Developing an integrated e-learning culture: a model grounded in the Australian Army experience

Diane Newton
Southern Cross University
Developing an Integrated E-learning Culture: A model grounded in the Australian Army experience

Diane Patricia Newton
BA MEd(T&D) DipLib DipEd DipEnvStud

Submitted in total fulfilment of the requirements of the degree of
Doctor of Philosophy
Southern Cross University
January 2007
Declaration

I certify that the work presented in this thesis is, to the best of my knowledge and belief, original, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for a degree at this or any other university.

I acknowledge that I have read and understood the University's rules, requirements, procedures and policy relating to my higher degree research award and to my thesis. I certify that I have complied with the rules, requirements, procedures and policy of the University (as they may be from time to time).

Print Name: ………………………………………………………………………

Signature: ………………………………………………………………………

Date: ………………………………………………………………………
Abstract

Understanding the influences on e-learning effectiveness in workplaces is a necessary, but contentious task. The transfer of knowledge about e-learning from higher education to workplace situations has resulted in discursive tensions between expectations and practice. Measurement of the aspects of e-learning effectiveness is often discussed in the literature in terms of discrete economic, pedagogical and technological criteria. Few studies have investigated e-learning use in terms of the complexity of factors in a workplace environment and there is a scarcity of relevant substantive models of e-learning effectiveness factors in workplace contexts. This study aimed to improve understanding of the factors influencing e-learning effectiveness, particularly in large, dispersed workplaces and to develop a model based on the understanding of these factors.

This study represents the first external research into the Australian Army’s e-learning projects. The Army was selected as a large, dispersed workplace organisation with ten years experience in designing and using multimedia rich CD-ROM learning materials. The Army had undertaken trialing and evaluation of its e-learning courses prior to providing substantial infrastructure for implementation in training centres. These evaluations indicated e-learning effectiveness in terms of training efficiencies and learning outcomes that at least matched traditional face-to-face classroom instruction. That is, that e-learning fitted with the training requirements. The study was aimed at the understanding of how the Army’s workplace environment was influencing the effectiveness of e-learning courses from multiple perspectives.

Using an inductive Grounded Theory approach provided an established analytical method for developing a substantive model. While the field-based research was limited to a single organisation, it included multiple sites across Australia and a cross-section of e-learning activities and respondents throughout the organisational hierarchy. The main data source was 101 open-ended interviews conducted with respondents at Army bases or by phone. Where interviewing was not possible due to Army operational concerns, questionnaires were used (129 responses). Other data sources included Army documents and the researcher’s observations and participation in e-learning classes.
While the Army’s internal evaluation processes had justified the adoption of e-learning courses, it was evident in the study that the interaction of factors within the Army’s culture was influencing perceptions and experiences of e-learning effectiveness. An Integrated E-learning Culture Model (IECM) based on the analysis of stakeholder perspectives in the Army is presented. The IECM is based on the four factors that emerged as influencing e-learning effectiveness, which were organisational priorities, the learning environment, the instructor’s role and learners’ needs. The main concern for respondents was to manage tensions associated with these four factors by integrating e-learning into the organisational culture. That is, e-learning effectiveness was discussed in terms of a process of alignment of the e-learning culture with the organisational culture.

Comparison of the IECM with some empirical studies of e-learning use in other large, dispersed workplaces indicates its relevance outside the Army context. An E-learning Comparative Alignment Framework (ECAF) for using the IECM in other research was developed in this study. Further comparison of the ECAF with alignment theories from related research disciplines suggests areas for further theoretical research. This thesis proposes that by adopting the perspective that e-learning environments are not value-free, it is possible to identify and align the competing priorities and discourses that influence how e-learning effectiveness is constructed and experienced in an organisation.
Acknowledgements

Developing a thesis involves the considerable support and encouragement from a very wide range of people. It is both a journey of self-discovery and a demand on those people closest to you. Thank you to my husband, Ian, for his unconditional love and support, as always, and to my sons, Michael and Aaron. Thanks to Mum, Dad and my sister, Robin who have always encouraged me to have a go and to explore what I can do.

My PhD supervisor, Assoc Prof Allan Ellis, provided constant enthusiasm and mentoring for me to develop and grow as a researcher during my candidature. He always made time available to provide relevant and insightful comments that kept me on track. His encouragement has assisted in the development of my academic writing and publication skills and output. His support included assistance in writing nine refereed publications during the research period for this study. Allan encourages writing during candidature to gain experience in academic publishing and to obtain external peer review and feedback, which proved very useful in developing this thesis.

