches and technologies;
- **Informative**: Well structured, information rich and well presented learning materials.

Each of these criteria drew upon the best available information and standards being developed for human computer interaction (e.g. W3C guidelines for visually impaired – [http://www.w3.org/wai/](http://www.w3.org/wai/)).

For the most part I did not seek complex multimedia and video-based materials for students. When constructing virtual lectures, for example, the requirements were simply to have information and narrated PowerPoint slides with the key points and good explanation. The narration was to be contained as narrative transcripts and as voice clips. At the start of each virtual lecture there was to be a short, video-based, introduction clip so that the student could associate the balance of the lecture with the real person presenting the learning materials. While this has not been empirically tested for effectiveness with ITSM Discipline students it seemed to work well and students did not request the full video production of lectures. They also knew that these were available from the library where usage was less than 5% of students presenting for a subject. The benefits to the student of this approach are the ability to review easily any part of the lecture slide by slide and the size of files are kept to a minimum, increasing the speed of access for students studying off campus.

Signor (2003a) has studied the ITSM Discipline use of virtual lectures for one subject and had concluded, from this study of the student responses and examination results for that subject over a three-year period, no impact either positive or negative, was recorded in student surveys or examination outcomes. However, the students did complain loudly if the materials were not promptly put on the subject web sites.
3.7 ITSM Learning Template

The ITSM Discipline learning template (second generation), implemented in the above virtual learning environment, provided a more dynamic and inclusive approach for ITSM staff constructing learning materials. It also provided a greater challenge for thinking about the learning in multiple dimensions. The template provides for two levels of learning instructional design.

The first and structured level (Learning Objects) is the recording of competency-based and concept focused content. Competencies or skills are an integral foundation if students are to undertake constructive and critical thinking, and provide the discipline specific and generic competencies required by quality learner-centred education (refer Chapter One - Government policy). An object-oriented approach was applied to this level of learning materials construction. Object-orientation (refer Zimmer, 1998) allows for smaller self-contained reusable modules that will have little on no changes over time. Essentially, the learning object captures the curriculum elements that are performance oriented and static in nature.

The second or dynamic level (Lesson) focuses the learning and teaching on complex and contextualised problems and cases. A lesson will develop the constructive and critical abstraction capabilities of the students. Key terms and specific knowledge can be highlighted and attached through links to learning objects. As can be imagined, the lessons are far more dynamic in nature, allowing learning of skills and concepts across a vast multitude of disciplinary topics. Lessons can also be levelled (i.e. introductory, intermediate, advanced) and can be used to draw together many concepts within multiple real or virtual worlds or problematic contexts.

Appendix 1 contains a snapshot of one subject (LEB310) developed using the lesson-learning object approach. This model differs from others reported in literature in that there is a dissection between surface learning and deep learning in the way materials are presented and actioned, i.e. there is essentially two levels of learning-object. (cf. SCORM, IEEE Learning Technology Standards Committee).
A significant positive effect in creating the ITSM learning template was the provision by the ITSM Discipline staff of a far more holistic collection of learning materials including content, contextualised case work, virtual lectures and study guidelines. For staff a more collegial model of working was initiated as more similar materials were shared as resources for learning and revision. For a detailed analysis of this approach refer to Moore and Wallace (2003).

3.8 Reflective and Collaborative Approaches Implementation

The ITSM Discipline employed two further procedures during 2002. Reflective journals and collaborative (team-based) approaches were selected in direct response to the active learning pedagogy of Meyers and Jones, where they encourage the use of journals and teams as learning mechanisms. The reflective journals were implemented in the first semester of 2002 but immediately proved to be problematic. They were ultimately withdrawn at the request of the ITSM Discipline staff at the close of semester two 2002. The reflective journals were completed on a weekly basis and were to be analysed in content by the ITSM Discipline staff as a way of finding learning and administration shortcomings and for students to build a resource for assessment preparation and learning review.

The journals were to be seen as a communication vehicle, however this was short lived. The sheer volume of students and the amount of materials to be reviewed meant that the ITSM Discipline hired two reviewers with the specific task of assisting students to develop reflective skills and providing summaries to the appropriate staff member of issues raised by students with regard to their subjects. A point to note at this time was that reflective journals and the new subject web sites were being prepared by ITSM Discipline staff simultaneously and due to the workload something had to give. It was the journals!

3.8.1 Reflective Journals and WebCT Evaluation

The following extracts (Paper 3) are from a review I requested to be conducted in 2002 where I investigated why WebCT and student journals were problematic and therefore why the journals in particular were proving to be of little or no value (refer Appendix 2 for full copy of the report).
3.8.2 Collaborative Learning Evaluation

While the reflective journals approach was seen to have failed, the collaborative and work integrated learning approaches proved far more resilient. These have been functional since I developed the ISTM Discipline in 1997/8. As these team-based approaches were already in place in some form or other they were simply encapsulated within the new ITSM Discipline learning environment. However, I believe there is a more inclusive enculturation to aid learning and self-actualised learning skills. I argue for a participatory model where staff and students participate in larger cases, simulations, research and projects that contain elements of resolved issues that engage known skills and knowledge, as well as unresolved issues that engage problem solving and critical thinking. This enculturation allows students and staff a cooperative but guided learning paradigm. An approach, like many post-graduate laboratories, is where students and staff work on unresolved real-world problems and experiments. The chief difference is that all students and staff, not just problem or domain specific individuals, can engage the learning space, and that the space can deal with larger numbers of students than a traditional postgraduate laboratory.

The following paper which I presented at the WACE 13th World Conference 2003 describes this element of the learning pedagogy and the variables that mitigate a collaborative and work integrated learning approach. Paper 3 that follows is indicated by a bold line down the right hand margin of the page.
Paper 3 - Work and Learning – Flexible Systems, Inflexible Student Choices

By Dr Bruce A Calway

Abstract

Learner directed higher education is a false premise, however learner participation as active learning collaborators is both a plausible opportunity and a strong ingredient for a flexible higher education system. This paper discusses the ongoing longitudinal study of the implementation of a participative and active learning environment that integrates students, teachers, industry, community, information and communication technologies, work-based curriculum and instructional design, learning management systems and classroom contact.

Literature is replete with ‘how too?’ but when considered had very limited replicable or comparative studies. In part my studies and analysis also fall into this scope where comparative studies have yet to be attempted. It is difficult to take a holistic approach due in part to the long lead times required and the inability to isolate variables across multiple institutions. Instead this particular learning environment analysis is best added to the growing quantity of research and be considered as part of a wider ‘grounded’ study or studies.

Introduction

What would constitute an ideal flexible ‘work and learning’ model? For the Information Technology, Systems and Multimedia Discipline (ITSM Discipline) at Swinburne University of Technology, Swinburne Lilydale, Australia, it would be: ‘Real World’ problems and research providing the cases for study while flexible and dynamically linked learning objects (contained within an online learning management system) provide the specific competencies and knowledge at an appropriate level that can be assessed in terms of learning understanding not just prescriptive and rote assessments. The learning environment would be participative and constructive. The collaborators receive real solutions while students receive real reward for
effort and institutions provide real and flexible learning therefore meeting the requirements of a socially holistic and participative learning imperative.

Creation of the above is an ideal participative model, however, such a flexible higher education system is always under threat, under most threat from learners themselves. It almost seems incredible to think of learners choosing utilitarian outcomes above constructive and participative learning however my research has shown this to be a very real issue for the ITSM Discipline staff and students and that the social and student utilitarian learning model dilutes efforts by higher education institutions and teaching staff to create a collaborative, flexible and holistic higher education.

This paper discusses results, from an ongoing study, of ITSM Discipline implementation of the above flexible and multi-modal learning environment that integrates information and communication technologies, student exchange work-based and work integrated learning, learning management systems and classroom contact.

Data collected from student and subject surveys, exam results, assessment items, learning skills inventories, industry projects, and etc., over a five-year period show that the implementation is problematic. Only a small number of students choose studies containing work (real world, problem-based) integrated projects, typically ill-structured or abstract problem situations, most students choosing instead a highly structured and prescriptive instruction approach.

The purpose of this paper is to inform individuals and groups, when developing work-based learning environments and curriculum, that learner-centric agency and mental models are a blunt instrument that can force higher education systems to be highly prescriptive and inflexible, and make it overly difficult to create a collaborative environment. Sad experience, over a five-year period, has shown me that even with good quality industry projects and collaborations, and a good active learning environment and management systems there is no guarantee that students will engage the opportunities,
causing dissatisfaction within collaborators and teaching staff, exacerbating an already tenuous situation.

However, all is not lost, in that with the aid of learning management systems and a work-based learning strategy both the problem solving collaborations and the competencies learning can be enacted within a single flexible system. Whether students engage such a system is a different issue.

Background Discussion
Teachers and students are bombarded by a multitude of voices proclaiming the virtues of one approach or other. Students are increasingly studying and working (i.e. paid work) simultaneously. This means they are adopting the technology as a convenient content acquisition mode for study and are demanding ALL materials to appear in the one online (virtual learning guide) resource and not require them to access multiple resources (e.g. libraries, other texts, papers, etc.). Students remain focused on process and assessment as the outcome of their study. This seems to be because they carry forward their learning enculturation (a traditional pedagogy and social norms and affordance) from secondary college and from societal perceptions of higher education as a vocational prerequisite, and they do not see the relevance of any change to self-reliant or participative learning.

During the period 1998 through 2003 a pedagogy and learning technology innovation was developed and implemented at Swinburne University of Technology (University), Swinburne Lilydale, Information Technology, Systems and Multimedia (ITSM) Discipline. I was the discipline leader for the ITSM Discipline during this period and lived with an idealist illusion, so it turned out, that a flexible and multi-modal learning environment would make an immutable change in students learning and higher education teaching. My optimism in part was fuelled by the plethora of literature espousing constructive, work-based and technology focused learning approaches.

If literature, reporting on integration of work, technology and curriculum, is to be taken at face value there are considerable examples of implementations
with positive outcomes. However, there seems to be an assumption within the research reported that students will perpetuate a self-motivation and constructive learning scenario based upon exposure to such an educational construction alone.

It was during the developmental generations of the ITSM Discipline active learning environment that students were encouraged to be far more adventurous and participative learners in line with the Swinburne Lilydale liberal and work-based learning assumptions.

“… we should look for pupils to be successful in exams of course, but much more than that we should be seeking to turn out young men and women who are hungry for learning, set firm on the track of life-long learning, not utilitarian learning, not ‘just in time’ amassing of facts but a love of learning, a delight in exploring new avenues.”

http://www.hutchesons.org/association/activities.asp, (last accessed 06/01/2003)

However, this has not proven to be the case with ITSM Discipline students who were shown to be choosing a utilitarian learning paradigm above any participative, self-reliant work-based and/or constructive learning paradigm. (This study is given in detail as Chapter Four of the present folio) The studies show that the ITSM Discipline students have not changed in their learning perceptions or learning outcomes regardless of the ITSM Discipline learning environment developments. This came as a shock to the ITSM Discipline and staff given the positive pronouncements in the literature relative to the use of online and work-based learning paradigms. Why was there no change, what is the problem? One reason for this problem could well be:

That the dominant learning and teaching variable (agency) is the perception of staff, students and society of the importance of skills (generic and discipline specific competencies) and that the
technologies and pedagogy will consequently be used in a utilitarian manor to support such an agency.

There seems, to date, to be only sporadic application of constructive strategies and no holistic educative approach for advising educators, who for the most part in Australia do not possess education profession training or qualifications. So educators simply mimic the parent, which for higher education educators is a traditional Lecture – Tutorial “teaching-as-telling” artefact.

While this is at this time a generalisation, the scene is very slowly changing through some educators who are aware of and espouse, a participative and constructivist approach to higher education. However, few are able to implement a holistic constructivist culture due to knowledge and institutional constraints. At Swinburne University of Technology, Lilydale, both the undergraduate ITSM Discipline and postgraduate Centre for eBusiness learning and teaching environment are an exception, albeit still in its infancy with such an ‘enculturation’ model.

We use enculturation here as an active and holistic verb where a sustained cultural context is envisaged. We cannot at this point see a universal participative culture, however, we do:

- Provide and investigate examples (artefacts and people);
- Encourage and orchestrate student/student, educator/student, educator/educator interactions; and
- Directly research, encourage and teach the model espoused through action inquiry.

Tishman et al. (1992) spoke of enculturation this way when they suggested that teaching by enculturation is holistic in nature and that this model subsumes the traditional instruction models rather than replace them.
Enculturation at both the Centre for eBusiness and the ITSM Discipline, as a model, has developed from a goal of self-actualised learning as a social construction that has resulted from complex processes of reforming and improving the education activities of the Centre and the ITSM Discipline. This social construction is measured through change, where changes come from the rhythmic effort of combining theory and practices involved, making the changes and reflecting on what has been learned. This is typical of an Action Research approach (cf. Stringer, 1999) used by education researchers undertaking community-based and/or systematic construction.

Further, self-actualised and Self-directed learning, (cf. Knowles, 1975; Houle, 1984; Hiemstra and Sisco, 1990) affords a number of connotations, from learners motivated in a prescribed and dependent study through to learners generating their study material and path of learning. The former suggests a strong use of dependent learning with the learner environment taking on a high degree of directed action, whereas the latter is far more self-actualised learning where the learner constructs the topic, time, place and pace. Therefore, there is a discernable pluralism as:

- **Self-motivated self-directed learning** – where the learner takes an active part in a structured learning environment. An environment that encourages subjective interpretation of learning within a stimulus contextualisation. It is interesting to note that motivation was not a competency of the original SDL competency measurement instrument developed by Knowles (1975, p61).

- **Self-actualising self-directed learning** – where the learner creates a learning path in accordance with an individual action to create a context or influence an extant context (i.e. construction, Bruner, 1960, 1986, 1990).

In essence, the two are similar in that the learner is making an individual response to learning. However, there is one notable differentiation in that the sphere of individual contextualisation is objective for the one and subjective
for the other. In a survey (using the self-directed learning instrument, http://www.distance.syr.edu/sdlskills.html) conducted of students in 1st, 2nd, and 3rd years of undergraduate study (Calway 2002) students believe they were moderately self-motivated and moderately self-directed. While the academic staff agreed with the students in terms of self-motivation they disagreed the self-direction, suggesting students were low and/or did not understand this aspect. Self-direction of a learner does not seem to be associated with the dependence or independence of the learner, rather we suggest it is associated with the needs (insecure through self-actualised) focus of the learner that need to be met, e.g. independent learners can have multiple levels of self-direction.

The research was induced by two events; firstly, the technology used to distribute the computer-assisted learning to students became obsolete requiring a replacement in first semester 2002. Secondly, observations from prior studies (Calway, 1999, 2000, 2001,a, b) and academics that indicated undergraduate students were not self-actualised or self-directed learners on the whole, whereas postgraduate students fluctuated between a dependency and independence. Also, that the use of online (computer-assisted) flexible learning materials made no significant difference to student outcomes or motivation to learn when compared to other more traditional approaches taken by other disciplines in the same university campus. There existed sufficient anecdotal observations to suggest that, on the whole students possessed a prescriptive and deterministic nature that would be anticipated for a traditional dependent learning paradigm (cf. Grow, 1991/1996), reflected in the lower left quartile.

This has led me to the view that what was being observed ran contra to the assumptions of constructivism in that self-actualised learners seem to be a product of a social construction. This dichotomy could loosely be viewed in terms of Maslow’s hierarchy of needs (e.g. Norwood, 1999) where the student is overtly progressed along a path of objective security to the point of subjective self-actualisation. That is, a traversing from a “not knowing what they don’t know” and insecure as learners to “knowing what they don’t know”
and able to engage self-actualised learning given appropriate conditions (the debate of whether we are a product of a social construction is not attempted here).

**Work-Based Learning**

For Swinburne University of Technology, Swinburne Lilydale there are three dimensions to work-based learning:

Industry based learning (IBL) – where students can engage in a period in industry within a paid position. Each position on placement is for a limited period of six or twelve months duration. Placements are supervised by an industry sponsor and by an academic mentor. All placements are competitive and only available to students with a steady record of credit average or above and who have completed the first two years of their undergraduate degree. The university seeks sponsor industries and manages the student placements for the duration of that placement. Sponsors emanate from a variety of industries and are commensurate with the major studies that students complete. Only 1 to 2 percent of students who would be entering their third year of study would enter industry based learning placements. IBL placements are not for credit toward the students degree, however, there is a statement on testamur.

Work-Integrated Learning (WIL) – not all students have access or results commensurate with an IBL placement, however, all students entering their third year of study have the option of undertaking a work-based project. The projects are sourced by the students and where possible undertaken in small groups of mixed disciplines (e.g. one student form IT, one from Marketing, one from Management to form a group). Projects must be completed by the group within a single semester of twelve to sixteen weeks. No payments are received and no guarantees given that a project will be completed or functional. Students completing the WIL subject are expected to present several assessment items as the project is for credit as a single subject toward the student’s degree. As with IBL very few students make use of the WIL opportunity as a means of gaining work based experience.
Problem-based case studies – Each subject and year level of the Information Technology Software Multi Media Discipline has what is called an active and multi-modal learning environment. This environment is presented through classroom-based workshops/tutorials and web sites. The web site contains two levels of content – the first being a series of learning off-cuts where students gain specific knowledge about a particular topic and/or competency.

The second level is a series of case-based lessons where students are presented with scenarios and cases that required contextual and conceptual thinking if they are to be resolved. The cases are drawn from industry scenarios and are focused at the work-based experience where knowledge and skills will require blending and abstraction to new and novel situations. The lessons draw upon the individual topics and competencies that are designated for that particular case and situation. As best as practical the premise of the learning environment is to provide relevant, flexible and work-based studies. All students studying the ITSM Discipline subjects engage this learning environment.

With these work-based learning situations, presented for each student and prepared by the teaching staff, it would not be unexpected that students would leap at the opportunity to engage in a motivated fashion. The reality is the antithesis of what could be considered self-directed or active learning. Instead students through university administered subject surveys were demanding a prescriptive formulaic process for study. Any attempt by staff to have students explore problematic cases or unstructured assessment around various contextual and conceptual abstractions were met with a resounding “tell me what I have to do to pass”, a minimalist paradigm where the only thing in view is ‘to pass’ the subject without visiting any or many of the learning experiences available.

These observations have been not only recorded in the student subject surveys but also within an analysis of student learning skills inventories. This study, which I conducted during 2002 semesters one and two of all students studying subjects within the ITSM Discipline, showed that students enter the discipline
with a minimalist utilitarian learning mental model and continue that model throughout their time as undergraduate students. This is not to say students are commensurately unmotivated for in fact student’s motivation was recorded as moderate to high in most subjects offered.

This raises the possibility that students, while espousing that work-based learning is of value, do not pursue such activity as a priority when undertaking their degree studies. It would seem from the ITSM Discipline experience that students are strongly focused upon assessment at the expense of holistic learning and work-based experiences. Does this mean that all universities have a similar scenario? In short the answer must be ‘no’ for there are instances within Swinburne and other universities around the world where students actively engage work-based learning environments, however, it must be observed that the total learning and academic culture is work-based as a focus and that there is no escaping short of changing to different universities or faculties. Such proactive enculturation is rarely attained nor are the majority of staff qualified to participate.

Does this mean that students must be forced to engage using every learning motivation, learning skill, learning style, etc? A daunting task if as a teacher all you have ever observed is an instructive mental model for learning. In many ways the fact that students are ‘required to’ do is probably sufficient to drive them to a utilitarian learning approach even in the most constructive work-based paradigm. A study of these aspects is currently under way as a longitudinal analysis of learning environment engagement and design.

IBL in many respects is one enculturation of a participative learning engagement. It is a true partnership of student, teacher and industry sponsors. This model employed by Swinburne presently provides for paid student placements and on a competitive basis for students at the Swinburne Lilydale. Some other departments of Swinburne require that students complete one or more placements as part of the degree studies and as a requisite component of completing an undergraduate degree.
No formal classroom studies are required during an IBL placement nor are there any specified topics or skills development. Rather it is the working out of skills and knowledge acquired during the first two years of formal learning that are actioned. It would be problematic to individualize student, teach and industry sponsor formulized studies due to time and management constraints, however, the learning that transpires has been shown to be more effective.

Where IBL fails is in the very area of assessable learning and competencies. The effort involved to provide assessable industry placements for all students, in all disciplines, is unfortunately not available and perhaps no longer plausible due to the sheer volume of students and the lack of teaching staff and industry sponsors. What are viable however are industry simulations and collaborative industry projects. Again I draw attention to the difference between participative (all parties equally engaged) and collaborative where only students participate with the teacher acting in the form of facilitator.

Some material has been edited out at this point as it is repeated in Section 3.1 of the present folio
Points to notice are that there are structural elements that are determinant. For example, industry is requiring workers; workers who are discipline competent and who possess specific and generic competencies and knowledge. Also, society has established norms and a social construction that in Australia sees many secondary qualified individuals entering universities. Students enter the university system with a desire to gain a degree qualification in order to graduate into society and industry and bring a diversity of knowledge, competencies and constraints. Students therefore enter a highly structured environment. The inherent structure has further been empowered through a university system that has rules and norms that emanate from centuries past. Amongst these norms are the learning structures categorised as ‘traditional’. However, the past several decades have seen individuals researching and
implementing new structures and learning socialisations. This has led to strategies for instructional design (e.g. Romiszowski, 1977; Wilson, 1997; Tam, 2000) that redefine the focus of learning behaviour away from the academic/teacher as the knowledge repository to the student as a self-actualising knowledge creator.

**Active (participative) Learning Environment:**
If the academic accepts the work-based, constructive, self-directed, and self-actualised paradigm and desires to implement it in practical terms, then this alters the role of the student from being a passive participant in the learning experience suggesting this must change to that of an active participation. Rather than knowledge being pushed into a prescriptive form, it is a requirement that knowledge be remodelled into a form that is modular and problem or work-based, contextualised and framed by an industry and disciplinary priorities. A conceptual and strategies model of the learning environment (discussed above) was developed by the ITSM Discipline to express the relationships, entities and attitudes necessary to define the cultural context and approach.

**Summary and Conclusion**
Society, industries and institutions of education do have conceptions of what is expected of higher education as a cultural norm and consequently what teaching and learning constitute within that normalisation. Certainly transference of competency focused knowledge and skills loom large as do outcomes in the form of degrees, graded subject results and the like. However, there is a tension in teaching and learning between educational method and methodologies (e.g. cognitive vis-à-vis competency schools of thought). The question is whether there needs to be a heightened emphasis on the participative and self-directed learning skills, such as research, and problem-based or a real effort to inhibit minimalist, rote and purely utilitarian learning.

A further tension being between students and teachers, where teachers may well be seeking to engage students in learning experiences not just the transmission of knowledge and competencies, and student’s simplistically
demanding “what do I have to do to pass?” Essentially though a utilitarian and minimalist, outcomes focused model remains. My studies of the ITSM Discipline have shown the number of students undertaking the subject Work Integrated Learning (WIL - LZZ301) and Industry Based Learning (IBL – LZZ306, 312) relative to the number of graduates. These ratios indicate that very low percentages of students are choosing IBL - < 2%PA, and equally low percentages choose WIL projects - < 5%.

Society certainly plays a large part in the normative generalisation and enculturation of education but would not see itself overtly becoming engaged in the tensions being played out in higher education institutions. Within the Australian context society in general and industry in particular have a vocational ideal for education. This is not of itself good or bad, however it does belie a pragmatic work-based imperative that prescribes for students that results for subjects studied and degree qualifications are more important than the disposition to learning and collaborative participation. Those who seek to have students consider life-long learning as the imperative and participative learning characteristics as normative have questioned this.

Combine the above; the introduction of work-based constructive pedagogy, liberal arts, information and communications technologies, and learning management systems, (that can be used to deliver content and learning materials anywhere, any time and at any pace,) and there is no guessing what the outcome will be other than the obvious minimalism by all parties.

The reference list for this paper is contained as part of the folio Reference list
3.9 ITSM Learning Environment (at the close of 2003)

Whilst there have been many events and innovations they have not been directed in isolation or without the involvement of students, staff and review. Peer review through accreditation of degree programs, student surveys and more recently staff researching elements of the ITSM Discipline learning environment are examples. 2003 has seen widening scrutiny of the multi-media and virtual lecturing environment (Signor, 2003a and b) and the elaboration of the learning objects environment (Moore & Wallace, 2003).

By 2003 the wider ITSM Discipline learning environment had changed considerably, as far as infrastructure and teaching enculturation, but had retained the essence of the first generation ITSM Discipline learning template approaches. Even after five years the learning enculturation of students remained problematic. The following paper 4 presented in 2003 draws my involvement in the ITSM Discipline learning environment that provided the substance of the 2003 enculturation to a close. This model ITSM Discipline learning environment still lacks reflective responsiveness for students and does not answer the substantive and problematic issues that provide the basis for the study of student learning skills perceptions and approaches (Chapter Four).

The following paper has been subjected to minor editing for the purpose of providing commonality of terms used within this folio. It reflects the substantive questions yet to be answered and provides reasons for hope that we can identify problematic relationships and propose remedial action. The following paper is my substantive work (as annotated) with Associate Professor Helen Paterson providing the case narrative – found in the latter part of the paper. Paper 4 is marked by a distinctive bold line down the right hand margin of the page. This paper was presented at the 16th Australian International Education Conference, Hobart, Australia 2003
Paper 4 - Students and Staff a Shared Learning Journey

By Dr. Bruce A. Calway, with excerpts from Assoc. Prof. Helen Paterson

Text Narrative: (prepared by Dr. B.A. Calway) Case provided by Assoc. Prof. Helen Paterson

Abstract:

“Challenging passive students to be active learners and to practice academic skills does change the rules of the classroom and teaching expectations with which students are most familiar.” (Meyers & Jones, 1993:12) Two decades have seen considerable research reporting and outcomes from studies of “active learning” applications. We present in this paper a study of one such environment.

The case is both descriptive and narrative and records our observations and students anecdotes that have been studied at the Centre of eBusiness and Communication and the Information Technology, Systems and Multimedia Discipline, Swinburne University of Technology, Lilydale.

Highlights include: flexible learning, active (participative) learning, student directed learning, and interdisciplinary and personal learning journeys.

Introduction:

There is a profusion of literature that discusses information and communications technologies (ICT) and its derivations (e.g. online, web-based) and eLearning. Often eLearning is treated as simply another version of online or web-based learning management. However, if we consider the other uses of ‘e’ we find that it refers to other than electronic. Kalakota and Robinson (2001) speak of the transition from a traditional competency based focus to that of a customer focus. Competency here means those things that the organizations, like a university, think they are good at.
It focuses those desiring to use online and web-based approaches very much upon the values of the client or customer. In education this is often mistakenly referred to as learner-centred. We say ‘mistakenly focused on learner-centred’ because the discussion within this paper points to students values actually subverting higher order values such as learning in favour of instruction. This then raises the important question of who is the customer.

In answer to this question we draw upon the socio-technical school of thought (cf. Mumford, Hirschheim & Klein) that suggests that any individual who is affected by a system or change or technology should input to that system or change. This is problematic in that there are so many intrinsic and extrinsic stakeholders in the education system. Also, a point for consideration is the non-human aspects, for example teaching or learning. These are values held by individuals as stakeholders in the education process. So which values are to be considered in the value chain analysis? Learning is an obvious value that has demanded prominence in recent years. Teaching is a value that traditional students and academics would espouse more forcefully.

For this paper we have moved from a learner-centred to a learning-centred value chain. To support this we espouse a participative learning environment (described shortly) and the flexible and multi-modal learning materials using online and web-based ICT support. Therefore we argue ICT as a tool for supporting a holistic eLearning paradigm supported by participative learner pedagogy and design architecture.

**Background:**

This paper reports a study of Centre for eBusiness and Communication, (Centre) and Information Technology, Systems and Multimedia Discipline (ITSM Discipline) students, academics (educators) and administration for several degree courses at Swinburne University of Technology, Swinburne Lilydale. The ethos of the Centre and the ITSM Discipline is one of engaging active learning through a constructivist paradigm. A combination of cognitive and behavioural strategies are applied, each of which is under continuing investigation and generalisation as descriptive strategies.
There seems, to date, to be only sporadic application of constructive strategies and no holistic educative approach for advising educators, who for the most part in Australia do not possess education profession training or qualifications. So educators simply mimic the parent, which for higher education educators is a traditional Lecture – Tutorial “teaching-as-telling” artefact.

While this is at this time a generalisation, the scene is very slowly changing through some educators who are aware of and espouse, a constructivist approach to higher education. However, few are able to implement a holistic constructivist culture due to knowledge and institutional constraints. At Swinburne Lilydale, both the undergraduate ITSM Discipline and postgraduate Centre learning and teaching environment are an exception, all be it still in its infancy with such an ‘enculturation’ model.

We use enculturation here as an active and holistic verb where a sustained cultural context is envisaged. We cannot at this point see a universal constructivist culture, however, we do:

- Provide and investigate examples (artefacts and people);
- Encourage and orchestrate student/student, educator/student, educator/educator interactions; and
- Directly research, encourage and teach the model espoused through action inquiry.

Tishman et al. (1992) spoke of enculturation this way when they suggested that teaching by enculturation is holistic in nature and that this model subsumes the traditional instruction models rather than replace them.

Enculturation at both the Centre and the ITSM Discipline, as a model, has developed from a goal of self-actualised learning as a social construction that has resulted from complex processes of reforming and improving the education activities of the Centre and the ITSM Discipline. This social
construction is measured through change, where changes come from the rhythmic effort of combining theory and practices involved, making the changes and reflecting on what has been learned. This is typical of an Action Research approach (cf. Stringer, 1999) used by education researchers undertaking community-based and/or systematic construction.

Self-actualised and Self-directed learning (SDL), (cf. Knowles, 1975; Houle, 1984; Hiemstra and Sisco, 1990) affords a number of connotations, from learners motivated in a prescribed and dependent study through to learners generating their study material and path of learning. The former suggests a strong use of dependent learning with the learner environment taking on a high degree of directed action. Whereas the latter is far more self-actualised learning where the learner constructs the topic, time, place and pace. Therefore, there is a discernable pluralism as:

- **Self-motivated self-directed learning** – where the learner takes an active part in a structured learning environment. An environment that encourages subjective interpretation of learning within a stimulus contextualisation. It is interesting to note that motivation was not a competency of the original SDL competency measurement instrument developed by Knowles (1975, p61).

- **Self-actualising self-directed learning** – where the learner creates a learning path in accordance with an individual action to create a context or influence an extant context (i.e. construction, Bruner, 1960, 1986, 1990).

In essence, the two are similar in that the learner is making an individual response to learning. However, there is one notable differentiation in that the sphere of individual contextualisation is objective for the one and subjective for the other. In a survey (using the self-directed learning instrument, http://www.distance.syr.edu/sdlskills.html) conducted of students in 1st, 2nd, and 3rd years of undergraduate study (Calway, 2002) students believe they were moderately self-motivated and moderately self-directed. While the
academic staff agreed with the students in terms of self-motivation they disagreed the self-direction, suggesting students were low and/or did not understand this aspect. Self-direction of a learner does not seem to be associated with the dependence or independence of the learner, rather we suggest it is associated with the needs (insecure through self-actualised) focus of the learner that need to be met, e.g. independent learners can have multiple levels of self-direction.

This paper describes an understanding of self-directed learning gained while researching to construct an active (participative) learning environment for undergraduate students of the ITSM Discipline and the Centre. The research was induced by two events; firstly, the technology used to distribute the computer-assisted learning to students became obsolete requiring a replacement in first semester 2002. Secondly, observations from prior studies (Calway, 1999, 2000, 2001,a, b) and academics that indicated undergraduate students were not self-actualised or self-directed learners on the whole, whereas postgraduate students fluctuated between a dependency and independence.

Also, the use of online (computer-assisted) flexible learning materials made no significant difference to student outcomes or motivation to learn when compared to other more traditional approaches taken by other disciplines in the same university campus. There existed sufficient anecdotal observations to suggest that, on the whole students possessed a prescriptive and deterministic nature that would be anticipated for a traditional dependent learning paradigm (cf. Grow, 1991/1996).

This has lead us to the view that what was being observed ran contra to the assumptions of constructivism in that self-actualised learners seem to be a product of a social construction. This dichotomy could loosely be viewed in terms of Maslow’s hierarchy of needs (e.g. Norwood, 1999) where the student is overtly progressed along a path of objective security to the point of subjective self-actualisation. That is, a traversing from a “not knowing what they don’t know” and insecure as learners to “knowing what they don’t know”
and able to engage self-actualised learning given appropriate conditions (the
debate of whether we are a product of a social construction is not attempted
here).

**Department Learning Technologies:**

Within Swinburne University of Technology, Lilydale, the Centre and ITSM
Discipline is responsible for constructing learning for a post-graduate Masters
degree and undergraduate students studying for Bachelor degrees in the
information technology, information systems and multimedia discipline areas
respectively. The premise that underpins the development of our learning
technology is that the learner is not sufficiently knowledgeable to be self-
actualising at point of entry to the program, i.e. they “don’t know what they
don’t know.” If we were to suggest a self-actualising subjective
contextualisation then the student would be sufficiently knowledgeable to
deduce that they “know what they don’t know” and are seeking a learning
environment sufficiently rich in which to subjectively construct meanings.

Having made this observation, a second emanates in that a Constructivist
learning approach assumes a student comes to learning as self-actualising (cf.
Bednar et. al., 1991; Wilson et. al., 1995; Wilson, 1997). If, as the ITSM
Discipline did, you take the constructivist learning framework, then you are
faced with the dichotomy of providing sufficient objectivity to direct students
to a path of learning on which they can individually and subjectively traverse
given the low or distracted motivation mentioned earlier. Data previously
reported (Calway, 2001b) suggests that students of the ITSM Discipline in fact
are prescriptive goal-oriented learners focused on “what must be done” rather
than the self-actualising attitude of “what is worth knowing.” Houles
suggested this observation in his original motivation points first discussed in
the early 1960’s.

For three years now Centre and ITSM Discipline students have been provided
with an expansive online and classroom-based learning environment. This was
the first generation of a learning model that has been developed, what we are
calling an active learning environment that reflects the diversity of learners’
self-awareness, offering objective and subjective capacity commensurate with capability. The active learning environment assumes that each student requires direction at some point, and that this direction is most likely to occur at the start of a student’s learning or at a point when students are distracted from learning.

**ITSM Learning Environment:**

The desire of the Centre and ITSM Discipline staff remains to create an online web-based and classroom environment that provides the initial objective structure suggested for focusing student learning and to promulgate a self-actualising culture within which students frame their individual learning as a participative model of active learning. Studies by Calway (1999, 2001b) indicate that while most students can and will study in online mode not all students engage with an online learning environment nor do all students engage with self-directed independent let alone self-actualised learning. This along with other scenarios provides a problematic learning environment development. At this point the opportunity exists to engage theories that deal holistically with problematic scenarios.

Systems Thinking (cf. e.g. Robotham, 2000; Tam, 2000) is one such theory that provides opportunity to think holistically about what is to happen in self-directed learning (SDL) and the active (participative) learning environment and to seek the structural elements that relate to it. Systems Thinking (cf. e.g. Checkland, 1981; Banathy, 1995) enables the developer/viewer to uncover assumptions that are positive and/or negative to the desired structure. Likely agents, whether students, academics, industry, or the like can be described along with likely or intended consequences of actions. There is the capacity to look at the environment from multiple viewpoints, from the micro to the macro, enabling the determination of opportunities and leveraging actions. As part of the analysis process the opportunity exists to identify and constrain variables, and to view both quantitatively and qualitatively test propositions and to view the systemic consequences that alter the original structure. Each step is played out over time and is therefore available to be observed and measured.
These comments have now framed the following descriptive analysis of our active (participative) learning environment. Prior to the discussion a pictorial representation is given in order to assist the reader deal with the inherent complexity of such a structure. The means of representation is via a Rich Picture (Figure Three) (cf. e.g. Checkland, 1981, 1988; Checkland and Haynes, 1994).

Points to notice within Figure Three are that there are structural elements that are determinant. For example, industry is requiring workers; workers who are discipline competent and who possess specific generic competencies and knowledge. Also, society has established norms and a social construction that in Australia sees many secondary qualified individuals entering universities. Students enter the university system with a desire to gain a degree qualification in order to graduate into society and industry and bring a diversity of knowledge, competencies and constraints. Students therefore enter a highly structured environment. The inherent structure has further been empowered through a university system that has rules and norms that emanate from centuries past. Amongst these norms are the learning structures categorised as ‘traditional’. However, the past several decades have seen individuals researching and implementing new structures and learning socialisations. This has led to strategies for instructional design (e.g. Romiszowski, 1977; Wilson, 1997; Tam, 2000) that redefine the focus of learning behaviour away from the academic/teacher as the knowledge repository to the student as a self-actualising knowledge creator.

**Active (participative) Learning Environment:**

If then, the academic accepts the self-directed, self-actualised paradigm and desires to implement it in practical terms, this alters the role of the student from being a passive participant in the learning experience suggesting this must change to that of an active participation. Rather than knowledge being pushed into a prescriptive form, it is a requirement that knowledge be remodelled into a form that is modular and problem or project-based, contextualised and framed by an industry and disciplinary priorities. A
conceptual and strategies model of the learning environment (discussed above) was developed by us to express the relationships, entities and attitudes necessary to define the cultural context and approach.

If we were to take the student as the conceptual customer entity and learning as the conceptual relationship, then ‘making sense’ of as knowledge must provide the objective entity in an active learning view of the world:

Teacher    Explicitly Structures – Discipline Knowledge
Teacher    Creates – Active Learning Environment
Student    Learns (makes sense of) – Knowledge from the Active Learning Environment
Student    Becomes independent and interacts with Teachers as a Collaborator

If the view were an instructional/traditional view, the relationship would probably have been:

Teacher – Structures – Discipline and Generic Knowledge
Teacher – Instructs – Student

This brief comparison is indicative of the changed relationships and therefore the change in strategies and applications/systems required for such an active learning environment, particularly one that is constituted using web-based technologies combined with traditional classroom applications/systems.

So, what does the new model look like and what strategies are employed to enculturate students, academics, industry and administrators as they enter the active learning environment?

Students/Teachers – choose – the discipline specific knowledge majors/minors.
Students and Teachers collaborate in the generation of knowledge.
A Course – is constructed with industry imperatives for discipline specific knowledge and core generic knowledge.

Teachers (Academics) – are discipline qualified.

Students – comprehend the need for discipline specific knowledge and core generic knowledge or

Students – don’t comprehend the need for discipline specific knowledge and core generic knowledge.

Teachers (Academics) – create – lessons and learning objects (structure discipline knowledge).

Lessons – are – problem or project-based.

Learning Objects – are – Content/concept focused (topics), etc.

While this is not a complete or comprehensive list of entities and relationships it is indicative of the relationships, attributes and strategies inherent in the desired collegiate learning environment. However, a point to note is that this does not capture the variety of behavioural and agency aspects acting upon that structure. Next the paper discusses the role of online learning and a descriptive case study of the enculturation model and strategies already activated at and/or envisioned for the Centre and ITSM Discipline. Also recorded are our observations and student anecdotes.

**Learning Environment Technologies:**

Probably since the development of the moveable type printing by Gutenberg in 1436 and therefore publication of ideas for communication and learning, there has been no other single technology since that time that would enable society to efficiently collect and distribute information and technology – that was until the Internet.

Books as a means of information communication and teaching aid suffered from the same problem we have today, that is few people who are appropriately literate. However, this was overcome in the last century and in large part the education system is a party to the spread of knowledge through the engaging of learners with reading. Today the issue is an illiteracy of a
different kind, that of Internet and information technology and self-directed learning illiteracy.

Also there have been many “doom-sayers” about the demise of teaching and learning, but equally there have been visionaries of what is possible when considering the confluence of technology and learning. If we take the artefact of a book we can see that it contains topical and delimited textuality that enables the individual to create individual journeys through the content even to the point of reading nothing more than the title.

We can see so many parallels between the first literacy technology and the most recent. You could no longer think in terms of scrolls rather you had to think pages. Innovations such as chapters, indexes, and libraries provided higher degrees of accessibility to materials contained between the covers. Equally we can see the changes in education through active learning, problem-based paradigms and various other participative approaches to learning.

If we skip forward to the late twentieth and now twenty first century organization we see attempts at codification of social norms and beliefs in the form of training manuals, standards manuals and educational programs. With most literature it did not matter much what the reader thought, however, with educational programs (particularly postgraduate) it is important to organizations to not only transmit fact, or expert knowledge, but also tacit knowledge such as heuristics and beliefs or studies etc.

With the advent of the Internet and the Intranet, universities, organizations and individuals have an unprecedented access to information as expert knowledge facts and norms, and also tacit knowledge through email, multimedia, conferencing and the like. How then are learning and knowledge enacted organisationally and systematically “corporately and institutionally”? As with the publishing and subsequent education systems and theories, we can once more break the old learning artefact.
If we look at post secondary education we have technical institutes where there is an emphasis on competency based knowledge and learning. Universities add to this knowledge creation – although they have come under attack with the advent of vocationally focused mass higher education undergraduate degree programs. Corporations equally in large part have concentrated learning and knowledge to the “what” and “how” of the organization. Certain levels of higher education study and certain sections of organizations may well concentrate on knowledge but for the greater part of learning and knowledge we are entrenched in the 19th and 20th Century systems mindset or norms and behaviour. Like Sigfried in “Get Smart”, “this is CAOS we don’t ‘shush’ here”.

We would suggest that this scenario is so prominent that the traditional models of learning are failing us and that new models are required in order to make sense of the challenges of acquiring expert knowledge and skill. Even greater though is the retention of tacit knowledge (data warehousing, etc.) and intra organizational deployment.

In titling this presentation “eLearning – a roadmap” we purposely have chosen the metaphor as a means of showing what can be either a very helpful or very frustrating technology. However, we wish to add to this heading “for shared journeys”, for while a roadmap may initially prove frustrating it is equally information laden and open to structuring all sorts of innovative actions on the part of the journeyers. We must emphasise that we are seeing eLearning as both an individual constructive learning and knowledge creation perspective and shared, with instructive learning and knowledge acquisition as encapsulated entities within this model.

Now with the eLearning environment as a shared constructive scenario we wish to adjoin a participative and active learning paradigm. Within eLearning – we like to think of the “e” as expressing much more than electronic. What about exciting, emancipator, experiential, engaging, entrepreneurial, etc. We are going to take it for granted that we are thinking alike in that we see an
entirely new technology for knowledge communication and creation and an entirely new way of approaching instruction and learning.

Case Narrative: (prepared by Assoc. Prof Paterson)

The details below are a narrative of the analysis of the Centre’s learning environment as currently enacted:

*Shared learning journey*

I as a student enter the journey – enrol in a subject;

Look around – receive learning materials and entry to web site – see what is around;

Rich resources alongside this road – sense of being able to access what will be needed;

Meet a person – the teacher/academic, who talks about “you the learner” and the outcome of the journey “your learning” and the assessments “evidence of your learning”;

Sense of possibilities as we commence the journey – openness, self-direction, benefit to me;

Guide available – Ok to ask questions, assistance, provocation by being asked questions, questions that stay with you until answered, questions that stretch and challenge;

Journey has a difference – realisation that I will learn and start to get ideas of what I could achieve from the learning experience;

Travelling together – teacher becomes guide, and talk is of shared journey, meet other travellers learning, learn from each other, blur of roles, everyone
learning, many guides, Ok to say “how it is” for me, OK to ask any question, OK if any member of the group answers the question, questions lead to amazing places and shifts in thinking;

Experiences of travel – enjoy the rich information/knowledge base, reach into it as need arises or questions to be answered demand;

Uniqueness of my journey – negotiate to deviate, negotiate to focus intensely, negotiate for shift in pattern of study, work-based projects, realisation of taking responsibility;

Difficulties – guide notices I am stuck and makes connections to assistance (resources, other students, or questions to draw my attention to useful options), personalised attention to get me back on track and making progress, miraculous change in me that inspires my engagement;

Understanding of self – celebration of differences and richness of intercultural learning;

Recognised for achievements – by other students, by employer for work-based assignments, by guide, by myself through learning reflections required;

What next? – suggested learning activities to prompt action, progress and options, encouraging me to answer my own questions;

Notice not everyone engages fully – realising they miss out on the intangibles that are becoming tangible benefits, able to be articulated;

Awareness of learning by experiencing, observing and self- direction – discussions of tacit learning , learning from example, being lead encouraged and provoked;
Always more adventures ahead – sense of possibility, opportunity, higher learning, significant raising of my expectations for my performance, increased readiness in me, shared celebrations of each travellers progress;

Journey direction and nature of activities – always evolving, re-organising;

Realisation – I have been learning, I have become more capable, a more mature learner, I can direct my learning, there are so many journeys and each so rich, I have done and achieved amazing things, I can debate, I can explore and find my own path; and

What now? – I want to go on, I have so many ideas of what I want to learn, I don’t want to journey alone all the time, I want to share parts of my journey with others.