Thank you to the soldiers and other Army staff members who so willingly gave their time and feedback for this research. Their cooperation and enthusiasm to participate under very tight organisational pressures and high-level workloads is appreciated. In particular, I would like to thank LT COL Andre Greenberry of the Army’s Training Technology Centre, Sydney. His enthusiasm and support for e-learning use in the Army encouraged others to participate in and to support this research. Andre’s support extended to Headquarters Training Command-Army providing $10,000, which provided funding for travel expenses for data collection and publication.

The Point of Contact for the research provided further essential Army support. The people involved were MAJ Kevin Ashford-Rowe (January 2004-April 2004), MAJ Paul Ashman (May 2004-June 2005) and MAJ Kate McVay (June-Dec 2005). I would like to mention Kevin for negotiating the initial bureaucratic stages of the research so competently and enthusiastically. I would like to extend another thank you to Paul, who demonstrated considerable support and interest in this research. His enthusiasm and ability enabled me to continue the research despite some tight deadlines and often politically charged
situations. Paul’s involvement in this research has extended to his recent enrolment in a PhD at Southern Cross University (SCU). I wish him well in his studies.

Financial support was also gratefully received from the Graduate Research College, SCU. In particular, I would like to thank Prof Peter Baverstock who supported my application for an Australian Postgraduate Association-Industry (equivalent) scholarship. This scholarship was essential in enabling me to undertake this research and was my main financial support through the thesis, which it enabled me to complete in a three-year period. I have also received two SCU Internal Research Grants (with Allan Ellis). These grants assisted in paying for research costs. I also received funding from the GRC Publication Bonus scheme that assisted me to attend three national conferences to present refereed papers. I was also grateful to receive two GRC post-graduate conference presentation grants to attend two international conferences to present refereed papers based on this research. Attendance at these conferences provided a wonderful opportunity to present and discuss the research with large international audiences. The Enterprise Development and Research Institute-SCU (Dr Stephen Kelly, Director) also provided financial support for accommodation for me to present a refereed paper at the E-learn 2006 conference. I also received financial support from the School of Social Sciences, SCU and I would like to thank the Head of School, Assoc Prof Michelle Wallace.

Thank you to Shyamalika Heffernan who did an excellent job proof reading the thesis.
Refereed publications from the thesis

The research from this thesis is published in nine refereed publications and a major report. Two of these publications have received awards at international conferences.


Education, Chesapeake, VA,

## Abbreviations

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<th>Description</th>
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ADEL</td>
<td>Army Doctrine Electronic Library</td>
</tr>
<tr>
<td>ADL</td>
<td>Advanced Distributed Learning</td>
</tr>
<tr>
<td>AFLF</td>
<td>Australian Flexible Learning Framework</td>
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<tr>
<td>ANTA</td>
<td>Australian National Training Association</td>
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<td>AQF</td>
<td>Australian Qualifications Framework</td>
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<td>ASTD</td>
<td>American Society for Training and Development</td>
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<tr>
<td>CBL</td>
<td>Computer Based Learning</td>
</tr>
<tr>
<td>DEST</td>
<td>Department of Education, Science and Technology</td>
</tr>
<tr>
<td>DET</td>
<td>Distance Education and Training</td>
</tr>
<tr>
<td>DOMAIN</td>
<td>Defence Online Management and Information Network</td>
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<tr>
<td>DRN</td>
<td>Defence Restricted Network</td>
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<tr>
<td>ECAF</td>
<td>E-learning Comparative Alignment Framework</td>
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<tr>
<td>EIU</td>
<td>Economist Intelligence Unit</td>
</tr>
<tr>
<td>e.p.</td>
<td>electronic publication</td>
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<tr>
<td>ICT</td>
<td>Information and Communication Technologies</td>
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<tr>
<td>IECM</td>
<td>Integrated E-learning Culture Model</td>
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<tr>
<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>LAN</td>
<td>Local Area Network</td>
</tr>
<tr>
<td>LMS</td>
<td>Learning Management System</td>
</tr>
<tr>
<td>LT COL</td>
<td>Lieutenant Colonel</td>
</tr>
<tr>
<td>MAJ</td>
<td>Major</td>
</tr>
<tr>
<td>NCVER</td>
<td>National Centre for Vocational Education Research</td>
</tr>
<tr>
<td>POC</td>
<td>Point of Contact</td>
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<tr>
<td>RTC</td>
<td>Regional Training Centre</td>
</tr>
<tr>
<td>RTO</td>
<td>Registered Training Organisation</td>
</tr>
<tr>
<td>SCU</td>
<td>Southern Cross University</td>
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<tr>
<td>SI</td>
<td>Senior Instructor</td>
</tr>
<tr>
<td>SOE</td>
<td>Standard Operating Equipment</td>
</tr>
<tr>
<td>Subject 1 CPL</td>
<td>Subject One (Corporal)</td>
</tr>
<tr>
<td>TAFE</td>
<td>Technical and Further Education</td>
</tr>
<tr>
<td>TBT</td>
<td>Technology Based Training</td>
</tr>
<tr>
<td>TECHSIM</td>
<td>Technology-Simulation Development Project</td>
</tr>
<tr>
<td>TMP</td>
<td>Training Management Package</td>
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<tr>
<td>TTC</td>
<td>Training Technology Centre</td>
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<tr>
<td>VET</td>
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Chapter 1 Introduction