**Enculturation**

Everyone in the Centre knows the vision, the education philosophy and what it means on a day-to-day basis;

Consistency in approach, with significant differences in style and detailed processes;

Academic staff and administrative staff. Significant shared knowledge and exchange of roles when necessary;

Creation of opportunities to know each other as individuals;

Orientation involving new students, previous students, administrative staff, academic staff, sessional staff, support staff (language, math, counselling, student union);

Informal style within a framework – many opportunities to chat with individuals and get a sense of being part of the place and sharing; and
Discussion quite directly of approach, espousing active learning, taking responsibility for self, making meaning for your self, changing way of thinking, doing things differently, using the concept of a self-reliant manager to focus on improving self in a holistic way.

**Community-Based Social construction**

Collegial, supportive, accessible, open office, shared facilities, observe academic debate amongst staff and other students, sensitive, caring, wider concern, awareness of changes in people, asking and answering questions;

Opportunities to meet with staff individually or communication electronically;

Consistency and difference. Staff taking the approach in their own way, so students experience significant variations but same underlying approach;

Use of approach needed by the students at the time, subsuming instructivist and any other approach relevant at the time, but always returning to self-actualisation;

Opportunity to work within this workplace culture and experience its affect;

Shared celebrations of achievements, however large or small, simply and frequently;
Recognition given and appreciation expressed;

Meeting each other where we are at – with daily variations – leading to where we need to be;

**Text Narrative: (prepared by Dr. B.A. Calway)**

Constant awareness, maintenance and adjustment of the work space to ensure the culture is living and sustained;
Everyone has an understanding and everyone contributes;

Complex improvement processes; and

Observation, curiosity, asking “how is it”, “how did it become”, “what is needed”, “what if”, “how could it be possible” “how could we make it happen” etc.

**Summary Narrative: (prepared by Dr. B.A. Calway)**

*eLearning*

New ways of making it possible, new ways to enable it to happen, easy to say not so easy to do, having an experience of it working helps to understand the essence that must be facilitated with technology, passion to make it happen, willingness to share the journey (guide’s journey) with the students – providing the resources necessary are made available (information and specialists and IT applications).

Without exception students entering Swinburne University of Technology, Lilydale, undergraduate and post-graduate courses state “what do I have to do to pass”. This is in spite of individual self-motivation, learning styles, knowledge and skills, or independence in learning. We have seen that students entering our courses are entering a city and a journey over which they may initially have little control, very much a “means to an end” scenario, however, in a very short time they are participating in a constructive engagement with learning and their fellow journeyers.

Educators hear the terms “customer focused” and “learner-centred” and agree with the sentiment while sparing little thought as to the empowering relationships of the ‘I’ academic/teacher have or can have when sharing something with ‘you’ the student, and more importantly the inverse relationship that engages learning for both parties. Therefore we have explored in the narrative what a participative and shared learning journey can look like regardless of the city (objective) that the student and
academic/teacher enters. In other words we are socialising both students and staff in a participative, self-actualising learning journey.

We opened discussion with - “Challenging passive students to be active learners and to practice academic skills does change the rules of the classroom and teaching expectations with which students are most familiar.” (Meyers & Jones, 1993:12) A decade later and not much seems to have changed in the wider world of learning and teaching. The language is still the same, i.e. challenging passive students. Who is doing the challenging, the students, the academics/teachers, neither or both? The focus for us is on learning and that ALL parties agree too, and shared the journey. That is, we not only have active students but also active staff, both as participative learners, both contributing to and sharing the resources available and finally, both having individual and shared outcomes.

What has been described above, as the active (participative) learning environment for 2002, is a continuing research project to develop a human activity system in the holistic sense of the term. Implicit with the environment is the necessity to provide a stepping out point for students regardless of their study motivation or extent of explicit discipline knowledge. The key issue is that the processes of individual knowledge construction are processes that involve both cognition, affective and real or vicarious actions. The role of the academic, as an example, changes to one of making explicit tacit discipline and generic competencies and knowledge and then acting as a collaborator.

Equally the role of a student changes to one of conversion of what would seem to them tacit knowledge (even though the academic may have structured it in a learning environment) into individual explicit knowledge a process of ‘making sense’ of unstructured ‘messes’ that reside in one’s mind as assumptions, feelings, ideas, biases, heuristics, memories, etc., as Malhotra (1998) suggests. With the active learning environment the student is provided a view of knowledge and a context within which to make explicit their tacit learning. However, we must remember students will be individually
constrained by their extant knowledge and competencies, their physiological and sociological determinants.

Ultimately the self-actualising student, who has engaged with learning through their learning style, will make sense of their individual knowledge within an intrinsic micro and extrinsic macro construction. Continuing research and development includes how to recognise what the term ‘making sense’ means to students with different learning styles.

All references for this paper are presented at the end of this folio.

3.10 Summary Thoughts

In many respects, the very axioms of Swinburne Lilydale - learner-centred, liberal, flexible and multi-modal, and multi-disciplinary, have fallen prey to the pragmatic demands of students, and their desire for metered content and prescriptive assessment targets. Questions that helped focus the study, reported in this folio, include:

- what needs to change in the ITSM Discipline learning environment in order to have active, self-actualised learning by the students?
- can online computer-mediated learning provide a “significant (non-detrimental) difference” for students choosing this mode of study?
- what agency is operating to influence the students’ choices?
- can online computer-mediated learning be developed to a stage where students choose self-actualised learning over their current enculturation and/or conventional transmission instruction?
- what skills do students currently have or need for them to engage in self-actualised learning?

The flexibility offered to academics and the students via online and computer-mediated learning materials was made obvious by the immediate and positive
response. During the past five years performance reviews and research have been conducted in order to test the efficacy of the ITSM Discipline learning environment as it progressed toward a virtual/online and active learning pedagogy.

The ITSM Discipline learning environment has as a theoretical foundation, three understandings interacting as a tripartite relationship:

- Active and Constructive learning approach (Meyers & Jones, 1993; Wilson, 1997; Wilson et al, 1995; Abbott and Ryan, 1999)

This position enabled me to view the learner and the learning from a dual hermeneutic of learner as an agent and learning as a structure. These are not dichotomous, rather they offer a self-supporting holism where the individual’s learning is reflexive and adaptive within any given interpretation of the learning structure. Why this is important to the study can be seen in this chapter where it is shown that the extant learning model currently espoused may leave the learner as self-motivated, however, lacking the learning skills or approaches needed to realise the a self-actualising learning outcome.

Comments received on student surveys describing the pedagogy as “lazy”, and “lacking in direction” are scattered throughout the evaluations conducted by the ITSM Discipline staff. It may well be the fact that the learning approach, as currently prescribed by Swinburne Lilydale, has created a scenario where students believe that all that needs to be known in order to pass a subject’s assessment can be found in the learning guide, and that any extra reading collaboration, reflective practice and self-assessment is above and beyond what is already provided (or required). While some students appear motivated to undertake the work, a significant majority seem
unmotivated toward exploring the learning potential that is offered within the flexibility of the approach of the ITSM Discipline.

The current study, as with many other research projects around the world, aims to re-conceptualise the entire learner and instructional design scenario, moving the learner from a “teaching as telling”, surface study approach “tell me what I have to do” toward a “help me understand” deep study learning facilitation. In simple terms this is a move from minimalist to active pedagogy. I argue that there are two levels of learning, i.e. Competency and Conceptual (i.e. skills and knowledge, ‘know how’ and ‘know what’), Contextual and critical (i.e. understanding, critical thinking and abstraction, and ‘know why’) but that neither of these operates outside of the pedagogical enculturation of the student. Expressing learning as behavioural and cognitive aspects of a lesson and learning objects enables the instruction designer considerable latitude to incorporate learning theories and instructional design theories with instructional technologies. In summary, the ITSM Discipline learning environment as a conceptual model acknowledges the following:

- learning is a duality of learner activity and learning structure represented in knowledge objects (Lesson/Learning Objects);
- learning objectives need support in both topical “what is worth knowing” and a temporal acquisition of such knowledge;
- learning is a human activity and as such can be expressed using systems models;
- learning outcomes framed as knowledge objects must express Competencies and Concepts where these are seen to be mutually supportive;
- learning as Contextual abstraction and Critique can be expressed as Lessons, flexible, multi-disciplinary and active in nature; and
- learning can be computer-mediated without loss of outcomes.

Clear expression of learning outcomes along with learning objectives expressed as pre-test statements as interrogatives (using graphical, audio and textual means) and reflective journals will aid in the learner seeking further information. Consideration
should be given to the use of computer-mediated pre and post-testing of knowledge, not as assessment for credit, but as a reflective approach for self-actualised learning.

The study reported in this chapter, for the period 1997/8 to 2003 provides a descriptive meta narrative against which to evaluate any future remedial and therapeutic actions emanating from further research. In conducting and constructing the ITSM Discipline learning environment I remain aware of the extent to which the computer-assisted learning phenomenon is moving the learner closer to the precipice of ‘pragmatic learning’. This precipice is seen as a danger not to be ignored. Chapter Four now takes the study and thoughts so far developed and suggested a Dissertation that investigates student learning skills and approaches recorded in Semester One and Two 2002.
Chapter Four
Dissertation - Student Learning Approaches Analysis

4.0  Introduction

In accordance with the broad goals of this folio, namely to record, in a systematic way, knowledge and experiences gathered during the implementation of the ITSM Discipline learning environment, Chapter Three was a descriptive meta narrative reporting of the learning environment evolution. My intention is to capture the richness of narrative through an integrated folio of analysis that could form insights for related research or grounding for future quantitative and qualitative studies.

The Dissertation presented in this folio studies student learning skill perceptions and learning approaches resulted from the inclusion of a ‘reflective journal’ process, in accordance with the Meyers and Jones (1993) proposal, for all ITSM Discipline subjects virtual learning guide web-sites in 2002 for Semesters one and two. Students completed these as part of their assessable work and the student responses were captured at the start of each semester.

In this chapter I present the methodology, data collection construction and the data analysis approaches for the Dissertation part of the folio. Included are discussions of the nature and limitations of the data collection, its reliability and veracity given the novel and unrepeatable nature of the study.

4.1  Part II - Data Collection and Analysis Methodology

There is one key resource for this part of the study; student journals captured as a learning skills inventory and learning approaches descriptions. These student journals were made available as a desensitised data collection in early 2003. I saw an opportunity for secondary analysis of the data specifically related to learning approaches of ITSM Discipline students. I considered that the study of such a resource could inform the further development of the ITSM Discipline learning
environment and the development of future curriculum and instructional design for the ITSM Discipline subjects at both undergraduate and postgraduate levels.

The data are a collection from questionnaires and were captured using the WebCT system, as part of the online reflective journals process in the first week of study for students of the ITSM Discipline, semesters one and two of 2002. The primary or initial use for the questionnaires was for ITSM Discipline staff in each subject to understand something of the learning skills and approaches of their students. Also, the questionnaires were the first of 10 journal entries during a semester aimed to have students review their learning approach, knowledge acquisition and world-views. The data file provided for the present study was provided as a desensitised Excel spreadsheet. Figure 4.1 (below) represents a sample web-site page of a completed learning skills questionnaire.

The questionnaire detail used in the study was adapted from Knowles (1975) ten question learning skills inventory analysis. This self-reporting questionnaire was administered online to students enrolled in ITSM Discipline subjects. The questionnaire has not been used by any other discipline at Swinburne Lilydale, or since 2002 in the ITSM Discipline due to the workload perception of ITSM Discipline staff discussed in the interviews with staff (reported in Chapter Three of this folio).

Students were given access to the online journal submission during the beginning (week one) of semesters one and two in 2002. The students were able to gain access through their respective ITSM Discipline subject web-sites. Students were required to submit reflective journals on a weekly basis and the learning skills inventory was administered as an attachment for the first week’s journal only.
Week One Students Journal – Self-Directed Learning Skills Inventory
(adapted from www-distance.syr.edu/adlskills.html)

The following are skill areas that learners can examine to determine how well they fit as a personal attribute. Knowing such information will help you identify those areas of strength that can be used in future self-study efforts and those that may need to be enhanced in various ways.

For each potential content area, check the most relevant column indicating a "self-assessment." To assist in the decision regarding which column to check for each area, use the information below. Make your best estimation how well you are able to use or carry out the designated skill.

- **DK** If you believe you currently do not have or are not able to use the skill listed. This may mean that you will need or will want to develop the skill through future discussion, reading, practice, etc.
- **LO** If you currently have a low ability to use the listed skill, but could raise that ability to a desired level through specific learning experiences.
- **MD** If you currently have a medium ability to use the listed skills some specific learning experiences or activities would develop your abilities more.
- **HI** If your past experiences and activities have substantially developed the listed skill area.


**SELF-RATING ON SELF-DIRECTED LEARNING SKILLS**
(Self-rate your skill by checking the appropriate column box)

If you have completed this inventory in another subject - place that subject code in Skill area 11 below only

<table>
<thead>
<tr>
<th>Skill Area</th>
<th>DK</th>
<th>LO</th>
<th>MD</th>
<th>HI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to question, inquire, and problem solve.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
</tr>
<tr>
<td>2. Ability to keep an open mind to other points of view.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
<td>.</td>
</tr>
<tr>
<td>3. Ability to scan data and quickly choose relevant resources.</td>
<td>.</td>
<td>Y</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>4. Ability to collect data on performance through self observation and feedback from others.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
<td>.</td>
</tr>
<tr>
<td>5. Ability to assess your present performance using that data.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
<td>.</td>
</tr>
<tr>
<td>6. Ability to translate learning needs into learning goals, plans, and activities</td>
<td>.</td>
<td>.</td>
<td>Y</td>
<td>.</td>
</tr>
<tr>
<td>7. Ability to set goals to improve present performance.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
<td>.</td>
</tr>
<tr>
<td>8. Ability to observe and model others' performance to improve.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
<td>.</td>
</tr>
<tr>
<td>9. Ability to make a firm commitment to working on goals.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
</tr>
<tr>
<td>10. Ability to maintain continuous self-motivation.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>Y</td>
</tr>
<tr>
<td>11. Describe in 50-100 words your self-directed learning approach.</td>
<td>I currently have a system where I put aside specific time to study. This sets up the environment where I can examine the goals I need to achieve. By reflecting on feedback from tutorials, assignments the gaps in my knowledge becomes evident. This was quite successful last year. I achieved beyond my expectations in that, my first year back at study after 20 years.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.1  Student Questionnaire – Self-Directed Learning Skills Inventory
A limitation of the data analysis is verification of the questionnaires responses with any of the students who completed the learning skills inventory, having no identifying element other than the subject code and subject level. Focus groups were considered as verification; however, many of the students had graduated and no longer available to participate as the data did not become available until mid 2003. Augmenting the questionnaire data is a record of analysis of summarised examination results for the period 2000 to 2002 inclusive of ITSM Discipline subjects.

4.1.1 Questionnaire Codification
The students were instructed to rate their learning skill areas, using the following scale, in order to determine what level they had attained in their current learning process:

- If the student indicated a ‘DK’ level of understanding for a particular skill area, then this response was recorded in an Excel Spreadsheet as a ‘1’ for statistical analysis.
- If the students believed that they had an ‘LO’ level in that skill area. This response was then recorded as a ‘2’ for statistical analysis.
- If the student indicated ‘MD’ this level of ability for a skill area, then this was recorded as a ‘3’ for statistical analysis.
- Lastly, if the student’s rated themselves as a ‘HI’ in the specific learning area this was then recorded as a ‘4’ for statistical analysis.

Skill area eleven (Figure 4.1) of the learning skills inventory questionnaire was my addition to the Knowles questionnaire and required students to vocalise their learning approach as a descriptive narrative answer of up to one hundred words. I considered the inventory to be incomplete if all that was considered was the skills without some attempt to understand process and motivation, attributes that could be found in a rich narrative of skill area eleven. Each narrative was the expression by the students of their perceptions of their learning approach. Because the vast majority of the students
completing the questionnaire answered this element it became possible to consider analysis of the narratives for trends and/or commonality.

My analysis of the data set required codification of the narratives, a task undertaken using design space and content analysis methods. Content classification can take a number of forms including the use of terms, counting instances of words and terms, looking at physiological production of narratives, particularly orally produced texts, etc. In order to undertake a content analysis of the eleven learning skills elements two steps are involved. A transcript is developed for each student based upon the questionnaire recorded within the ITSM Discipline learning management system and captured as a record in a spreadsheet. With a transcript in hand Wilson (1995b, pp. 259-273) suggests that the first step in dealing with the transcript as qualitative data is to set up some type of classification schema, in my case this is Design Space Analysis established by MacLean et al. (1991).

Design space analysis (MacLean et al. 1991) is the approach I have chosen for classification and interpretation of the learning skills inventory content analysis data collection, the learning approaches identified, and the operational schema heuristics. The latter two (i.e. learning approaches and operational schema heuristics) will be used to induce a classification schema, and the student narratives as transcripts will be used as input to the classification schema. The notation used for the classification schema is QOC analysis (MacLean et al. 1991, pp. 201-250), which can represent the design space around an artefact. The “Questions” identify the key design issues or, in our case, the learning approach issues. “Options” are representative of answers to the Questions, and “Criteria” are used to selectively identify the acceptance or differentiation constraints for Options related to any single Question. The artefact in the research is an amalgam of student learning strategies and heuristics from descriptive narrative captured as skill area eleven in the learning skills inventory.

The codification of transcripts required that someone be charged with the task of viewing the narratives in relation to the classification schema proforma and deciding the codification. Such a task is subjective and results in some variability in the codification judgements of an individual and the potential for bias particularly on the part of the researcher. To minimise both these elements a double-blind approach was
used. In this research project two Honours graduates taking the role as classification raters, independently used the initial classification schema, however, if the individual raters viewed a need for clarifying Criteria or further Options they could add or adjust the classification schema dependent upon what they were observing in the student narratives.

The skill area eleven QOC classification schema was developed initially by taking one set of student responses for a single subject. These responses were initially analysed by me for areas of commonality. Several key concepts were revealed by this approach which formed the basis for the initial QOC options and criteria. This QOC analysis was then used and elaborated by the classification raters. Generally, multiple options for any question are observed as heuristics used by the students. Therefore, to achieve each classification schema these broader heuristics are used as criteria within the options derived by the researcher and raters.

Separately the two raters carried out classification, content analysis resulting in a classification schema codification and statistical analysis of the data collection, independently rated in order that the inter-rater reliability of data coded could be maintained. Then through a number of discussions between the raters, a satisfactory classification conclusion was reached in order to ensure that the initial codification was consistent and reflected a true measure of the overall data collection. The content analysis results were obtained by performing frequencies, percentages and then bar charts, to facilitate the most efficient and accurate interpretation of the results. The two raters who coded the learning skills inventory questionnaire responses and who performed the analysis both hold Bachelor of Social Science (Honours) completed at Swinburne University of Technology and the third as verifier was myself as researcher, however I could only review their choices without suggesting changes.

The formative classifications were incorporated within the final classification schema (refer to later in this chapter). It became evident to the raters as the codification progressed that further categories were essential for a significant number of the student transcripts. Inter-rater reliability and the recoding or reclassification then becomes an issue. Each rater worked independently for the first codification round.
They made their own judgements and codifications. It was only after the first coding pass that the codified data were reviewed by the two raters for commonality and recoding of differences (agreed by the raters).

The classifications agreed are as follows (examples of transcripts are contained for reference, in italics).

- A student narrative was initially categorised as a **Utilitarian** learner if they generally focused on ‘getting the job done’ and prioritised areas such as transmission of knowledge, assessment, grades, exams and were therefore pragmatic and outcome focused. Their course work was completed as required and generally involved good time management, planning and preparation as well as goal setting. Once a student’s response established them as a Utilitarian learner the number ‘1’ was then recorded to categorise this response. An example of one such response was:

> “I am currently developing for myself a study timetable using MS Outlook. Upon completion, this timetable will specify the various tasks, readings, practice work, assignments that I will be working on a specified time in line with the subject outline. As well as a detailed timetable, I will have a summary of dates that I wish to complete various parts of this subject. I need to timetable extra time to work on the skills that I feel I need to improvement such as item 3 above (of elements 1-10) and attend workshops in this area.”

- **Constructive**, generative learners are those who develop their own understanding of material as well as having reflective problem solving skills. They are able to reflect on mental models and adjust these models accordingly in order to assimilate new information. That is, any ‘new’ information that is gained is reflected upon, until the person’s earlier knowledge and understanding is able to
accommodate it. Once a student’s response established them as a Constructive learner the number ‘2’ was then recorded to categorise this response. For example, the following response indicates such a learner.

“My self-directed learning approach is to try and put all the theories in an everyday situation to try and understand the problem a little better then work on it from there. If I can’t understand the problem I try and find other situations and relate them together. I really need to improve on my learning approaches as they work but not as well as they should”.

- Students who were categorised as Disorganised learners, tended to be undisciplined, sporadic and unorganised in their learning approach. They showed evidence of bewilderment and were generally confused, not only about what work was required, but were also lacking knowledge of due dates. Once a student’s response established them as a Disorganised learner the number ‘3’ was recorded to categorise this response. An example is of a disorganised approach is as follows.

“Well, I learn as I go, sometimes I feel that we learn what we already know, therefore we slack off, then it begins to get in-depth and I realise that even going over what we know has an advantage, so I believe that my self-directed learning approach is adequate, but needs improvement”

- An Indolent learner is one who displayed complete avoidance in their approach. They spend large periods of time procrastinating and are totally unmotivated. They display a complete disregard for the importance and value of education and their learning process. Once a student’s response established them as an indolent learner
the number ‘4’ was then recorded to categorise this response. For example;

“My current self-directed learning approach needs a fair amount of work. I seem to have an uncanny ability to set viable, achievable goals and realistic timetables, and then ignore them completely. As a result, most of my independent study and assignment work is completed at the last minute. This is the main feature of my self-directed learning that I hope to eradicate.”

Due to a number of respondents indicating learning approaches that contained a combination of characteristics that were specific to both Utilitarian and Indolent learning approaches, another category was established to incorporate these responses as an independent category. This category contained students who displayed difficulties in maintaining their motivation. They primarily displayed varying levels of motivation, which fluctuated, depending on their interest in the topic being studied. However, once they became motivated about the topic, they then performed well and completed their requirements by the due date and generally obtained good results. They also tended to specify that they worked well under pressure. Once a student’s response established them as such a learner the number ‘5’ was then recorded to categorise this response. A respondent that classified as having difficulty maintaining their motivation was as follows;

“The aim of my current self-learning is to try and get motivated and remain motivated. I find that this is one of the areas I find difficulty. If I lose interest in the subject I find it difficult to keep motivated. I am good at querying anything that I do not understand, and am trying to teach myself to set goals and stick to them. All in all, I learn easily, and can adapt to most situations and find that
my current range of skills are great however could always be improved in differing ways.”

• If the response that the student gave was completely unrelated to any learning approach then a ‘6’ was recorded. No identifiable learning approach is;

“I apologise, but I do not understand the question. Having never discussed this area in class, it is hard to appreciate the exact requirement for this question.”

• If the student did not respond in any manner to skill area eleven then a ‘7’ was recorded as the missing value.

After further investigation, the characteristics specific to the Utilitarian approach displayed evidence of a sub-category. This sub-category showed that whilst students may be Utilitarian, they also demonstrate minimalist characteristics towards learning. So, while initially the Utilitarian approach was made up of the previously mentioned characteristics as a whole, some of these features are specific to a minimalist approach and as such, this sub-category was developed.

• A respondent was characterised as minimalist if their primary focus was on getting the job done and doing what was required, that is, completing set work such as assessments and exams, without any further effort. Once a student’s response established them as such a learner, the number ‘8’ was then recorded to categorise this response. An example of such a response is:

“Do what needs to be done.”
Subsequent to these analyses I considered the possibility of some interrelationships that existed between what was observable from the analysis of skill areas one to ten with that of skill area eleven.

### 4.1.2 Examination Results Analysis

There were a number of students who were presenting in more than one subject and as such were not required to complete the questionnaire multiple times. Generally this was less than 5% of the student population and therefore not considered to influence the analysis approach with significant distortions given the numbers of students and that causality is not being sought. Also no effort could be made to investigate the results from the student’s questionnaires in relation to multiple subjects because the data had been desensitized leaving no connection that was reliable.

Of equal importance was the consideration of whether some significant change had occurred in examination raw scores during the study period that could only be explained by the changes in the learning environment. The method adopted was to use examination of results data obtained from Student Administration at Swinburne Lilydale for subjects in which assessment included examination, for the years 2000, 2001 and 2002. For each subject, in each iteration, the individual student exam results, entered into SPSS, have the mean examination result calculated. The mean result indicates the average result out of a possible 50. Where the exam was scored out of a mark of less than or greater than 50 marks, the individual student results are scaled to be out of 50 to ensure comparability across iterations of a subject. Mean results are compared across the iterations of a subject to determine whether or not there was any significant difference between the mean examination results in Semester 1 2002, and those from previous subject iterations. The years 2000, 2001 and 2002 were important because they reveal results for students studying the 2nd and 3rd years of their degree programs. If only the results for 2002 were taken then no variances in learning outcomes could be detected in relation to the implementation of the ITSM Discipline learning environment in the year 2000.
4.1.3 Ethics and Politic for the Research

The overall research project was framed supported by theories that account for the human aspects of the project. As developer and researcher, I sought change management and ontological theory/s that would be inclusive of all stakeholders and, as human participants were involved, provide a framework for ethical, technological and experimentation implementations and subsequent data collection and analysis.

My starting point is theories that account for the human aspects. There are a number of ethics and emancipatory theories; principally, the theories express two broad categories: teleological (i.e. end or goal based) and deontological (i.e. obligation based), c/f. Ewing, 1965; Gundry, 1982; Spinello, 1997; Wood-Harper, et al., 1999. For the ITSM learning environment development project I take the theories that pertain to a deontological approach i.e. where the researcher or individual is obliged to account for their actions relative to other stakeholders.

Aristotle (in Thomson, 1995) is cited as saying that ethics is a ‘practical’ endeavour, which gives us practical knowledge. Finnis (1983) suggests that he (Aristotle) meant that one does ethics properly, adequately, reasonably, if and only if one is questioning and reflecting in order to be able to act, i.e. in order to conduct one’s life rightly, reasonably, in the fullest sense well. Therefore doing ethics is reliant upon a seeking of knowledge not only for its own sake but also as a basis of options for actions. These words act as a deontological approach, which places the obligation upon the individual without regard for cultural morays or laws, and which considers all aspects from an obligatory perspective.

Mumford’s approaches (1993) could also be said to have a deontological emphasis of obligation on the part of the developer/researcher. In short, Mumford suggests that anyone affected by a change should be involved in the process of change, this being supported by emancipatory theories (c/f Gundry, 1982; Mumford, 1993). For the data collection, in this dissertation, regard was given to assuring anonymity based on desensitisation of data prior to its inclusion in the research.
4.2 Learning Skills Inventory Analysis

The prior sections presented the research design specific to the Dissertation. The chapter now takes the learning skills inventory data collection and provides an analysis of these data as a Dissertation.

After five years of the ITSM Discipline learning environment development, there was one active learning process that had not previously been included, that being reflective study journals. The journals, which normally form part of an active learning pedagogy (Meyers & Jones 1993), were intended to provide an electronic record of topics studied and problems encountered by students for review by ITSM Discipline staff and the students themselves. Students on a weekly basis completed the journals with a small assessment value as a reward for completing ten weeks of journals. Each semester had twelve weeks and there were two semesters in the year 2002 that were recorded.

4.2.1 Learning Skills Inventory - Areas 1 to 10 Analysis

Learning Skills inventory skill areas (1 to 10) were codified against each student and the analysis has been dissected along subject and year level lines, which means there are three levels in total. It must be noted that, while students are expected to complete their degree studies sequentially from undergraduate level one subjects through to level three subjects, it is possible for a few third year students to be completing a level one subject as an elective and that combinations of levels (particularly levels two and three) are possible as students studying full time are required to attempt four subjects per semester. As mentioned earlier in Chapter Four the students studying more than one ITSM Discipline subject in a semester were instructed - “If you have completed skills inventory in another subject – place that subject code in skill area 11 below only.”

The most striking points to observe in the preliminary analysis of the data is the commonality between subjects presented at all three year levels relative to the skill level skill level percentages for student responses, here recorded as positive and negative skew. Due to volume of the data collection these analyses are contained as
Appendix 3.1 and 3.2. A positive (+ve) skew (Table 4.1 below) is taken to be where there are fewer ‘LO’ responses in relation to ‘HI’ responses within the same subject/semester. A negative (-ve) skew (Table 4.1) is taken to be where there are more ‘LO’ responses relative to ‘HI’ responses. The codification for calculation purposes was 1 = ‘DK’, 2 = ‘LO’, 3 = ‘MD’, and 4 = ‘HO’. Appendix 3.1 Figures represent skills areas one to ten of learning skills inventory for semester one 2002. Appendix Figures represent skills areas one to ten of learning skills inventory for semester two 2002 contained as Appendix 3.2. These data are held in appendices in order to facilitate a clearer viewing of the data.

<table>
<thead>
<tr>
<th>Skill Area Skew</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distinct +ve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate +ve</td>
<td>△</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>△</td>
</tr>
<tr>
<td>Neither +/−ve</td>
<td></td>
<td></td>
<td></td>
<td>△</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate −ve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>△</td>
<td></td>
<td></td>
<td></td>
<td>△</td>
</tr>
<tr>
<td>Distinctly −ve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
</tr>
</tbody>
</table>

Table 4.1 Skill areas 1 to 10 Relative ‘LO’ to ‘HI’ Skew, all Subjects for S1-semester one (brick pattern, n=919) and S2-semester two (solid colour, n=792).

Table (4.1) is therefore a graphical summary of the Semester One and Two skew analyses that records students’ perceptions. Students’ ‘ability to question, inquire and problem solve’ (skill area 1) and ‘ability to keep an open mind to others points of view’ (skill area 2) both semester one and two are reflecting a similar response pattern. Students see themselves positively in both these areas.

Students’ perceptions of their ‘ability to collect data on performance through self-observation and feedback from others’ (skill area 4) is moderately negative suggesting students lack confidence in this area and would benefit from training in
these aspects of their learning. These results would suggest that students are more reliant on being told what to do and when, and are less skilled in assessing change within their learning approaches.

Students’ perceptions in all other learning skills positively changed between semester one, at the start of the study year, and semester two (approximately 6 months later). There is not sufficient data to explain this trend at this time, requiring a further longitudinal study that could isolate the variable/s and causality of this change.

**Finding 1** The overall negativity of responses to skill area three through ten would lead students to be more dependent upon teachers, require more prescriptive learning materials and assessment outcomes.

**Finding 2** There is little evidence of improvement in learning skills of students at the various levels during their study.

Therefore a course that incorporates learning skills development combined with information literacy could be important and when combined with students present positive problem-solving learning skills and an understanding of individual learning styles could prove a valuable turning point for student learning-centeredness.

The students’ self-motivation (skill area 10) is moderately to distinctly negative compared with their perceptions of their other learning skills. Therefore in a further analysis of the data a relative calculation was made using a grade point average (gpa) method as a means of highlighting perceived strengths and weaknesses recorded as Figure 4.3.1 and 4.3.2. For the calculation of the gpa ‘DK’ was assigned 0, ‘LO’ = 1, ‘MD’ = 2, and ‘HO’ = 3. The number of responses for each was multiplied by the assigned number, summed and averaged to give a figure between 1 and 3.

In semester one, (Figure 4.3.1) student perceptions were **most positive** for skill areas one and two and **most negative** for skill area five then followed by six, three and ten:

- **Skill Area 1**  Ability to question, inquire and problem solve;
- **Skill Area 2**  Ability to keep an open mind to other points of view;
Skill Area 3  Ability to scan data and quickly choose relevant resources;
Skill Area 5  Ability to assess your present performance using that data;
Skill Area 6  Ability to translate learning needs into learning goals, plans and activities.
Skill Area 10  Ability to maintain continuous self-motivation.

In semester two (Figure 4.3.2) student perceptions were most positive for skill areas one and two and most negative for skill area ten, followed by three, five and six.

Figure 4.3.1  Summarisation of subjects LCI101, LAS100, LAC200, LAI240, LAI260, LAC300, LAI300, CIS11 (for skill areas 1 to 10) Semester One, 2002
Figure 4.3.2 Summarisation of subjects LAC100, LAI100, LCI101, LAI210, LAI230, LAS200, LAC320, LAI350 (for skill areas 1 to 10) Semester Two, 2002
Figure 4.3.3  Semester One GPA's for Levels one, two and three relative to each other

Figure 4.3.4  Semester Two GPA's for Levels one, two and three relative to each other

Figure 4.3.3 and Figure 4.3.4 show that there is very little variance between the levels of students as they progress through their degree program. Skill area 10, motivation is the most obvious common negative theme for students in semesters one and two. Figures 4.4.1 and 4.4.2 give a representation of the relative grade point
average (GPA) calculations for each subject for the purpose of an individual
differential perspective.

Figure 4.4.1  LCI101, LAS100, LAC200, LAI260, LAC300, LAI300, and
CIS11 GPA Calculation by Subject and Level, Semester One, 2002

Figure 4.4.2  LAC100, LAI100, LCI101, LAI210, LAI230, LAS200, LAC320, and
LAI350 GPA Calculation by Subject and Level, Semester Two, 2002
4.2.2 Learning Skills Inventory Skill Area 11 Analysis

During the student transcript content classification process eight distinct classifications were identified for the narrative analysis of skill area eleven. Each classification is in direct response to the single question of - what learning approach students perceive that they employ? Using the QOC notation (refer earlier Sections above) the following classification ‘options’ (O[n]) and ‘criteria’ (C[n]) were classified for this skill area:

O1 Utilitarian
   C1 Set goals, time management, planning, preparation
   C2 Do as required, completion of set work
   C3 Performance focus (assessment, grades, exams)

O2 Constructive
   C1 Constructs own understanding, problem solving
   C2 Reflects on mental models
   C3 Adjust models

O3 Disorganised
   C1 Disorder, jumbled
   C2 Perplexity, bewilderment, confusion
   C3 Fail to distinguish between

O4 Indolent
   C1 Avoidance, procrastination
   C2 Sluggish, unmotivated

O5 Motivation Issues
   C1 Motivation fluctuates
   C2 Works under pressure

O6 Unrelated response

O7 No response

O8 Minimalist Motivation
   C1 Get job done and no more
   C2 As for O1
The Table 4.5.1 and 4.5.2 represents the QOC classification ‘option’ percentages per subject per semester. In tables 4.5.1 and 2 the column representing ‘Minimalist Motivation’ O8 is to be read as a sub-set option percentage of the first option ‘Utilitarian’ O1.

<table>
<thead>
<tr>
<th>SUBJECT TITLE</th>
<th>Option Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O1</td>
</tr>
<tr>
<td>LCI 101</td>
<td>80.4</td>
</tr>
<tr>
<td>LAS 100</td>
<td>72.4</td>
</tr>
<tr>
<td>LAC 200</td>
<td>74.0</td>
</tr>
<tr>
<td>LAI 240</td>
<td>78.3</td>
</tr>
<tr>
<td>LAI 260</td>
<td>69.0</td>
</tr>
<tr>
<td>LAC 300</td>
<td>69.4</td>
</tr>
<tr>
<td>LAI 300</td>
<td>55.6</td>
</tr>
<tr>
<td>CIS 11</td>
<td>93.3</td>
</tr>
</tbody>
</table>

Table 4.5.1  Semester One skill area 11 percentages n=919

Figure 4.5.1  Graphical representation of Table 4.5.1. Results for skill area 11, Semester One, 2002.
## Table 4.5.2 Semester Two skill area 11 percentages $n=792$

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>Option Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O1</td>
</tr>
<tr>
<td>LAC100</td>
<td>63.3</td>
</tr>
<tr>
<td>LAI100</td>
<td>71.9</td>
</tr>
<tr>
<td>LCI101</td>
<td>75.3</td>
</tr>
<tr>
<td>LAI210</td>
<td>73.0</td>
</tr>
<tr>
<td>LAI230</td>
<td>72.1</td>
</tr>
<tr>
<td>LAS200</td>
<td>70.4</td>
</tr>
<tr>
<td>LAC320</td>
<td>79.2</td>
</tr>
<tr>
<td>LAI350</td>
<td>68.1</td>
</tr>
</tbody>
</table>

Figure 4.5.2 Graphical representation of Table 4.5.2. Results for skill area 11, Semester Two, 2002.
There is one subject that appears in both semester one and two (LCI101). This is a first year level one introductory subject that all students at Swinburne Lilydale must study upon entry to the undergraduate programs and is offered twice a year due to the volume of students presenting. In analysing the codified data it must be remembered that the learning skills inventory survey was administered during the first week of study for each semester. With this in mind the first observation that can be made is that approximately 80% of LCI101 semester one students reflected a Utilitarian approach to learning and 75% of LCI101 semester two students. A point to note is that students entering their learning skills perceptions for LCI101 in semester one were in fact representing a view that is carried forward from secondary (compulsory) education because they had not begun their tertiary subjects at this point, an enculturation that could be assumed is born out of the previous twelve years of schooling.

The next observation is that students retain a Utilitarian disposition in their learning approach throughout their undergraduate studies. The importance of this observation runs counter to Swinburne Lilydale’s policy of learner-centeredness and liberal education. There is an overt emphasis on Swinburne Lilydale staff to practise learner-centred pedagogy. The data clearly suggests that either this is not being implemented or students are not responding. For the most part, teaching staff are not trained in learning approaches of a constructive and learner-centric model and are most likely to adopt approaches to teaching they ‘know’ and think will assist students.

Changes or experimentation with pedagogy are made difficult in a system of regular student evaluation that measures student satisfaction with the subject content, teaching and assessment. Such an approach is counter intuitive to the promotion of alternative teaching and learning approaches, with any teacher scoring poorly in the survey being asked to explain. No evaluation is being made of the effectiveness of learning or attitudes by students to learning.

Finding 3 that Swinburne Lilydale inadvertently reinforces a student utilitarian enculturation through systemic practices that measure teaching performance not learning practice.
A further observation that can be considered problematic, from review of all the data for both semesters, is that minimalism – O8, disorganisation – O3, and lack of motivation – O4 are high percentages of the student responses. What is more disturbing is the increase in the volume of these responses for levels two and three students. The variables involved need identification and remedial action.

CIS11 (Semester One) is a subject that is taught totally by distance education and online. Students work from virtual learning materials provided through the ITSM Discipline learning environment that are identical in substance to those for LCI101 and use a virtual classroom to discuss the curriculum and materials. The virtual classroom operates similarly to that of face-to-face tutorial-workshops but using an eCoach in place of a classroom teacher. The student population comes from mature aged (greater than 25 years of age) re-entering education, part or full time, having spent time in the workforce and are often studying while remaining in the workforce. The level of utilitarian responses is obvious, and equally striking is the very low percentage of minimalism. From this it is clear that the students in CIS11 want to be studying and want performance-based results. The following section represents an analysis of student’s examination results as a correlative response to the above learning observations, that I conducted in 2002.

### 4.3 Examination Results Analysis

This section (formerly presented as a report to the ITSM Discipline staff) outlines the investigation I undertook and reported in 2003 of the nature of any changes to student examination results occurring after the implementation of Student Journals and WebCT learning management system in the Information Technology, Systems and Multimedia (ITSM) Discipline at Swinburne University of Technology, Lilydale.

Both the Learning Management System (LMS) WebCT and Student Journals were first implemented by the ITSM Discipline at the beginning of 2002. The previous learning management system, Elegant Solution, was not to be supported by the University beyond the end of 2001 and this created the need to implement a new learning management system. Student Journals were implemented as part of an
attempt to encourage students to become more independent and self-aware as learners.

An analysis was undertaken of exam results in each of the ITSM subjects which are assessed by examination and results in the first semester of 2002 compared with results over the previous iterations of the subject, in order to determine whether the implementation of WebCT and/or the Student Journals had resulted in any significant change in student exam results.

The analysis indicated that there was no reason to believe that exam results had significantly improved or declined in the semester as a result of the implementation of WebCT and the Student Journals.

Further investigation in future semesters might uncover a more delayed response to the implementation of WebCT and/or the Student Journals.

4.3.1 Background

The investigation into the possibility of changes in the exam results of undergraduate students studying in the ITSM Discipline after the implementation of a new learning management system, WebCT, and a new student assessment requirement, Student Journals, in undergraduate teaching programs required analysis.

The ITSM Discipline was one of the largest of 12 disciplines at Swinburne Lilydale. Both WebCT and Student Journals were first implemented in ITSM in Semester 1 2002. The Discipline Leader of ITSM requested that an investigation be carried out to establish whether the implementation of WebCT and Student Journals had resulted in any significant change in exam results in Semester 1 2002, for undergraduate students studying in the ITSM discipline.

4.3.2 WebCT

As a result of the announcement in late 2001 that the learning management system previously employed by ITSM, Elegant Solutions was not to be supported by the
University beyond the end of 2001, the ITSM discipline was required to shift to a new system at quite short notice.

The great majority of Swinburne Lilydale was required to use a system called TechniCal, however investigations by the Discipline Leader and his staff led him to believe that TechniCal was not sufficient for the discipline’s needs and as a result ITSM was given permission to implement WebCT.

The move to WebCT was given as a priority to two members of staff who liaised closely with technical staff to develop subject sites and a template for the ITSM subjects. Training was provided to subject convenors and support was given to them as they developed their new subject sites.

As expected there were a number of hitches, both technical and people related. These included server space limitations, chat room malfunctions, etc. Support provided by Melissa Smith (ITSM) and Paul Williams (Customised Training Development TAFE) helped staff to overcome these problems as the semester progressed.

### 4.3.3 Student Journals

Student Journals were implemented as part of an attempt to encourage students to become more independent and self-aware as learners.

Students were required to complete an online journal entry each week in each subject which included questions that guided them to consider their state as self-directed learners. The journals were mandatory in every ITSM subject, in some subjects they contributed to assessment and in other subjects they were hurdle requirements.

### 4.3.4 Method

Examination results data were obtained from Student Administration at Swinburne Lilydale for subjects in which assessment included examination, for the years 2000, 2001 and 2002. For each subject, in each iteration, the individual student exam results were entered into SPSS, and the mean examination result calculated. The
mean result indicates the average result out of a possible 50. Where the exam was scored out of a mark of less than or greater than 50 marks, the individual student results were scaled to be out of 50 to ensure comparability across iterations of a subject. Mean results were compared across the iterations of a subject to determine whether or not there was any significant difference between the mean examination results in Semester 1 2002, and those from previous subject iterations.