The range of competing priorities and discourses across various education and training situations influence the understanding of e-learning effectiveness factors. The interactive and competing aspects of what is important, to whom, when, where, how and why contribute to the complexity. Organisations that do not have training as their main purpose but rely on training to maintain a skilled and competent workforce can have added difficulties in determining the variables that reflect e-learning effectiveness. There are significant gaps in the available substantive research literature based on workplace experience and a scarcity of models to guide practitioners and researchers. This study uses an inductive research approach to improve the understanding of the factors influencing e-learning effectiveness from multiple perspectives. The analysis of these factors informed the development of a model of factors influencing e-learning effectiveness in a large dispersed organisation.

The Australian Army is a large dispersed organisation that has over ten years experience in using e-learning courses as a core part of its soldier training. This study is the first external research undertaken into the Australian Army’s e-learning projects. The study was aimed at understanding how the Army’s workplace environment was influencing the effectiveness of the e-learning courses and the e-learning environment. This study did not aim to summarise, critique or review the Army training evaluation processes, nor did it aim to replicate its extensive training evaluation activities. An inductive research approach was selected to explore the factors influencing the design, development and experiences of e-learning course use in the Army from multiple perspectives.

A Grounded Theory approach (Glaser & Strauss 1967) was adopted as being the most suitable to achieve the research aims as it provides an established process for developing a substantive model by comparatively analysing respondents’ perspectives. Respondents were Army personnel involved in e-learning management, instructional design, course development, teaching and learning. That is, the e-learning effectiveness factors for this study emerged from the respondents’ perspectives. While the Army is a specialised context for researching e-learning effectiveness factors, the study provides insights into the influence of the traditional training culture and the challenges and opportunities...
experienced by a wide range of stakeholders. The model developed from this research can be applied to other large workplace situations.

The presentation of the chapters and the use of existing literature in the research reflect the inductive research approach. An outline of the chapter presentation as it relates to the inductive thesis development is presented in section 1.7. Each chapter provides a cumulative presentation of the overall thesis development. Therefore, this chapter:

• provides background to the study (1.1)
• presents the research aims and questions (1.2)
• outlines the research approach adopted (1.3)
• discusses the scope of the study (1.4)
• provides definitions of relevant terms used in the study (1.5)
• outlines the research ethics approval processes (1.6)
• provides a summary outline of the chapters (1.7)
• presents a conclusion to the chapter (1.8).

1.1 Background to the study

The literature review completed for this study indicated that despite the increasing use of e-learning approaches there is still a scarcity of available workplace-based research about e-learning effectiveness factors (Chapter 2). While measurement of the aspects of e-learning effectiveness is often discussed in the literature in terms of discrete economic, pedagogical and technological criteria, few studies have investigated the complexity of factors in a workplace environment. Therefore, this study aims to contribute to the gaps identified in the literature about how workplace contexts influence perceptions and experiences of e-learning effectiveness.

The Australian Army was selected as a large, dispersed workplace with over ten years experience in developing and using e-learning approaches. As there has been no previous external research into the Army’s e-learning program, it was typical of many large workplace organisations where considerable internal research and evaluation into e-learning processes had been undertaken but this research was not available in the public
arena. This study was a sign of the Army’s increasing openness and willingness to develop an understanding of the factors influencing e-learning effectiveness.

An overview of the development of the Army’s e-learning projects prior to the commencement of this study in late 2003 is provided in section 2.4.4. In brief, the Army has been involved since 1996 in developing, trialing and delivering stand-alone multimedia CD-ROM e-learning course packages. As the Army trials indicated that using the e-learning courses could provide training efficiencies and an effective learning environment, extensive e-learning course infrastructure was developed in Regional Training Centres (RTCs) around Australia from 2000. Since 2000, the Army’s Training Technology Centre (TTC) has developed over fifty of the e-learning packages. The e-learning courses focus primarily on providing all-corp military skills and knowledge and they have become an integral part of the Army’s training schedule. Soldiers attending residential training periods complete e-learning modules in classrooms in tandem with practical training and assessment. Thus, the Army was not using networked e-learning delivered through the Internet or using online collaborative tools, although it did undertake trials of networked delivered courses and distance learning during the study period.