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Semesters Exam Results Analysed</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAC200</td>
<td>Programming</td>
<td>2000, Semester 1, 2001, Semester 1, 2002, Semester 1</td>
</tr>
<tr>
<td>LA1210</td>
<td>Database Concepts and Modelling</td>
<td>2000, Semester 1, 2001, Semester 1, 2002, Semester 1</td>
</tr>
<tr>
<td>LA1240</td>
<td>Electronic Communications and Applications</td>
<td>2000, Semester 1, 2001, Semester 1, 2002, Semester 1</td>
</tr>
<tr>
<td>LA1260</td>
<td>Human-Computer Interaction</td>
<td>2000, Semester 1, 2001, Semester 1, 2002, Semester 1</td>
</tr>
<tr>
<td>LA1300</td>
<td>Professional Reading &amp; Writing in Technology &amp; Culture</td>
<td>2000, Semester 1, 2001, Semester 1, 2002, Semester 1</td>
</tr>
<tr>
<td>LAM270</td>
<td>Multimedia Tools and Concepts</td>
<td>2001, Semester 1, 2002, Semester 1</td>
</tr>
<tr>
<td>LAS100</td>
<td>Software Engineering Concepts</td>
<td>2001, Semester 1, 2002, Semester 1</td>
</tr>
</tbody>
</table>
4.3.5 Results and Analysis

LAC200 Programming

<table>
<thead>
<tr>
<th></th>
<th>Semester 1, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>71</td>
<td>67</td>
<td>100</td>
</tr>
<tr>
<td>Mean exam result</td>
<td>27.1</td>
<td>29.8</td>
<td>30.0</td>
</tr>
</tbody>
</table>

The exam results for LAC200 Programming are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002.

LA1100 Information Systems Fundamentals

<table>
<thead>
<tr>
<th></th>
<th>Semester 1, 2000</th>
<th>Semester 2, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 2, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>191</td>
<td>80</td>
<td>199</td>
<td>87</td>
<td>155</td>
</tr>
<tr>
<td>Mean exam result</td>
<td>32.8</td>
<td>32.4</td>
<td>28.7</td>
<td>32.6</td>
<td>33.0</td>
</tr>
</tbody>
</table>

The exam results for LA1100 Information Systems Fundamentals are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002.

LA1210 Database Concepts and Modelling

<table>
<thead>
<tr>
<th></th>
<th>Semester 1, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>116</td>
<td>111</td>
<td>6</td>
</tr>
<tr>
<td>Mean exam result</td>
<td>30.3</td>
<td>33.4</td>
<td>35.2</td>
</tr>
</tbody>
</table>

The exam results for LA1210 Database Concepts and Modelling are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002. The significant decline in sample size is due to the fact that the subject was moved to Semester 2 for delivery in 2002.

LA1240 Electronic Communications and Applications
The exam results for LAI240 Electronic Communications and Applications are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002.

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Semester 1, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean exam result</td>
<td>89</td>
<td>52</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>30.5</td>
<td>29.8</td>
<td>28.4</td>
</tr>
</tbody>
</table>

LAI260 Human-Computer Interaction

The exam results for LAI260 Human-Computer Interaction are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002.

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Semester 1, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean exam result</td>
<td>84</td>
<td>128</td>
<td>162</td>
</tr>
<tr>
<td></td>
<td>31.6</td>
<td>34.5</td>
<td>33.4</td>
</tr>
</tbody>
</table>

LAI300 Professional Reading & Writing in Technology & Culture

The exam results for LAI300 Professional Reading & Writing in Technology & Culture are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002. The wide range of the means for examination results in this subject may be due to the change of teaching staff that took place in Semester 1, 2001.

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Semester 1, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean exam result</td>
<td>58</td>
<td>51</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>32.0</td>
<td>48.5</td>
<td>42.68</td>
</tr>
</tbody>
</table>

LAI320 Database Management Systems

The exam results for LAI320 Database Management Systems are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002.

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Semester 1, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean exam result</td>
<td>52</td>
<td>69</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>32.0</td>
<td>33.2</td>
<td>33.7</td>
</tr>
</tbody>
</table>

LAM270 Multimedia Tools and Concepts
<table>
<thead>
<tr>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Size</strong></td>
<td>43</td>
</tr>
<tr>
<td><strong>Mean exam result</strong></td>
<td>36.1</td>
</tr>
</tbody>
</table>

The exam results for LAM270 Multimedia Tools and Concepts are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002. It is worth noting the LAM270 was a new subject in 2001 and was significantly updated and then taught by a different staff member in 2002.

LCI101 Information Methods

<table>
<thead>
<tr>
<th>Semester 1, 2000</th>
<th>Semester 1, 2001</th>
<th>Semester 1, 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Size</strong></td>
<td>230</td>
<td>193</td>
</tr>
<tr>
<td><strong>Mean exam result</strong></td>
<td>30.1</td>
<td>31.7</td>
</tr>
</tbody>
</table>

The exam results for LCI101 Information Methods are not significantly different after the implementation of WebCT and Student Journals in Semester 1, 2002.

**4.3.6 Examination Results Findings Summary**

The examination results obtained do not show any evidence that the implementation of WebCT and Student Journals has had a significant impact on exam results in ITSM subjects taught in the first semester of 2002.

Further investigations in future semesters may show a delayed impact on examination results as students and staff become more familiar with the WebCT platform and Student Journals. Subjects taught in Semester 2, 2002 might also show an effect of the introduction of these two factors.

Other factors, such as subject redevelopment, teaching staff changes, etc, appear to have a greater impact on the examination results than the implementation of WebCT platform and/or Student Journals. It is also possible that the two factors mitigate against each other, with one having a positive affect and the other cloaking it with a negative affect on results. It would be interesting to investigate this further – perhaps by removing the requirement for Student Journals in one or two subjects and determining whether this had an impact on exam results.
4.4 Summary of Analysis

With the observations presented in this chapter comes the unresolved debate as to the merits of different models at undergraduate level. If students are used to transmission as a teaching approach and this approach is reinforced by an education system that is both content and performance oriented, then to change their thinking and practice presents as an extremely complex process.

Finding 4 ‘No significant difference’ is observable in the learning outcomes of students since the implementation of the ITSM Discipline learning environment. Equally there has been no significant impact in the student performance with the implementation of virtual learning guides and virtual lectures.

Suffice to say, that on the back of these data, ICT has not made learners more focused on learning or self-actualising. The only redeeming feature to this initiative is the student acknowledgement that the technology makes learning materials more readily available.

If learning-centric approaches are to be observed in students and valued by the Swinburne Lilydale community a major enculturation shift is required. Students are and will remain utilitarian and extrinsically motivated until they are convinced that an alternative is cognisant of their basic need of a degree and well-paid employment.

Consequently there is one main variable identified from the study to date, and that seems to be co-dependent with student motivation. It is the transition from a dependency to a self-actualised learning pedagogy perhaps surface to deep learning. As stated in chapter one and restated now - the observable lack of change in students’ learning approaches focuses my attention on the following quote:

… competencies inevitably breed an atmosphere where showing you can conform to the standards becomes the aim of teacher and student rather than engaging deeply with the subject and exploring. The result tends to be increasing conformity to group norms and the rise of mediocrity.
People become bound in their thinking by the limits of the system of competencies with which they have been presented.  
http://www.pianokeys.co.uk/regulation/article1.htm,  (last accessed 06/01/2003)

Toward the end of 2002, after the close of the data collection, I became aware of William Glasser’s work on ‘Choice Theory’. Glasser explains that:

… all of our behaviour is always our best attempt at the time to satisfy at least five powerful forces which, because they are built into our genetic structure, are best called basic needs. (2001 pp. 15, 16)

He continues that, “… these needs…range from the mostly physiological need to stay alive and reproduce to the four psychological needs belonging, power, freedom and fame” (2001 pp. 15, 16). Therefore, the following quote most illustrates the findings of the present study, “…a good school could be defined as a place where almost all students believe that if they do some work, they will be able to satisfy their needs enough so that it make sense to keep working.” (Glasser, 2001 p. 16)

I don’t think that the findings presented in this chapter could have come closer to the observation quoted above. The data and findings from the ITSM Discipline study relating to the approach used by most students and displayed during the learning-skills inventory questionnaire show that students are doing ‘some work’ and are satisfied with a pass in a subject in order to move to graduation.

Glasser further reinforces this when he states that:

“…what goes on in the outside would never ‘makes’ us do anything. All of our behaviour, simple to complex, is our best attempt to control ourselves to satisfy our needs, but, of course, controlling ourselves is almost always related to our constant attempt to control what goes on around us.” (2001, p. 19)
4.5 Student Learning Approaches

The study process of students, investigated by Bigg’s in the 1980’s, resulted in an instrument for the evaluation of student learning in higher education. Bigg’s Study Process Questionnaire (SPQ) was developed in 1987 as a 42 item self-reporting inventory and drew upon earlier works of students’ approaches to learning (SAL) (cf. Marton & Säljö 1979); Craik & Lockhart (1972); Biggs (1987, 1996) Ramsden & Entwistle (1981); Zeegers (2002).

There is a revised study process questionnaire R-SPQ (2001) published as part of a paper by Peter Zeegers (2002). This questionnaire forms the basis of reflection of the broad categories of ‘surface’ to ‘deep’ learning, for learning approaches analysis. The SPQ differentiates three broad categories of learning approach i.e. ‘deep’, ‘surface’ and ‘achieving’, and that each of these can be subdivided into ‘motivation’ and ‘strategy’. Bigg’s (1987) and other references also indicate that students will move between the various approaches. Deep learning is characterised by:

- A desire to understand
- Making sense of meaning
- Constructive understanding

Surface learning is characterised by:

- Minimalism
- Rote learning
- Outcome and reproductive focus

Achieving learning is characterised by:

- Performance
- Optimisation of effort
- Utility

Of importance to the present research is the findings from a study by Zeegers (2001) that found that students in a traditional undergraduate science course become less
deep in their learning approach as they progress through their course, and given that these results are for an Australian university they are most salient.

4.6 Summary

Chapter Four represents a Dissertation that investigated the learning skills and specifically the learning approaches of ITSM Discipline students studying in Semester one and two of 2002. I argue that there is no significant difference in learning approaches between the various undergraduate years particularly since the introduction of the ITSM Discipline learning environment in 2000. Such a finding must bring with it the conclusion that the ITSM Discipline learning environment has had no significant impact upon student learning approaches and does not seem to have enhanced their self-actualisation and self-motivation.
Chapter Five
Summary and Conclusions

5.0 Conclusions and Future Study

There is an implicit, if not explicit, assumption in literature that students come to learning as willing and constructive learners. However, as the present study has shown, students and teachers dip into different enculturations of learning and teaching dependent upon factors and expectations that are enacted through individual desires to control ‘what goes on around us’.

Broadly summarised:

1. A student can and will move between learning approaches independent of the teaching approach but dependent upon intrinsic motivation; and
2. A teacher can and will move between teaching approaches regardless of student’s learning approaches extrinsically imposed.

After five years of learning environment evolution (1997/8 to 2003), for the ITSM Discipline, and an overt move by academics to provide an Active Learning environment, there is “no significant difference” in how students approach learning. Student subject survey sampling by Swinburne indicates that some students persist in demanding a prescriptive content, not dissimilar to the surface and compliance focused learning approaches. I propose that some students and teachers will be minimalist and utilitarian when approaching the use of learning materials and teaching methods because of extrinsic social motives. These propositions can be shown to exist and shed light upon the limits of student learning agency. It has been my experience and the evidence shows that a majority of students are self-motivated but use surface study strategies.
Adjustment of the learning norms alone through ICT and pedagogy do not provide sufficient self-actualising learning motivation and strategies. Metaphorically, ‘if you are hungry you concentrate upon getting food, not growing it’. In the same way students desiring a career will concentrate upon the social norms relating to getting a degree and career, not upon constructing wider discipline and interdisciplinary perspectives for life-long learning. At present, I would argue that there is a social imbalance between passing and understanding, compliance and learning in contemporary studentship.

It could be argued that the status quo is not wrong and is in fact very relevant to an industrial economy and society seeking trained workers. However, there is much research to support the application of higher order or deep learning frameworks that will be desirable for life in information rich and service oriented post-industrial economies and societies. We are in transition between an industrial enculturation and a very different new post-industrial and humanist enculturation where versatility and rapid adaptability will be the hallmark of a new globalised economy and society.

A holistic ‘systems thinking’ analysis of the learning pedagogy, mapping both intrinsic and extrinsic relationships, could provide some insight into variables that could be manipulated to best overall effect for students and teachers in the foreseeable future. Many online and resource-based learning trials have been carried out over the past several decades. A number following constructive and learner-centred pedagogy (eg. Brooks & Brooks, 1993; Mergel, 1998; Mayer, 1999; Olsen, 1999), instructional design recommendations (eg. Johnson & Foa, 1989; Keller & Suzuki, 1988; Laurillard, 1993; Merrill, 1997a-c, 2000) and constructive and active learning (Meyers & Jones, 1993; Fink, 2003) formed the basis for the ITSM Discipline learning environment innovation. Observations by the ITSM Discipline staff and the research reported in this folio suggest that there continues to be no significant difference in learning behaviour. It could therefore be concluded that despite its rhetorical ardour the innovations of the ITSM Discipline learning environment were not able to redirect student learning approaches toward a deeper more self-actualised orientation.
The perceived lack of change by students and the following quotation support my contention:

…competencies inevitably breed an atmosphere where showing you can conform to the standards becomes the aim of teacher and student rather than engaging deeply with the subject and exploring. The result tends to be increasing conformity to group norms and the rise of mediocrity. People become bound in their thinking by the limits of the system of competencies with which they have been presented.
http://www.pianokeys.co.uk/regulation/article1.htm, (last accessed 06/01/2003)

However there is a paradox:

…we should look for pupils to be successful in exams of course, but much more than that we should be seeking to turn out young men and women who are hungry for learning, set firm on the track of life-long learning, not utilitarian learning, not ‘just in time’ amassing of facts but a love of learning, a delight in exploring new avenues.
http://www.hutchesons.org/association/activities.asp, (last accessed 06/01/2003)

The present study therefore proposed that:

The ITSM Discipline learning environment model enculturation for students, post 2000 enrolment would be positively predisposed to change their learning approaches from utilitarian to self-actualising (self-motivated and self-directed as learning collaborators).

This proposition was found not to have occurred in that there is no significant difference in student learning approaches resulting from the use of the ITSM Discipline learning environment which foregrounded flexibility, accessibility and student-driven learning.
There are several broad indicators that appear to determine students’ willingness and capacity to move from a utilitarian and minimalist learning approach to that of the ITSM Discipline learning environment active learning approach:

1. Pre-existing utilitarian education enculturation – represented by students entering university for the first time not having been exposed to the learning pedagogy of the Swinburne Lilydale or ITSM Discipline, (Evidenced by the ITSM Discipline learning skills inventory questionnaire of semester one for the subject LCI101);

2. A weakness in certain learning skills (ITSM Discipline learning skills inventory questionnaire) which persist through the term of a student’s studies for the period of their undergraduate studies – Evidenced by the learning skills inventory questionnaire (Skills areas, 3,5,6 and 10), student perceptions being the weakest;

3. The provision of significant and sufficiently self-contained learning materials using virtual/online computer-mediated approaches makes pragmatic performance focused assignments and examinations more easily adopted;

4. Education enculturation is at a turning point between industrial and post-industrial philosophies, economic globalisation and practices. This is a time of transition from one enculturation to another and this will take time, perhaps a long time; and

5. Educators are not trained to differentiate between the utilitarian and constructive paradigms nor do they have strategies or (University) systems support to instil constructive learning approaches.

Throughout this folio there are a series of research-based findings centred upon the ITSM Discipline learning environment development. I have seen that many students are willing to take charge of their education; however, there is a mixture of
perceptions as to what constitutes learning. This is highlighted in the words of one student where he suggests that:

Currently I am in a process where I try to take in as much information as possible, whether I already know it or not I make notes of the information and later sort through it to find the relevant pieces of information. Then I study this information and try to add it to my common knowledge so that it becomes second nature to me. (ITSM Discipline learning skills inventory questionnaire, 2002)

This student mentions that he is trying to “make sense of notes” and “constructing knowledge and skills”, very much the basis of an active learner. On the other hand the words of another student state that: “I do what has to be done” (ITSM Discipline learning skills inventory questionnaire, 2002), here the student seeks a clear pragmatic approach, focussing upon the assessment and content in the interest of complying with the expectations and measures associated with higher education. This is not to say that being strategic/pragmatic doesn’t preclude retaining some knowledge.

Students considered themselves poor goal setters (Skill area 6). Therefore it is clear that goals are an important focus to consider in curriculum design, reinforcing a duality of objective and subjective socialisation of learning. Students’ goal-setting could well be encouraged if the learning materials and tasks were to be constituted in time bounded pieces (eg. report study etc. each week or each two weeks) and that this be a managed process.

When describing their learning approach students did answer with moderate to high ability to Skill area 1 – able to question, inquire and problem solve, and Skill area 2 – able to keep an open mind. So the potential is there to engage a self-actualised and flexible learner-centred learning approach. There is not a great emphasis by students on contextualising their knowledge as a priority or on pondering concepts. This could be due to no real understanding of the work or employment they may enter at the conclusion of their studies.
I have reported the ITSM Discipline learning environment to date and shown the weaknesses in the current thinking both for the ITSM Discipline and for wider educational pedagogy. There is a saying, “train a child in the way they should go and they will not leave it all the days of their life” (Hebrew Proverb). This saying can be as true for negative behaviour and habits as it can for positive ones.

By the time students reach university they have normally experienced upwards of 12 years of institutional learning. The last two of these are heavily oriented toward attaining high grades. There is little room, it would seem, for self-actualisation. The extent to which such knowledge and history can be cast aside is considerably problematic.

Having explored the data collection and analysis of both Part I and Part II of the study, it is possible to explain what is happening within the ITSM Discipline that mitigates against students being more self-actualising as well as self-motivated in their learning and all parties constructively developing the learning experience. In short, the issue is not the technology; it is the entire learning enculturation. The student, staff and the wider society in Australia evidence strong pragmatic and utilitarian educational enculturation as a learning paradigm. This paradigm is, of course, managed and maintained through prescriptive administrative systems. If a change to a learner-centred educational enculturation or a blended enculturation is the objective then the current pedagogy and methodology must be subjected to further scrutiny and, in places, radical transformation.
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Folio


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www.wlv.sc.uk/~bu1821/files/self-dir.htm


http://www.harvard.edu/alps/thinking/does/article2.htm


Paper 4 References


Appendix 1 – LEB310 Subject Outline & Learning Guide

Subject Outline

LEB310
DESIGNING eCOMMERCE
AND eFS SYSTEMS

2005
Contents

Subject Outline:
LEB310 Designing eCommerce and eFS Systems

Lesson 1: How to Approach this Subject
Lesson 2: Enterprise Design Conceptual Framework (EDCF)
Lesson 3: Natural Design
Lesson 4: Systems Design
Lesson 5: Blueprint of a New Business/Organisation/Enterprise
Lesson 6: Establishing Connections
Lesson 7: Envisaging Change
Lesson 8: Prototyping as a Test of Design Viability
Lesson 9: Communicating the Enterprise Design
Subject Outline

Introduction

LEB310 Designing eCommerce and eFS Systems (here EFS means electronic Financial Services) provides you with a learning opportunity that investigates moving an innovation from the ‘great idea’ stage to become a real world enterprise. In this subject you are encouraged to look beyond the obvious design issues to consider holistic design strategy. The method be used is very much a self-directed and self-motivated learning approach focused through designing systems. You will be guided in your learning by reading the learning materials provided for this subject. There are three component parts:

- Subject Outline – Introducing the study, the assessment and schedules for this semester.
- Learning Guide – directing the areas of study and the pace of study. Constructed as a set of contextualised lessons with related learning, quite abstract in nature;
- Learning Objects – are contained as relevant blocks of knowledge within the Blackboard or WebCT learning management system.

Literature and computer resources – the library and Web, etc. are laden with relevant materials to assist your understanding. It may take a short while to become familiar with the structure of the learning materials but essentially for every lesson there will be one or more Learning Objects and related readings. Learning Objects provide conceptual knowledge while lessons draw together and contextualise the many pieces of knowledge you have gained over time.

eCommerce or eBusiness principles are all pervasive in the 21st Century world we live in and require us to think differently about business and organisation theories. These disruptive changes prompt either a reaction or need for new design. However, just being new and causing change does not guarantee success: good systems are required to be designed. These systems must ensure that the benefits of using the new commercial medium significantly outweigh potential risks and enculturation. Questions like ‘how do you design for trust?’ or ‘can privacy be respected?’ require design consideration.

Staff Team

Dr Bruce Calway (Subject Convenor)
Director, Centre for eBusiness and Communication
Swinburne University of Technology, Lilydale
Telephone: (03) 9215 7311
Fax (03) 9735 4713
Subject Details
LEB310 Designing eCommerce and eFS Systems is a third year subject in the Bachelor of Business (eCommerce). It may be selected as an elective in other degree programs, subject to prerequisites.

Duration
The subject is offered over a standard semester. The workload for this subject is expected to be between 10 - 12 hours per week, depending on prior knowledge and study skills. Approximately half of your study time will be used to become familiar with the subject content (attending lectures and tutorials, reading references and completing learning activities), while the remainder will be taken up with assessment tasks.

Prerequisites/Corequisites
LEB105, LEB210, LEB211.

Credit Points
This subject carries a weight of 12.5 credit points towards the Bachelor of Business (eCommerce) offered at Swinburne University of Technology, Lilydale.
Learning Outcomes

Upon completion of the **LEB310 Designing eCommerce and eFS Systems** studies you will have experienced a wide variety of tools and methods necessary for enterprise design. You will have exercised your abstract thinking and contextualising of the systemic requirements of human activity as they relate to a ‘great idea’ and the answers to the obvious ‘how do we do it?’ questions. You will describe, discuss and appreciate the design of systems that support both eCommerce and electronic Financial Services (eFS).

You will consider a variety of methods and techniques etc on your way to defining a methodology for providing organisation conceptual designs, included will be the demands of communicating visions of new realities and connecting them with real world perceptions of various individuals and culture.

Can I emphasise that it is your own thinking that will create for you the learning, not simplistic copying of others ideas or memorizing facts. Apply your knowledge of models value determination, etc in abstraction and contextualisation of concepts.

Completing these studies will not make you a designer or analyst. However, they will make you aware of the ‘what’ and ‘how’ of designing systems for eCommerce and eFS in the networked economy.

Learning Approach

The subject is structured as a Learning Template – essentially this is a philosophy and system for you to approach learning. The assumption is that you will have your own way of learning and an amount of knowledge and practice that will provide the foundation for you to make sense of the ideas presented in this subject.

The subject has an overall Learning Purpose and Learning Objective and a series of support materials as Lessons and Learning Objects. You will dip into these materials as and when you need. It is not assumed that you can remember everything or understand everything upon your first review of the materials.

The Lessons are an approach to provide a contextualized and partitioned collection of learning. These are essential to your understanding of ‘what’, ‘how’ and ‘why’ of particular abstractions of knowledge. Learning Objects are supportive in that they record the more static and conceptual knowledge.

Note that you are to be a self-directed and self-motivated learner and that the materials provided are a representative collection only. The classroom and online support are provided to support your efforts, and the reflective study journal assists in reviewing progress.
LEB310 includes three major activities to support your learning:

- **Firstly, private readings** – You are expected to read the suggested textbook chapters and research papers in order to gain a broad understanding of the topics under consideration.
- **Secondly, learning activities** – You will apply the knowledge gained from your reading to set exercises to prove you have a clear understanding. Completion of your lesson reviews prior to each lesson
- **Thirdly, classroom based studies** – You will actively share the topic material they have prepared. Classes will also contain lecture materials and case studies that will be presented.

**Graduate Attributes**

Swinburne University of Technology works to produce higher education graduates who are capable in their chosen profession. Learners bring to Swinburne University of Technology a diverse wealth of experiences and graduate with individual understandings, abilities and attitudes.

Within this context it is the intent of Swinburne that its higher education graduates:

- Are entrepreneurial
- Are capable in their chosen professional areas
- Operate effectively in work and community situations
- Are adaptable and manage change
- Are aware of environments.

(refer, Flexible Learning and Teaching Strategic Development Plan, 2002)

Your study in **LEB310 Designing eCommerce and eFS Systems** will contribute to developing these attributes in particular by:

- Taking a ‘great idea’ and conceptualising effective systems;
- Considering career opportunities in aspects of eCommerce, banking and finance relative to designing systems.

You will also develop an understanding of the multifaceted nature of business and be encouraged to take a strong conceptual focus in your learning, both independently and collaboratively in your group tasks. You may also begin to build your own reference collection to inform your professional activities.
# LEB310 Study Schedule 2005-S1

Assessments are always due by 5pm Friday in the week indicated. Check the timetable to confirm the actual class dates and times.

<table>
<thead>
<tr>
<th>Week</th>
<th>Lesson #</th>
<th>Activities and Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Feb 21 – 25&lt;br&gt;Lesson Introduction&lt;br&gt;Lesson 1</td>
<td>Complete Lesson 2 study journal</td>
</tr>
<tr>
<td>2</td>
<td>Feb 28 – Mar 4&lt;br&gt;Lesson 2</td>
<td>Complete Lesson 3 study journal</td>
</tr>
<tr>
<td>3</td>
<td>Mar 7 – 11&lt;br&gt;Lesson 3</td>
<td>Complete Lesson 4 study journal</td>
</tr>
<tr>
<td>4</td>
<td>Mar 14 – 18&lt;br&gt;Lesson 4</td>
<td>Complete Lesson 5 study journal</td>
</tr>
<tr>
<td>5</td>
<td>Mar 21 – Apr 1&lt;br&gt;Lesson 5</td>
<td>Complete Lesson 6 study journal</td>
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<tr>
<td></td>
<td><strong>Mid Semester Break</strong>&lt;br&gt;23 – 29 March inclusive</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>April 4 – 8&lt;br&gt;Lesson 6</td>
<td>Review Case Studies</td>
</tr>
<tr>
<td>7</td>
<td>April 11 – 15&lt;br&gt;Practice Test and Debriefing</td>
<td>Assignment 1 Due&lt;br&gt;Complete Lesson 7 study journal</td>
</tr>
<tr>
<td>8</td>
<td>April 18 – 22&lt;br&gt;Lesson 7</td>
<td>Complete Lesson 8 study journal</td>
</tr>
<tr>
<td>9</td>
<td>*April 25 – 29&lt;br&gt;Public Holiday</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>May 2 – 6&lt;br&gt;Lesson 8</td>
<td>Complete Lesson 9 study journal</td>
</tr>
<tr>
<td>11</td>
<td>May 9 – 13&lt;br&gt;Lesson 9&lt;br&gt;Putting it together</td>
<td>Assignment workshop</td>
</tr>
<tr>
<td>12</td>
<td>May 16 – 20&lt;br&gt;<em>Worked Case Study Presentations</em></td>
<td>Assignment 2 Due</td>
</tr>
<tr>
<td>13</td>
<td>May 23 – 27&lt;br&gt;<em>Worked Case Study Presentations</em></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>May 30 – Jun 3&lt;br&gt;<em>Study Week – no classes</em></td>
<td>Revise all topics so far</td>
</tr>
<tr>
<td></td>
<td><strong>DATE TBA</strong>&lt;br&gt;<em>FINAL TEST/Examination</em></td>
<td>Refer to exam timetable for details</td>
</tr>
</tbody>
</table>

* Public holiday during this week
References and Resource Materials

Recommended Texts
There is no set text for this subject instead it is recommended you read widely across the texts and published references.

Useful references


Ossimitz, G. *The Development of Systems Thinking Skills Using System Dynamics Modelling Tools* access via http://www.uni-klu.ac.at/users/gossimit/sdyn/gdm_eng.htm

McNamara, C. *Thinking About Organisations as Systems* http://www.mapnp.org/library/org_thry/org_sytm.htm

eBusiness Models (useful summary listing)
Rappa, M. *Managing Digital Enterprise* access via http://digitalenterprise.org/models

Soft Systems Methodology,
http://web.sfc.keio.ac.jp/~masanao/Mosaic_data/ssm.html

ITC503 Comparative Information Modelling – Topic 6,


Rich Pictures PowerPoint slides

In addition, students are encouraged to access relevant websites and to research other online resources.
Electronic Access
Enrolled students have access to online resources and electronic tools that enable access of learning materials, communication with other students or class meetings.

Assessment

Formal assessment
Whenever submitting an assessment for marking, you must also complete a cover sheet with your complete identification details. Attach the signed cover sheet to your assignment and submit to the
- Subject Assignment Box on Level 1 of the LA building Lilydale.

Or, post to
- Locked Bag 218, Lilydale 3140, Victoria.

A cover sheet is included on Page 14 of this section, and available for downloading from the subject website. Every document you submit for assessment must contain details of your identification on the first page/slide or within a footnote. The identification details on every document must contain your name, subject code and assessment task number.

Anonymous documents will not be marked.

<table>
<thead>
<tr>
<th>Description of task</th>
<th>Weighting</th>
<th>Due Date</th>
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<tr>
<td>1. Group Activity</td>
<td>20%</td>
<td>5:00pm April 15, 2005</td>
</tr>
<tr>
<td>2. Worked Case Study</td>
<td>50%</td>
<td>5:00pm May 20, 2005</td>
</tr>
<tr>
<td>3. Final Test/Examination</td>
<td>30%</td>
<td>Refer to exam timetable for details</td>
</tr>
</tbody>
</table>

Assessment will consist of a group-based piece of work, an individual piece of work, and an examination that verifies both learning and understanding.

Task 1. Group Activity weighting 20% toward final grade
For the group-based work you are to take a well documented design innovation (descriptive technology) such as the ‘printing press’, the ‘telegraph’, ATM or similar and analyse that innovation using the Enterprise Design Conceptual Framework (EDCF) (Calway 2004). You are to consider the design, implementation social enculturation, systems and the like. Look for positive, negative and neutral aspects to the design. You will be assessed on the thoroughness of your analysis, the insightfulness of your communications and the applications of the EDCF.

Due Week 7 - 5:00pm April 15, 2005
Task 2. Worked Case Study  

Your individual assessment will require you to design systems for an eCommerce and/or eFS innovation. You will be required to include all elements of your learning in this subject. Remember that there is no right or wrong answer – rather there is an expectation and thinking relative to design and in particular a singular enterprise design. Concepts and methodologies will need to be well described and applied in order to gain higher grades. This is an all of semester project and if not approached this way could result in failure in various aspects of the study.

Due Week 12 - 5:00pm May 20, 2005

Task 3. Final Test  

At the conclusion of all sessions you will be required to sit a written examination. You will be allowed to have your recommended textbooks and papers and reflective journal workbook with you during this exam, should you need to confirm any facts. However, the exam will be based on a case study and you will be expected to show your understanding of designing eCommerce and eFS systems, and not just copy from the textbooks or papers.

This verification of understanding examination is a 2 hour (plus reading time) test that must be passed in order to gain a pass in the subject overall, and in order that the group and individual assessments count towards your final grade.
General Assessment Criteria in Relation to Grades
The following descriptions can be used as a guide to what is expected in assessments:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Pass</td>
<td>Misses elements of the assessment as described</td>
</tr>
<tr>
<td>Less than 50</td>
<td>Insufficient understanding of key concepts</td>
</tr>
<tr>
<td></td>
<td>Irrelevant content for business</td>
</tr>
<tr>
<td></td>
<td>References not used appropriately</td>
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<tr>
<td></td>
<td>Incorrect use of terms</td>
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<tr>
<td></td>
<td>Poor expression, structure and flow</td>
</tr>
<tr>
<td>Pass</td>
<td>Covers all elements of the assessment as described</td>
</tr>
<tr>
<td>50 – 64</td>
<td>Demonstrated understanding of key concepts</td>
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<td>Relevant content for business</td>
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<td>Correct use of terms</td>
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<td>Clear expression, structure and flow</td>
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<td>65 – 74</td>
<td>Familiarity with references beyond the prescribed texts</td>
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<td>Correlation of concepts from related areas</td>
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<td>Greater relevance to the current business environment</td>
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<td>Distinction</td>
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<td>75 – 84</td>
<td>Synthesis of ideas from multiple sources</td>
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<td>Holistic view of the problem/solution for business</td>
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<td>Effective use of additional references, and application of theory to the business situation</td>
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<td>High Distinction</td>
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<td>85 – 100</td>
<td>Creation of original ideas/solutions, drawing on several sources to develop new perspectives which provide significant value to business</td>
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<td>Excellence in every area, including any related presentation</td>
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**Important Note:**
A pass in the final test and an aggregate mark of at least 50% is required to obtain a pass grade in this subject.
Learning Guide

LEB310
DESIGNING eCOMMERCE
AND eFS SYSTEMS
FORWARD

LEB310 Designing eCommerce and eFS Systems (here eFS means electronic Financial Services) provides you with a learning opportunity that investigates moving an innovation from the ‘great idea’ stage to become a real world enterprise. In this subject you are encouraged to look beyond the obvious design issues to consider holistic design strategy. The method be used is very much a self-directed and self-motivated learning approach focused through designing systems. You will be guided in your learning by reading the learning materials provided for this subject. There are three component parts:

- Subject Outline – Introducing the study, the assessment and schedules for this semester.
- Learning Guide – directing the areas of study and the pace of study. Constructed as a set of contextualised lessons with related learning, quite abstract in nature;
- Learning Objects – are contained as relevant blocks of knowledge within the Blackboard or WebCT learning management system.

Literature and computer resources – the library and Web, etc. are laden with relevant materials to assist your understanding. It may take a short while to become familiar with the structure of the learning materials but essentially for every lesson there will be one or more Learning Objects and related readings. Learning Objects provide conceptual knowledge while lessons draw together and contextualise the many pieces of knowledge you have gained over time.

eCommerce or eBusiness principles are all pervasive in the 21st Century world we live in and require us to think differently about business and organisation theories. These disruptive changes prompt either a reaction or need for new design. However, just being new and causing change does not guarantee success: good systems are required to be designed. These systems must ensure that the benefits of using the new commercial medium significantly outweigh potential risks and enculturation. Questions like ‘how do you design for trust?’ or ‘can privacy be respected?’ require design consideration.
Overview

Lesson Purpose
To develop an appreciation of an ‘enterprise driven’ design rationale; provide a systems-wide view and mapping of an enterprise; and consider the driving forces for entrepreneurial success in multi-unit international business.

Lessons Overview
Afuah and Tucci (2003) provide a conceptual framework\(^5\) for us to study designing eCommerce and eFS (electronic Financial Services) Systems. The emphasis is upon “Systems” not upon the new business or value propositions. We can assume by now that we have a “good idea” and that we are now required to provide a conceptual design\(^6\) for the new or redeveloped business. With a conceptual framework we also need a methodological approach for designing the systems of the future. Keep in mind that we are applying design principles in the pursuit of systems that may never have been considered before.

First then, how does the conceptual framework help us and secondly – is there an example we can use to assist our understanding of new and unfamiliar connotations. There are four elements to the Afuah and Tucci framework – Business Model, Environment, Internet, and Performance (Afuah and Tucci, 2003: cover).

\[\text{Refer Figure 2.1 Lesson 2 for detailed description}\]

However, we are going to take a more generalised use of the four elements. I have called them; Business and Enterprise Architecture; Environment and Infrastructure; Change and Agency\(^7\); and Performance and Outcome.

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\(^5\) Conceptual Framework – A statement of principles providing generally accepted guidance for the development of new reporting practices and for challenging and evaluating the existing practises. [http://wps.prenhall.com/wps/media/objects/461/472759/glossary.html](http://wps.prenhall.com/wps/media/objects/461/472759/glossary.html)

\(^6\) Conceptual Design – the initial rough design concept submitted to test initial broad response on critical design issues prior to any extensive design development.

\(^7\) Agency – the state of being in action or of exerting power; action; operation; a mode of exerting power; a means of producing effects.
Our first set of studies takes each of these elements (components, parts) and discusses both what they mean and why they are important. The examples we will use are 1) Johann Gutenberg’s printing press of the 15th Century, and 2) funds transfer using electronic means in the 19th Century.

The next group of studies focus upon systems thinking\(^8\) “systems design” using various tried and tested structured approaches. In particular we desire to understand the performance and outcomes that would already be specified and how a systems approach helps define the design requirements and conceptual design prior to the development phase of implementation. For this to be made practical we will use various systems development life cycle (SDLC) approaches (eg. Joint Applications Design, Rapid Applications Development, Prototyping) applied to electronic funds transfer and cash distribution. There are many texts in the libraries available for this study so students will be expected to take the learning initiative during this block of studies.

Design is inexorably driven by ‘people’ and ‘purpose’ and to this end we will study eCommerce and eFS from these perspectives. Why is it that we tolerate the frustrations of poor design when often a level of common sense could provide adequate alternatives? Design can be innovative, pragmatic, and adaptive in nature; subject to change from intrinsic (inside) and extrinsic (outside) agency. In this study we concentrate our efforts on applying what we have learnt, as a set of tools to the provision of ‘fitness for purpose’ design. Donald Norman provides the foundation paper for our thinking with his paper ‘The psychology of everyday things’ and we will elaborate on his approach of natural design throughout this study.

Lastly, we must prepare the design for communication; as a set of requirements; a feasibility prototype; and a conceptual ideal. How do you communicate complexity with oral and written means and to various interest groups? Equally who should be involved in the design and communications? To this end we review your prior studies in communication and add to these the socio technical consideration of research such as Mumford (1981) who were instrumental in the development of the ‘participative design’ methodology.

Therefore at the conclusion of our studies there will be a lot more questions than perhaps answers however, you will have developed an appreciation of an ‘enterprise-driven’ design rationale; provided a systems-wide view and

\(^8\) Systems Thinking – refer to [http://www.oly-wa.us/sqn/Glossary.htm](http://www.oly-wa.us/sqn/Glossary.htm); and the ability to think and act based on an understanding of how a system functions
mapping of an enterprise; considered the driving forces for entrepreneurial success in multi-unit international business; and worked in a team to capture and communicate a convincing elaboration of an eCommerce and/or eFS idea.

"For users to adopt Business-to-Consumer (B2C) e-commerce, it is imperative that the benefits of using this new commercial medium significantly outweigh potential risks and inconveniences. Indeed, difficulty of use and lack of trust with respect to online payment, privacy and consumer service have been found to constitute a real psychological barrier to e-commerce." (Florian N. Egger, Towards a Model of Trust for E-Commerce System Design)

Students are encouraged to look beyond the obvious design issues to consider a holistic⁹ enterprise enculturation¹⁰ and design strategy. A particular emphasis will be upon the eFS (electronic financial services) design strategies given the vast array of opportunities in the banking and finance sector.

**Learning Objectives**

Upon completion of the Designing eCommerce and eFS Systems studies you will have experienced a wide variety of tools and methods necessary for enterprise design. You will have exercised your thinking in abstraction and contextualising the systemic requirements of human activity as it relates to a ‘great idea’ and the answers to the obvious ‘how do we do it’ questions. You will describe, discuss and appreciate the design of systems that support eCommerce and electronic Financial Services (eFS).

You will consider a variety of methods and techniques etc. on you way to defining a methodology for providing organisation conceptual designs. These will include demands of communicating visions of new realities and connecting them with real world perceptions of various individuals and culture.

Can I emphasise that it is your own thinking that creates your learning, not simplistic copying of another person’s ideas or memorizing facts. Apply your knowledge of models value determination, etc. to the abstraction and contextualisation of concepts.

Completing these studies will not make you a designer or analyst however, they will make you aware of the ‘what’ and ‘how’ of designing systems for eCommerce and eFS in the networked economy.

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⁹ Holistic - Looking at the whole system rather than just concentrating on individual components. The overall sum can be greater than a simple totalling of the individual parts, because the "system" adds something in addition. Another term is "systems thinking". [http://ag.arizona.edu/futures/home/glossary.html](http://ag.arizona.edu/futures/home/glossary.html)

¹⁰ Enculturation – The process of a culture (one’s environment and all that it includes) shaping and influencing who we are and how we look at the world. [http://www.mhhe.com/mayfieldpub/kelly/chapter02/glossary.htm](http://www.mhhe.com/mayfieldpub/kelly/chapter02/glossary.htm) also, the processes by which people learn the ways of their culture.
Case Study
Afuah, A. and Tucci - Business Model Framework

Key References


Learning Activities
- Construct a reflective study journal for Lesson 1 (we will do this in our first class).

Terms and their usage
For a definition and for use of a particular word or term you are directed to resources such as Google (define:_________) for example,
- define: prototyping or define: systems design


Model – A prototype or surrogate of a complex situation http://aq.arizona.edu/futures/home/glossary.html

eFS definition – The “The engagement of eBusiness principles in the creation, conveyance, application, and deposition of finance.” (Calway 2004, Centre for eFS Position Summary - A Psychology of Electronic Financial Services.)
Accessing LEB310 on Blackboard

To access your Blackboard subject website, go to: 
http://mysubjects.swin.edu.au/ which gives the following page:

Your Username is your **seven** digit student number, and your Password is usually your date of birth, in the format ddmmyy. That is, if you were born on the 5th November, 1980 then your password would be 051180.

Click the **Login** button. If you are unable to login, please contact LTSHelp (LTSHelp@swin.edu.au) or (03) 9214 5295.

Once you have logged on, you will see the Blackboard Home page.
### ASSIGNMENT COVER SHEET

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### DECLARATION:

1. I / We hold a copy of this assignment which can be produced if the original is lost or damaged.
2. To the best of my / our belief, no part of this assignment has been copied from any other student’s work or from any other source except where due acknowledgement is made in the text.
3. No part of this assignment has been written for me / us by any other person except where such collaboration has been authorised by the lecturer concerned.

### SIGNATURE(S):

### LECTURER’S COMMENTS:

### RESULT:

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Assessment and Appeals Procedure
Please familiarise yourselves with the university’s procedures relating to student assessment and appeals. Copies are available on the Campus Wide Information Service at:

Students with Special Needs
Students with special needs and considerations should advise the Divisional Office and their subject convenor as early as possible. Please familiarise yourselves with the university’s procedures relating to students with special needs. Copies are available on the Campus Wide Information Service at:

Extensions Policy
1. This policy should be read in conjunction with the University’s Assessment and Appeals Procedures. It does not cover absence from an examination held during an official examination period. Such absence is covered by Section 11 of the University’s Assessment and Appeals Procedures.

2. An extension is the time between the due date originally set for submission of an item for assessment and a new due date for acceptance of the assessment item without incurring a late penalty.

3. Extensions for individual work will not normally be granted except in the case of illness or extenuating personal circumstances and only where supporting evidence has been provided to the subject convenor or nominee.

4. Extensions for group work will not normally be granted. Absence from group presentations will only be approved in the case of illness or other extenuating personal circumstances and only where supporting evidence has been provided to the subject convenor or nominee. Students who miss a group presentation as a result of an approved absence will be required to present their component of the presentation at a later date.

5. Written applications for extension must be made to the subject convenor or nominee on the appropriate form as soon as the student becomes aware of the need for an extension. Every effort should be made to notify the subject convenor or their nominee before the due date of the relevant piece of assessment.

6. Where the student has suffered an illness, the period of the extension granted will normally be equal to the number of days covered by the supporting medical certificate.

7. Poor planning and last minute equipment failure will not normally be grounds for an extension.
Late Penalties Policy
1. This policy should be read in conjunction with the University’s Assessment and Appeals Procedures and the Division of Swinburne, Lilydale’s Extensions Policy.

2. Pieces of assessment which carry a weighting of 10% or more towards a student’s final result shall incur a late penalty of 10% of the available marks for each day or part thereof that the assessment is late provided it is submitted within one week of the due date. Assignments submitted more than one week after the due date will receive a mark of zero.

3. Pieces of assessment which carry a weighting of less than 10% towards a student’s final result shall incur a late penalty of 1 mark for each day or part thereof that the assessment is late provided it is submitted within one week of the due date. Assignments submitted more than one week after the due date will receive a mark of zero.

Irregularities, Misconduct and Plagiarism

Irregularities – the unauthorised use or attempted use by or for any student of any means to gain unfair advantage in any examination, test, assignment, essay or other work, the marks for which form part of the final assessment. An irregularity includes misconduct and plagiarism.

Misconduct – an action by a student which is in breach of any directions issued by the Examination Room Supervisor, printed on the examination material or notices or specified by the Assessment and Appeals Procedures. This includes taking into an examination any unauthorised material with the intention of using said material to obtain and unfair advantage.

Plagiarism - Plagiarism is the action or practice of taking and submitting or presenting the thoughts, writings or other work of someone else as though it is your own work. Plagiarism includes any of the following, without full and appropriate acknowledgment to the original source(s):

(a) the use of the whole or part of a computer program written by another person;

(b) the use, in essays or other assessable work, of the whole or part of a written work from any source including but not limited to a book, journal, newspaper article, set of lecture notes, current or past student’s work, any other person’s work, a website or database;

(c) the paraphrasing of another’s work;
(d) the use of musical composition, audio, visual, graphic and photographic models,
(e) the use of realia, that is objects, artefacts, costumes, models and the like.

Plagiarism also includes the preparation or production and submission or presentation of assignments or other work in conjunction with another person or other people when that work should be your own independent work. This remains plagiarism whether or not it is with the knowledge or consent of the
other person or people. It should be noted that Swinburne encourages its students to talk to staff, fellow students and other people who may be able to contribute to a student’s academic work but that where independent assignment is required, submitted or presented work must be the student’s own.

Enabling plagiarism contributes to plagiarism and therefore will be treated as a form of plagiarism by the University. Enabling plagiarism means allowing or otherwise assisting another student to copy or otherwise plagiarise work by, for example, allowing access to a draft or completed assignment or other work.
Appendix 2 - Response to the Implementation of WebCT and Student Journals in Semester 1, 2002

Information Technology, Systems and Multimedia Discipline Staff at Swinburne University of Technology, Lilydale:

Response to the Implementation of WebCT and Student Journals in Semester 1, 2002.

August 2002

Prepared By Dr Bruce Calway (Director) and Tari Turner (Research Academic)
Centre for eBusiness and Communication
Swinburne University of Technology, Lilydale.
Appendices

Abstract
This report outlines the investigation into the perception by staff in the Information Technology, Systems and Multimedia (ITSM) Discipline at Swinburne University of Technology, Lilydale of the implementation of a new learning management system, WebCT, and a new student assessment requirement, Student Journals, in undergraduate teaching programs.

Both WebCT and Student Journals were first implemented in Semester 1 2002.

The previous learning management system, Elegant Solutions, was not to be supported by the University beyond the end of 2001 and this created the need to implement a new learning management system with relatively little notice.

Student Journals were implemented as part of an attempt to encourage students to become more independent and self-aware as learners.

The Discipline Leader was keen to receive feedback from staff as to their experience of the implementation of both WebCT and Student Journals.

After the end of the first semester in 2002, staff in the ITSM Discipline were asked to complete a survey consisting of 20 open-ended questions that were designed to elucidate their perception of the new WebCT system, its implementation and effectiveness, as well as their perceptions of the value of the Student Journals. The questions are included in the appendices.

All but one subject convener, and all WebCT support staff responded to the questions. Their responses were collated anonymously into one document which was presented to the Discipline Leader. It should be noted that due to the close working relationship within the group, in many cases the responses are immediately identifiable by other members of the group and the Discipline Leader – this was well known to respondents.
Background
This report outlines the investigation into the perception by staff in the Information Technology, Systems and Multimedia (ITSM) Discipline at Swinburne University of Technology, Lilydale of the implementation of a new learning management system, WebCT, and a new student assessment requirement, Student Journals, in undergraduate teaching programs.

The ITSM Discipline is one of the larger of 12 disciplines at the Lilydale Campus of Swinburne University of Technology. The discipline is led by a proactive, innovative Discipline Leader who places significant importance on ongoing improvement of subject content and delivery methods. The ITSM Discipline consists of a number of subject conveners, sessional staff and cadet tutors, as well as a handful of support staff who were employed on a casual basis during the period of transition to WebCT and Student Journals. Both WebCT and Student Journals were first implemented in Semester 1 2002.

WebCT
As a result of the announcement in late 2001 that learning management system previously employed by ITSM, Elegant Solutions, was not to be supported by the University beyond the end of 2001, the ITSM discipline was required to shift to a new system at quite short notice.

The great majority of the Lilydale campus was required to use a system called TekniCal however investigations by the Discipline Leader and his staff led him to believe that TekniCal was not sufficient for the discipline’s needs and as a result ITSM was given permission to implement WebCT.

The move to WebCT was given as a priority to two members of staff who liaised closely with technical staff to develop subjects sites and a template for the ITSM subjects. Training was provided to subject conveners and support was given to them as they developed their new subject sites.

As expected there were a number of hitches, both technical and people related. These included server space limitations, chatroom malfunctions, etc. Support provided by Melissa Smith (ITSM) and Paul Williams (Customised Training Development TAFE) helped staff to overcome these problems as the semester progressed.

Student Journals
Student Journals were implemented as part of an attempt to encourage students to become more independent and self-aware as learners.

Student were required to complete an online journal each week in each subject which included questions that guided them to consider their state as self-directed learners. The journals were mandatory in every ITSM subject, in some subjects they contributed to assessment and in other subjects they were hurdle requirements.

Processing of the student journals was problematic. There was some initial confusion amongst staff as to who was responsible, and analysis of the journals was delayed.
After the conclusion of the first semester 2002, the Discipline Leader requested that feedback be gathered on the process of transition to WebCT and the implementation of Student Journals.

**Method**

Initially the Discipline Leader requested that data be collected through one-on-one interviews, however as he was made aware of the significant workload placed on staff in preparation for the following semester, and the fact that some staff were also taking holidays, it was agreed that the data be gathered by questionnaire.

A questionnaire was developed in collaboration with the Discipline Leader and with the advice of Marianne McDowall (Lecturer, Centre for eBusiness and Communication). The questionnaire was then distributed to the subject conveners and staff involved in support of WebCT and Student Journals by email with a request that they complete it either electronically or in hard copy and return it to Tari Turner.

All but one of the questionnaires were eventually returned and the responses were collated into the format displayed below in Results. This data was then provided to the Discipline Leader and at his request distributed to the subject conveners.
Results

1. Is there any reflection about the process of moving to WebCT that you’d like to make?

“I felt that there was minimal time to upload materials onto WebCT as semester one drew nearer. It seemed as though the last 3-4 days before semester one started and during week one of semester was ‘upload overload’.”

“Realising that it was an enforced move, more time to upload and test would have made life easier, as well as confirming to students that we practise what we preach”

“Insufficient time and training allocated to using Dreamweaver and uploading into WebCT.”

“Sessional staff kept inadequately informed of the changes and the new procedures required.”

“Overall, it’s been a positive transition. However, there were times during the first semester where I wasn’t able to access the system. No doubt these problems have been or will be resolved as times goes on. There are always minor problems with such a huge transition.”

“Not really, it was the system chosen for us.”

“Personally I found WebCT a lot more difficult to use as a student than Elegant Solutions, and there were all the downtime of the server… Still, it got better the more comfortable I got with using it. And it was great fun picking it apart and make it work the way we wanted it to!”
2. How did you feel about changing to WebCT?

“No hang ups. Technology moves along – I expect to be dynamic and be in a dynamic environment working in ITS&M”

“‘Groan’; just as we had got Elegant Solutions working! Again, there was no other option, so it was a case of reluctantly accept and make the best of it”

“Preferred elegant solutions. However not adverse to changing as long as adequate time and training provided.”

“As I joined the ITSM department a month into first semester, I was unaware there was going to be such a change until I was informed of it’s existence.”

“Ok, it was stated that we would move to this system, and it would provide for our future needs.”

“Hey, I got a job out of it, so I’m personally very pleased. And I like the possibilities and extra tools offered.”
3. What were your expectations about WebCT?

“That it was going to be a longer process to upload materials initially”

**Were they correct?**

“First response – There does not appear to be any great difference – in that it supports the delivery of course materials online. The main differences I see, is that we can track student activity on the site (could we do that before? I don’t know.)

Second response – definitely Yes”

**Why or why not?**

“Second response – Yes. Why? Because initially there were browser problems that I was unaware of. After having a compatible browser installed (and version of that browser) there was no difficulty apart from slow server response (at least I think that is what it was.)”

“There appeared to be significant advantages (operational) over both Elegant Solutions and Teknical.”

**Were they correct?**

“Mostly correct, however, some features, such as linking learning objects over modules appears to be available only in Vista (vapourware??)”

**Why or why not?**

“Due to rushed implementation, some features were not explained or it was assumed we knew. E.g. setting up journals as a text box for students to enter their responses directly, rather than having to download, create Word docs and upload”

“That it would be a step backward from elegant solutions and that we would be starting from scratch again.”

**Were they correct?**

“Yes”

**Why or why not?**

“We did have to upload everything again and the process was more complicated and time consuming than expected. Also WebCT proved to be less reliable initially as it would often be unavailable or extremely slow in response time. Another problem was that the links often did not work.”

“Had none. Did not know the product. Was told that it would do what we wanted given that we would have to change our method of delivery and course structure.”

**Were they correct?**

“No!”

**Why or why not?**

“Too many shortcomings.”

“Too difficult to use.”

“Had to learn new tools and applications to use it.”

“None, had never even heard of it before.”
4. What were your expectations about the move to WebCT?

“That it would be fairly easy to manage – with some temporal issues.”

**Were they correct?**

“Yes and No”

**Why or why not?**

“see response to Question 3. Part Why? Above.”
5. How have you found the move to WebCT a good thing?

**For yourself?**
“I don’t see much difference from my perspective apart from the new idea of Lessons and Learning Objects being incorporated into the delivery of material – but that is not what you are asking I think?”
“Not particularly – the uploading of materials seems to take longer – there is more involved than the old system”
“But apart from initial teething problems, the move has been okay I guess.”

**For your students?**
“The main concern was browser compatibility – particularly from their homes. The occasionally unavailability of WebCT when the server went down – particularly at the beginning of Semester One.”
“Overall, Yes”

**For yourself?**
“With the only other viable option being Teknical, and judging from the responses of staff using that platform, definitely Yes!”

**For your students?**
“Again, it appears far preferable to Teknical, and with the upgrades, should prove more so”

**For yourself?**
“Not initially however I understand that it is more widely used in other universities therefore useful to know.”

**For your students?**
“As long as they understand how to use it I don’t think it matters to the students which online system we use.”

**For yourself?**
“The grading of journals is easily accessible and self-explanatory.”

**For your students?**
“Allows students to submit certain work requirements online, as well as being able to access all Learning Objects and Lessons for each subject.”

**For yourself?**
“WebCT was relatively easy to use so, having no experience with using it before I would say that it was a good thing.”

**For your students?**
“At the beginning of the semester, some of the students were experiencing difficulties using WebCT but these were usually addressed by the end of semester.”

**For yourself?**
“No”

**For your students?**
“Unknown, no feedback from them”

**For yourself?**
“Challenging, but I like that.”

**For your students?**
“It took them a while to get comfortable with how to use it, and where to find the material. Several students were doing other subjects than IT, and they found it rather confusing having to deal with different subject web pages.”
6. In what ways has the move to WebCT been challenging?

For yourself?
“Challenging is not the correct word for my response. The main issue was understanding Dreamweaver in a basic context to allow the manipulation of the htm pages before uploading them into WebCT and also getting the ‘concept’ of how to get a powerpoint presentation onto the server for student use. (That is, first you have to create a link in the htm page in Dreamweaver. Then save the page, close the page; access WebCT subject area, upload the htm file and the presentation file into the tree, refresh the student view and hope that it worked.) The process just described is vastly different to the old delivery system.”

For your students?
“I don’t think that it was too difficult apart from the understanding of those students who study in more than one discipline. You know – more than one delivery system, WebCT, Technical etc. (But that would have been going on forever I guess before WebCT came along.)”

“For yourself?
“Learning Dreamweaver, uploading into WebCT. Finding out how much I can and cannot do in a very short time frame.”

For your students?
“Getting to know a new online system.”

For yourself?
“No challenge at all. I’ve used an online system before, so it was just a natural progression.”

For your students?
“Initially, students found navigating through WebCT to be awkward, but these problems seemed to have been sorted out by getting used to the new online system”

For yourself?
“Some days, WebCT is astonishingly slow!”

For your students?
“Trouble uploading sometimes.”

For yourself?
“Learning new applications”
“How to place material in WebCT for students to access”

For your students?
“Unknown, no feedback “

For yourself?
“Had to take it apart, which was fun. And then be a student and revert to the way the centre had set up their pages, which was a little annoying at times. Really like the consistency between the ITSM web pages!”
7. How would you have improved the transition to WebCT?

For yourself?
“The time factor was a major issue for me. Having students waiting on OLA expecting the delivery of a complete course online – this was not possible when I had in effect to get four subjects uploaded within a few days, the server going down and my browser not compatible – it would have helped if the browser compatibility particularly, had been known earlier – much time was wasted over this point.”

For your students?
“Again the browser issue initially and the server going down.”
“Under the circumstances, the transition for both staff and students went as well as could be expected. More time to prepare would have made life considerably easier, but that was impossible due to other constraints”

For yourself?
“More time allocated to training, clearer explanations on the features of WebCT. A more definite idea of who to contact for assistance.”

For your students?
“Clearer instructions on how to use WebCT and who to contact when problems are experienced. (This should not be the responsibility of the individual conveners… we have enough to do)”

For yourself?
“Apart from not being able to access the server on several occasions, I found the transition to be no problem at all.”

For your students?
”Perhaps explained it’s importance and usage to students in more depth, as some students were confused about how it all worked.”

For yourself?
”Don’t know as I don’t know what it was like before.”

For your students?
”Perhaps having a printed version of instructions as to how to navigate through WebCT with all appropriate information may be of assistance.”

For yourself?
“Be clear about what it can and cannot do. What are the limitations of this system. How will it manage the material that differs between subjects. What needs to be done in order to use this system appropriately.”

For your students?
“Unknown”

For yourself?
“Not possible”

For your students?
“Don’t think I could have done more. Went through it step by step in class and one to one, and handed out all the material on how to use it. After that it’s really up to the individual student to work with the tools and get comfortable.”
8. How could you have been better supported in moving to WebCT?

“Yes, of having someone convert and upload all our programs, our support could hardly have been improved.”

“Given more time. Had more people available to offer assistance. Clear guidelines distributed to students on access to WebCT as well as who they could contact when problems encountered.”

“No problems.”

“Support was good.”

“I thought the support by Melissa was superb, informative, and available. I felt that she was placed in a difficult position and given a very difficult task in the time allowed.”

“Being made fully aware of the requirements and amount of work in providing the subject material online before moving to it.”

“If it involved using any new application, then training with it before any implementation.”

“As one of the startup crew we were pretty much on our own, but we managed. Some more courses or something from the TAFE people who had been using it for a while would have been good.”
9. What do you see as the pedagogical advantages/disadvantages of moving to WebCT?

“Not sure at this stage.”

“The ability (promised) of being able to link learning objects over subjects/modules“

“No different from elegant solutions.”

“I see WebCT as keeping with modern technology and allowing students to work more independently, which will force them to discipline themselves in their overall learning experience. The only disadvantage I perceive is the lack of human contact as all materials/assessments are online based. But I still think the advantages outweigh the disadvantages, as students are still able to speak with their tutors if they need any help.”

“Students have the opportunity to complete work in their own time and being able to access all of their work online is advantageous.”

“None, still trying to find places for information and course content.”

“Lots of possibilities, but I don’t think it very likely that lecturers will take the time to use WebCT more the absolutely necessarily as it takes time to get to a proficient level of usage.”
10. **What further improvements would you like to see made to the WebCT environment?**

“It needs to be more uploader friendly – and that is happening with this second semester – is good to see. More options need to be available for teaching staff to upload materials like supplementary materials etc.”

“Stronger links, over subjects, and common student portal”

“Improved links between lessons and learning objects. Clear instructions.”

“Maybe alter the navigation system, to make it easier for students to access their learning materials.”

“Running drop ins for example, at the beginning of semester to aid students in navigating WebCT may be helpful.”

“As above – suitable places to put information “

“That database we were talking about……”
11. What is your opinion of the value of the student journals?

For yourself?
“Last semester – no value – just a headache”

For your students?
“Last semester – no value (apart from 10% assessment in given in two subjects) – just a pain having to complete in some cases 4 journals every week.”

For yourself?
“For semester 1, zero, as we only received d reports AFTER semester 2 had started. With reporting within 2 weeks, as promised, very valuable in detecting common complaints in time to take corrective action. Also we can check whether students are actually learning”

For your students?
“They have to think about what they have learned for reinforcement, and it directs them into taking independent research”

For yourself?
“Up to this stage, no value at all. Hoping that changes as the questions are changed and the staff assigned to marking the journals give me some feedback during the semester (this time).”

For your students?
“Up to this stage, not much value at all. Hoping that changes to the questions will result in them thinking over their own learning process and coming up with ideas to enhance their own learning experience.”

For yourself?
“Adequate feedback on how students are finding their subjects provided they take the journals seriously.”

For your students?
“Given the appropriate questions are asked, it forces students to revise their subject material on a fortnightly basis as well as gives them an indication on how well they are performing.”

For your students?
“I think that the journals would be of more value to the students if the journal questions related directly to the subject content covered. If this was the case, with students answering these questions weekly, revision for the exam would be an ongoing process and of more benefit to the development of the students knowledge base.”

For yourself?
“Unsure”

For your students?
“Unknown, you will have to ask them.”
For yourself?
“NONE at all so far. Haven’t got any idea what my students did or wrote since I had nothing to do in reading and evaluating them”
For your students?
“None what so ever.”
12. How did you feel about implementing the student journals?

“Worried about being able to manage them.”

“Initially a positive reaction, but upon encountering problems with access, download and upload complications, it became more difficult to be enthusiastic about them “

“Initially resentful. More work to do with not enough time to do it. Also confused as to their purpose and unclear as to how I was supposed to assess the individual journals. I felt concern for the students as they were viewing them as yet another assessment task.”

“I’m not an actual tutor, so the student journals have no direct impact on me as I grade and summarise them.”

“Last semester I followed up each student journal entry, and followed up with the student – waste of time.”

“Don’t get me started! No positive feedback what so ever from the students, and I personally never got the point the way it was done this year and the inconsistencies between the subjects in how many journals was required, reporting on the content, how often they should be sent in, etc. I felt really bad for the students who handed in every week, and at the end of the year found out that 6 had been enough to get full marks. Especially since the questions could in no way help them towards their exam, and rather took up time they could have used for their own study.”
13. What were your expectations about the student journals?

“That they would be difficult to manage. Worried over student’s expectations.”

**Were they correct?**

“Yes – students virtually expected a phone call from teaching staff if they wrote they were having difficulty – instead of taking the initiative themselves – in the end they did. – Perhaps that is what should have happened – I don’t know.”

**Why or why not?**

“Answered above.”

“We would obtain a quick response to student reactions to the courses”

“With the large numbers of students, it became impossible for staff to check journals personally; therefore we relied on reports- which did not arrive”

“I had hoped that I could receive feedback on how the students were coping with my subjects and that I could address common problems by hopefully rectifying them. I had also hoped that students would be able to use the journals as a tool for learning and addressing how they tackle the subject tasks.”

**Were they correct?**

“No.”

**Why or why not?**

“The purpose of the journals had not been adequately explained to me nor my colleagues nor the students. No feedback was received by me nor the students of my subjects.”

“I thought that the journals would relate to the content covered in the lectures and that the questions would change each week!!!”

**Were they correct?**

“Nope.”

**Why or why not?**

“Questions were the same every week and not really applicable to subject content.”

“That students would take it seriously”

**Were they correct?**

“No”

**Why or why not?**

“You will need to ask them “

“The students were going to hate it, and nothing would really come of it to direct my teaching in any way”

**Were they correct?**

“Unfortunately, yes!”
14. How have you found the student journals a good thing?

For yourself?
“Not at all.”

For your students?
“No, not really.”

For yourself?
“The concept is good… The administration requires considerable improvement for the benefits to be realised; this should occur with the upgrade of WebCT and new reporting arrangements”

For your students?
“At first they were enthusiastic, then became bored with repetitive questions, weekly uploads and access problems. However, completing journals did make them think about the subject material and helped reinforce their learning.”

For yourself?
“To this stage, they have been a waste of time. I expect that to change for second semester.”

For your students?
“Difficult to answer on behalf of the students, however many expressed verbally that they felt they were a waste of time. Hopefully that will change for second semester.”

For yourself?
“Subject feedback.”

For your students?
“Self-Revision”

For your students?
“Not a bad thing but not a great thing either. This is because there is not further learning involved, it is just asking about the class!”

For yourself?
“No not from my current experience”

For your students?
“A waste of time. Just another thing to do “

For yourself?
“NO”

For your students?
“NO”
15. In what ways have the student journals been challenging?

For yourself?
“Answering multitudinous emails from disgruntled students, attempting to ascertain
the overall view”

For your students?
“Started dragging them out of their comfort zones of spoon feeding, but the process
was seriously hampered by technical problems e.g. access.”

For your students?
“Additionally the mark of 5% of overall assessment was seen as unworthy of the
amount of work required to complete them”

For yourself?
“Not”

For your students?
“Not”

For yourself?
“Having to grade all journals and summarise them with only one extra person
helping out. This semester will be easier since the journals have been made
fortnightly, 2 extra workers and being able to start as soon as the semester begins
rather than having had started the journals 4 weeks into the semester, which resulted
being far behind. It’s all good.”

For your students?
“Students have had to alter their time management schedule to be able to submit the
journals on time as well as come to terms with a new way of learning.”

For your students?
“Some times the questions do not apply. Particular questions were not understood
and nobody explained it to the students correctly. If they asked a cadet for help, the
cadet told them to ask someone else and so on!”

For yourself?
“Defend them in front of the students when I really didn’t see the point myself. Also,
when asking 4 different lecturers what one of the questions was really about I got 4
different answers.”

For your students?
“Having to figure out what the questions meant since they in no way fit in with the
subject material, lectures or labs. I still haven’t figured the questions out myself so
how would they?”
16. How would you have improved the implementation of the student journals?

For yourself?
“Less journals over the semester”

For your students?
“Better questions”

For yourself?
“Utilising a phased approach, less frequent uploads, and checking the capabilities of WebCT BEFORE implementing them at all”

For your students?
“Better explanation of the reason for journals, backed up with proof that were being read and action taken where appropriate”

For yourself?
“Change questions. Clearer understanding. More TIME!!!!”

For your students?
“Less frequency of journals. Change questions. Clearer understanding.”

For yourself?
“N/A”

For your students?
“Explained the purpose more and changed the questions so they are not only repetitive, but reflect more about the actual topic material.”

For yourself?
“Get access earlier. Have clear guidelines and expectations so that people do not receive conflicting information.”

For your students?
“Explain the purpose a great deal more clearly at the start of the semester. Let the students know that by filling in journal questions, their chances of successfully passing both the assignments and the exam are increased.”

For yourself?
“Have a clearer understanding of the purpose of the journal. I have some vague ideas of what this journal is but others have other vague ideas. There is no universal understanding amongst staff of why it is required, and the primary purpose of it.”

For your students?
“It stands to reason that if I have a complete understanding of the purpose and requirements, then I can impart on students the value of such a journal.”

For yourself?
“Asked relevant questions for the different subjects. That way I could have seen the point. Also, if the replies are meant to help us develop the subjects it would be good to have the report on the content week by week so I could actually do something about it!”

For your students?
“Relevant questions that would help their learning!”
17. How could you have been better supported in moving to the journals?

“Short of having someone convert and upload all our programs, our support could hardly have been improved”
18. **What do you see as the pedagogical advantages/disadvantages of the student journals?**

“They attempt to have the student working each week on their studies”

“Advantages: Makes students think for themselves – or helps to – and starts them on the road of becoming independent learners”

“If questions are viewed as repetitive, irrelevant or just plain boring, they quickly lose enthusiasm and journals then have a negative effect”

“Students will reflect on their learning process. Staff may review approaches to teaching that will cater for different styles hence also learning about learning.”

“Tutors will have direct feedback from the students so they are aware of any changes, which need to be made to the subject as well as student’s performances as a whole. However, a large amount of students have not taken their journal seriously, which could cause problems.”

“Being encouraged to think about what they have been taught as they go along is beneficial rather than leaving it all to the end when they are studying for exams.”

“None at present, until the above conditions are met.”
19. What further improvements would you like to see made to the student journals?

“We have drawn up a set of generic questions that will be used for every subject. Running them fortnightly and making the mark worthwhile should improve their usefulness.”

“To make the questions more relevant to the weekly topics. However, I’m told that is happening for when journals start on Monday. So, we can only wait and see how that pans out.”

“Questions that are relevant to course material that change weekly or fortnightly, that cover the areas that the students are expected to know for the exam.”

“If I had a better understanding of the purpose of the journal, then I could frame questions more appropriately to get the desired/requires responses. Students may find this exercise more useful also.”

“Relevant questions asked in an understandable way. And a set number of journals, used by all subjects.”
20. Are there any other comments you’d like to make?

“No except I need more TIME to implement all these changes not to mention spending time to answer these questions. For me, these transitions and expectations whilst also trying to redevelop subjects have led to so much frustration and stress.”

“Yes, what is the intended purpose of this survey, and who will be using it? What actions/outcomes can I expect from this survey?”
Analysis
Only a very broad view analysis of the data was undertaken as it was thought that given the nature and passion of the responses it was important that the Discipline Leader read through them in their entirety. It appears that responses gathered were useful, open and authentic.

WebCT
Essentially subject conveners would have liked more time to implement WebCT. They identified that they would have liked more training in both WebCT and Dreamweaver and would have appreciated more input into the process of choosing and moving to WebCT, as well as more time to develop high quality materials in WebCT. They also highlighted the need for better student support in terms of instructions for using WebCT and noted that some key features of WebCT that were initially attractive were in fact not implemented (sharing learning objects between subjects for example)

Some staff stated that they had preferred the previous (now unsupported) system, whilst others acknowledged that given that a change had to be made WebCT was a better option than TekniCal.

The staff who were involved in technical support for the transition to WebCT were basically positive or ambivalent about the new technology. They too identified that some useful functions were still not being used, but were otherwise relatively content.

Student Journals
The feedback received on the implementation of Student Journals was almost entirely negative. Very few staff had found the journals to have been of any value to themselves or their students, and most had significant issues with their implementation.

Subject conveners stated that they didn’t understand the value or outcomes of the journals and that their students couldn’t be expected to either. They noted that the journals were just another thing to do, and that they were repetitive and “a waste of time”.

Some staff had hope that in future iterations that journals would be more useful both for themselves and their students. They suggested that reducing the number of questions or making them more relevant to each week’s content would be an improvement.

Conclusion
The authentic and open nature of the responses gathered indicates the level of trust that is present amongst the staff of the ITSM discipline.

The strong negative tone of some of the responses gathered indicate that there is a need for quick, responsive action to overcome past negative experiences as well as to set the foundation for ongoing improvement.
I would encourage the Discipline Leader to involve the staff in discussions about the implementation of Student journals in particular in the coming semesters to ensure that they achieve the outcome he intended in implementing them, as well as ensuring that they don’t become an additional arduous burden on staff.

The responses also show opportunities for ongoing incremental improvement in the WebCT system, and the positive comments about the level of support highlight that Melissa Smith and her team should be applauded for her efforts in supporting the ITSM staff through a difficult transition.
Interview Questions for ITSM Staff re WebCT

1. Is there any reflection about the process of moving to WebCT that you’d like to make?

2. How did you feel about changing to WebCT?

3. What were your expectations about WebCT?
   Were they correct?
   Why or why not?

4. What were your expectations about the move to WebCT?
   Were they correct?
   Why or why not?

5. How have you found the move to WebCT a good thing?
   a. For yourself?
   b. For your students?

6. In what ways has the move to WebCT been challenging?
   a. For yourself?
   b. For your students?

7. How would you have improved the transition to WebCT?
   a. For yourself?
   b. For your students?

8. How could you have been better supported in moving to WebCT?

9. What do you see as the pedagogical advantages/disadvantages of moving to WebCT?

10. What further improvements would you like to see made to the WebCT environment?

11. What is your opinion of the value of the student journals?
    a. For yourself?
    b. For your students?

12. How did you feel about implementing the student journals?
13. What were your expectations about the student journals?
   Were they correct?
   Why or why not?

14. How have you found the student journals a good thing?
   a. For yourself?
   b. For your students?

15. In what ways have the student journals been challenging?
   a. For yourself?
   b. For your students?

16. How would you have improved the implementation of the student journals?
   a. For yourself?
   b. For your students?

17. How could you have been better supported in moving to WebCT?

18. What do you see as the pedagogical advantages/disadvantages of the student journals?

19. What further improvements would you like to see made to the student journals?

20. Are there any other comments you’d like to make?
Appendix 3 – Skills Inventory Analysis

3.1 Semester 1, 2002 Percentage results

### Ability to Question, Inquire and Problem Solve. (Q1) Semester 1

![Graph showing percentage results for Q1] - Table below the graph shows the percentage of 1's, 2's, 3's, and 4's for each subject.

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### Ability to Keep an Open Mind to Other Points of View. (Q2) Semester 1

![Graph showing percentage results for Q2] - Table below the graph shows the percentage of 1's, 2's, 3's, and 4's for each subject.

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Ability to Scan Data and Quickly Choose Relevant Resources. (Q3) Semester 1

Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4) Semester 1
Appendices

Ability to Assess Your Performance using that Data. (Q5) Semester 1

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Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6) Semester 2

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Appendices

Ability to Make a Firm Commitment to Working on a Goal. (Q9) Semester 1

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Ability to Maintain Continuous Self-Motivation. (Q10) Semester 1

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Results for Question 11 - Semester 1

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3.1.1 Information Methods (LCI 101) Results for Semester 1, 2002

### Ability to Question, Inquire and Problem Solve. (Q1)

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### Ability to Keep an Open Mind to Other Points of View. (Q2)

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### Ability to Scan Data Quickly and Choose Relevant Resources. (Q3)

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### Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

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### Ability to assess your performance using that data. (Q5)

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### Ability to translate learning needs into learning goals, plans and activities. (Q6)

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### Ability to set goals to improve present performance. (Q7)

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### Ability to observe and model others performance to improve. (Q8)

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### Ability to make a firm commitment to working on a goal. (Q9)

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### Ability to maintain continuous self-motivation. (Q10)

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3.1.2 Software & Application Development Concepts (LAS 100) Results for Semester 1, 2002

Ability to Question, Inquire and Problem Solve. (Q1)

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Ability to Keep an Open Mind to Other Points of View. (Q2)

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Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)

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Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

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Ability to Assess Your Performance using that Data. (Q5)

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Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)

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Ability to Set Goals to Improve Present Performance. (Q7)

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Ability to Observe and Model Others’ Performance to Improve. (Q8)

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Ability to Make a Firm Commitment to Working on a Goal. (Q9)

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Ability to Maintain Continuous Self-Motivation. (Q10)

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3.1.3 Programming (LAC 200) Results for Semester 1, 2002

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<tr>
<td>Ability to keep an open mind to other points of view. (Q2)</td>
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<tr>
<td>Ability to scan data and quickly choose relevant resources. (Q3)</td>
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<tr>
<td>Ability to collect data on performance through self-observation and feedback from others. (Q4)</td>
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<tr>
<td>Ability to assess your performance using that data. (Q5)</td>
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<tr>
<td>Ability to set goals to improve present performance. (Q7)</td>
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<tr>
<td>Ability to translate learning needs into learning goals, plans and activities. (Q6)</td>
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<tr>
<td>Ability to make a firm commitment to working on a goal. (Q9)</td>
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<tr>
<td>Ability to observe and model others performance to improve. (Q8)</td>
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<tr>
<td>Ability to maintain continuous self-motivation. (Q10)</td>
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3.1.4 Electronic Communications and Applications (LAI 240) Results for Semester 1, 2002

- **Ability to question, inquire and problem solve. (Q1)**
  - Count: 0 7 43 19
  - Response N=69

- **Ability to keep an open mind to other points of view. (Q2)**
  - Count: 0 9 37 23
  - Response N=69

- **Ability to scan data and quickly choose relevant resources. (Q3)**
  - Count: 0 19 38 12
  - Response N=69

- **Ability to collect data on performance through self-observation and feedback from others. (Q4)**
  - Count: 0 1 9 3 8 1 2
  - Response N=69

- **Ability to assess your performance using that data. (Q5)**
  - Count: 2 16 45 6
  - Response N=69

- **Ability to translate learning needs into learning goals, plans and activities. (Q6)**
  - Count: 12 2 3 79
  - Response N=69

- **Ability to set goals to improve present performance. (Q7)**
  - Count: 1 16 40 12
  - Response N=69

- **Ability to observe and model others performance to improve. (Q8)**
  - Count: 1 8 46 14
  - Response N=69

- **Ability to make a firm commitment to working on a goal. (Q9)**
  - Count: 0 20 29 20
  - Response N=69

- **Ability to maintain continuous self-motivation. (Q10)**
  - Count: 1 24 32 12
  - Response N=69
3.1.5 Human Computer Interaction (LAI 260) Results for Semester 1, 2002

Ability to question, inquire and problem solve. (Q1)

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Ability to keep an open mind to other points of view. (Q2)

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Ability to scan data and quickly choose relevant resources. (Q3)

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Ability to collect data on performance through self-observation and feedback from others. (Q4)

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Ability to assess your performance using that data. (Q5)

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Ability to translate learning needs into learning goals, plans and activities (Q6)

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Ability to set goals to improve present performance. (Q7)

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Ability to observe and model others performance to improve. (Q8)

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Ability to make a firm commitment to working on goal. (Q9)

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Ability to maintain continuous self-motivation. (Q10)

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### 3.1.6 IT Professional and Ethical Issues (LAC 300) Results for Semester 1, 2002

#### Ability to question, inquire and problem solve. (Q1)

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Response N=62

#### Ability to keep an open mind to other points of view. (Q2)

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Response N=62

#### Ability to scan data and quickly choose relevant resources. (Q3)

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Response N=62

#### Ability to collect data on performance through self-observation and feedback form others. (Q4)

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Response N=62

#### Ability to assess your performance using that data. (Q5)

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Response N=62

#### Ability to translate learning needs into learning goals, plans and activities. (Q6)

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Response N=62

#### Ability to set goals to improve present performance. (Q7)

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Response N=62

#### Ability to make a form commitment to working on a goal. (Q8)

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Response N=62

#### Ability to observe and model others performance to improve. (Q9)

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Response N=62

#### Ability to maintain continuous self-motivation. (Q10)

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Response N=62
3.1.7 Professional Reading & Writing in Technology & Culture (LAI 300)
Results for Semester 1, 2002

- Ability to question, inquire and problem solve. (Q1)
- Ability to keep an open mind to other points of view. (Q2)
- Ability to scan data and quickly choose relevant resources. (Q3)
- Ability to collect data on performance through self-observation and feedback from others. (Q4)
- Ability to assess your performance using that data. (Q5)
- Ability to translate learning needs into learning goals, plans and activities. (Q6)
- Ability to set goals to improve present performance. (Q7)
- Ability to observe and model others performance to improve. (Q8)
- Ability to make a firm commitment to working on a goal. (Q9)
- Ability to maintain continuous self-motivation. (Q10)
### 3.1.8 Information Methods (CIS 11 - OLA) Results for Semester 1, 2002

**Ability to question, inquire and problem solve. (Q1)**

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**Ability to keep an open mind to other points of view. (Q2)**

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**Ability to scan data and quickly choose relevant resources. (Q3)**

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**Ability to collect data on performance through self-observation and feedback from others. (Q4)**

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**Ability to assess your performance using that data. (Q5)**

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**Ability to translate learning needs into learning goals, plans and activities. (Q6)**

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**Ability to set goals to improve present performance. (Q7)**

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**Ability to observe and model others performance to improve. (Q8)**

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**Ability to make a firm commitment to working on a goal. (Q9)**

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**Ability to maintain continuous self-motivation. (Q10)**

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### 3.2 Semester 2, 2002 Percentage results

#### Ability to Question, Inquire and Problem Solve. (Q1) Semester 2

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#### Ability to Keep an Open Mind to Other Points of View. (Q2) Semester 2

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Appendices

Ability to Scan Data and Quickly Choose Relevant Resources. (Q3) Semester 2

- % of 1's: 0.85, 0, 0.43, 0, 0, 0, 0, 0
- % of 2's: 22.22, 21.05, 17.75, 11.11, 18.03, 11.25, 16.67, 30.56
- % of 3's: 59.83, 61.4, 65.37, 63.49, 57.38, 57.5, 52.08, 52.78

LAC 100 n= 117 | LAI 100 n=57 | LCI 101 n=231 | LAI 210 n=128 | LAI 230 n=61 | LAI 200 n=80 | LAC 320 n=48 | LAI 350 n=72

Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4) Semester 2

- % of 1's: 0, 1.75, 0.87, 0, 0, 0, 0, 0
- % of 2's: 18.8, 10.53, 11.26, 13.49, 14.75, 17.5, 10.42, 5.56
- % of 3's: 61.54, 77.19, 62.77, 63.49, 62.3, 56.25, 64.58, 73.61
- % of 4's: 19.66, 10.53, 23.81, 23.02, 22.95, 26.25, 22.92, 20.83

LAC100 n= 117 | LAI100 n=57 | LCI101 n=231 | LAI210 n=128 | LAI230 n=61 | LAI200 n=80 | LAC320 n=48 | LAI350 n=72
Appendices

Ability to Assess Your Performance using that Data. (Q5) Semester 2

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Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6) Semester 2

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Ability to Set Goals to Improve Performance. (Q7) Semester 2

Ability to Observe and Model Others Performance to Improve. (Q8) Semester 2
### Ability to Make a Firm Commitment to Working on Goals. (Q9) Semester 2

<table>
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### Ability to Maintain Continuous Self-Motivation. (Q10) Semester 2

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<td>% of 3's</td>
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<td>% of 4's</td>
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### RESULTS FOR QUESTION 11 - SEMESTER TWO

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The table above shows the distribution of subjects for different courses in Semester Two. The percentages indicate the number of students who fall into each category for each course.
3.2.1 Computing Fundamentals (LAC 100) Results for Semester 2, 2002

**Ability to Question, Inquire and Problem Solve. (Q1)**

- Count: 0, 11, 83, 23

**Ability to Keep an Open Mind to Other Points of View. (Q2)**

- Count: 0, 2, 58, 57

**Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)**

- Count: 1, 26, 70, 19

**Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)**

- Count: 0, 2, 27, 22, 3

**Ability to Assess Your Present Performance using that Data. (Q5)**

- Count: 1, 15, 81, 20

**Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)**

- Count: 4, 33, 3, 4

**Ability to Set Goals to Improve Present Performance. (Q7)**

- Count: 2, 20, 66, 29

**Ability to Observe and Model Others’ Performance to Improve. (Q8)**

- Count: 1, 16, 65, 35

**Ability to Make a Firm Commitment to Working on Goals. (Q9)**

- Count: 0, 30, 62, 25

**Ability to Maintain Continuous Self-Motivation. (Q10)**

- Count: 5, 42, 54, 18
Appendices

3.2.2 eCommerce and Business Computing Apps (LAI 350) Semester 2, 2002

Ability to Question, Inquire and Problem Solve. (Q1)

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Ability to Keep an Open Mind to Other Points of View. (Q2)

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Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)

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Responses n=72

Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

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Responses n=72

Ability to Assess Your Performance using that Data. (Q5)

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Responses n=72

Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)

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Responses n=72

Ability to Set Goals to Improve Performance. (Q7)

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Responses n=72

Ability To Observe and Model Others Performance to Improve. (Q8)

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Responses n=72

Ability to Make a Firm Commitment to Working on Goals. (Q9)

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Responses n=72

Ability to Maintain Continuous Self-Motivation. (Q10)

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Responses n=72
Appendices

3.2.3 Advanced Programming & Systems Project (LAC320) Semester 2, 2002

### Ability to Question, Inquire and Problem Solve. (Q1)

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### Ability to Keep an Open Mind to Other Points of View. (Q2)

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### Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)

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### Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

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### Ability to Assess your Performance using that Data. (Q5)

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### Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)

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### Ability to Set Goals to Improve Performance. (Q7)

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<tbody>
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### Ability to Observe and Model Others Performance to Improve. (Q8)

<table>
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### Ability to Make a Firm Commitment to Working on Goals. (Q9)

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### Ability to Maintain Continuous Self-Motivation. (Q10)

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3.2.4 Systems Analysis & Design (LAS 200) Semester 2, 2002

**Ability to Question, Inquire and Problem Solve. (Q1)**

- Number of Responses: 70
- Count: 0, 4, 18, 58

**Ability to Keep an Open Mind to Other Points of View. (Q2)**

- Number of Responses: 50
- Count: 0, 3, 39, 18

**Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)**

- Number of Responses: 50
- Count: 0, 9, 25, 46

**Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)**

- Number of Responses: 50
- Count: 0, 14, 21, 45

**Ability to Assess Your Performance using that Data. (Q5)**

- Number of Responses: 50
- Count: 0, 3, 4, 15, 3

**Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)**

- Number of Responses: 50
- Count: 0, 8, 23, 49, 4

**Ability to Set Goals to Improve Performance. (Q7)**

- Number of Responses: 50
- Count: 1, 10, 49, 20

**Ability to Observe and Model Others Performance to Improve. (Q8)**

- Number of Responses: 50
- Count: 0, 8, 19, 53

**Ability to Make a Firm Commitment to Working on Goals. (Q9)**

- Number of Responses: 50
- Count: 0, 13, 21, 46

**Ability to Maintain Continuous Self-Motivation. (Q10)**

- Number of Responses: 50
- Count: 0, 24, 14, 42
3.2.5 Management Support Systems (LAI 230) Semester 2, 2002

### Ability to Question, Inquire and Problem Solve. (Q1)

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### Ability to Keep an Open Mind to Other Points of View. (Q2)

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### Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)

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### Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

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### Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)

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### Ability to Observe and Model Others Performance to Improve. (Q8)

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### Ability to Make a Firm Commitment to Working on Goals. (Q9)

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### Ability to Maintain Continuous Self-Motivation. (Q10)

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3.2.6 Database Concepts & Modelling (LAI 210) Semester 2, 2002

### Ability to Question, Inquire and Problem Solve. (Q1)

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### Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)

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### Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

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### Ability to Assess Your Performance using that Data. (Q5)

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### Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)

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### Ability to Set Goals to Improve Performance. (Q7)

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### Ability to Observe and Model Others Performance to Improve. (Q8)

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### Ability to Make a Firm Commitment to Working on Goals. (Q9)

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### Ability to Maintain Continuous Self-Motivation. (Q10)

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### 3.2.7 Information System Fundamentals (LCI 101) Semester 2, 2002

#### Ability to Question, Inquire and Problem Solve. (Q1)

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#### Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)

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#### Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

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#### Ability to Assess Your Performance using that Data. (Q5)

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#### Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)

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#### Ability to Observe and Model Others Performance to Improve. (Q8)

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#### Ability to Make a Firm Commitment to Working on Goals. (Q9)

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#### Ability to Maintain Continuous Self-Motivation. (Q10)

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3.2.8 Information Methods (LAI 100) Semester 2, 2002

Ability to Question, Inquire and Problem Solve. (Q1)

Ability to Keep an Open Mind to Other Points of View. (Q2)

Ability to Scan Data and Quickly Choose Relevant Resources. (Q3)

Ability to Collect Data on Performance through Self-Observation and Feedback from Others. (Q4)

Ability to Assess Your Performance using that Data. (Q5)

Ability to Translate Learning Needs into Learning Goals, Plans and Activities. (Q6)

Ability to Set Goals to Improve Performance. (Q7)

Ability to Observe and Model Others Performance to Improve. (Q8)

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