The military context does require specialised knowledge and skills that potentially provide additional challenges for e-learning use. While the Australian Army is a specialised context for researching e-learning effectiveness factors, it has many similarities to other large, dispersed workplace organisations. For example, in the Army there is a focus on providing relevant and standardised training across the organisation, regardless of the trainees’ location (Headquarters Training Command 2003). The Army as a Registered Training Organisation (RTO) also provides nationally accredited training competencies through the Australian Quality Training Framework (Department of Defence Australia 2006b). Other large public service organisations that require standardised training for dispersed employees working in mission-critical environments have adopted e-learning courses, such as ambulance services (Australian Flexible Learning Framework 2004a) and police services (Australian Flexible Learning Framework 2004b). It is crucial for these organisations to understand the impact of e-learning approaches on training outcomes and to use the e-learning environment effectively within their context.

My previous research and work experience in different e-learning situations has led to an interest in the influence of contextual factors on the priorities and design of e-learning
course design and use (Newton & Hase 2001; Newton, Hase & Ellis 2002; Newton & Ledgerwood 2001; Newton & Newton 2000; O'Reilly, Ellis & Newton 2000a; O'Reilly, Ellis & Newton 2000b; O'Reilly & Newton 2001a, 2001b). This research and experience indicated that there is a diversity of assumptions and expected outcomes associated with e-learning course use across education and training contexts. In my Master’s thesis, the factors influencing e-learning implementation in a large, dispersed industry that had yet to implement e-learning; the Queensland mining industry where investigated (Newton 2002). This work has proved to be a valuable research experience. From this experience, the value of using an inductive, exploratory approach to understand the experiences of respondents within the context of their e-learning environments was gained. Highlighted by this experience was that the assumptions often made about effective e-learning approaches in the higher education sector do not always suit all organisations or learning situations. This previous research indicated that the development of e-learning models based on collaborative, networked e-learning design can conflict with the training priorities for competency-based workplaces, particularly those that require practical skill competencies.

Beyond attending a conference presentation by a senior manager from the Army’s Training Command (Sercombe 2000), I had no previous experience or knowledge of the Army or its training activities. By using contacts from a Southern Cross University’s (SCU) teaching program for the Australian Army, it was possible to initiate contact with staff at the Army’s Technology Training Centre (TTC). The initial meetings with TTC staff members in late 2003 provided the support required to undertake the study.

It was evident that the Army’s e-learning projects have been previously closed to external research and that gaining access to stakeholders would require formal Army approval procedures. Negotiating access to respondents involved cooperation with the Army’s Headquarters Training Command and consideration of the Army’s operational and training requirements. However, this requirement also provided insights into the Army’s hierarchical organisational culture and management structures. The support and cooperation of the TTC staff and Regional Training Centre (RTC) managers greatly facilitated the research progress.

The selection of the Army as a basis for this study was not to focus on summarising the military context for effective e-learning use. The aim rather, was to explore the factors
influencing e-learning effectiveness in this large, dispersed workplace from multiple perspectives that would be relevant to this context and to develop a model, which would be useful for practitioners and researchers in other contexts.

1.2 Research aims

From the initial discussions with the Army Training Command managers, it was evident that there was interest in gaining a broad perspective of the factors influencing the effective use of e-learning courses. The training managers made many suggestions of potential areas for research based on the Army’s ten years experience of designing, developing, delivering, using and evaluating e-learning courses. While they were satisfied that using e-learning courses was, in general, meeting training outcome requirements, there was interest in the understanding of factors that were influencing the effectiveness of the e-learning design and the e-learning environment. There was general support for undertaking exploratory research to understand the soldier’s perspective of e-learning effectiveness as a basis for further research.

Therefore, the research aims developed from the gaps identified in the research literature, the interests of stakeholders and the researcher’s interests. The focus of the study was kept broad to allow the issues to emerge from the respondents’ experiences. The research aims were:

- to understand the factors that are influencing effective e-learning in the Australian Army, and
- to develop a model of factors influencing e-learning effectiveness in large, dispersed workplaces.

The research questions were:

- What factors are influencing effective e-learning in the Australian Army?
- How does this understanding of influences inform the development of a model of e-learning effectiveness in large, dispersed workplaces?
In addition, a personal and professional aim for the study was to develop my writing and publishing skills during the thesis candidature by progressively submitting the research findings for publication. I had some experience of publishing during my Master’s thesis candidature (Newton & Hase 2001; Newton, Hase & Ellis 2002) and I valued the peer review and feedback processes. Based on the research for this PhD study, this decision resulted in nine refereed papers being accepted for publication (p. vi). The peer review process was a valuable experience that assisted in the development of the thesis. Publishing progressively also assisted in meeting the Army’s requirements for interim reports and a final report to the Army Headquarters Training Command (Newton 2005) during the study.

1.3 Research approach

As there were insufficient research studies with a theoretical basis to form hypotheses for the study, an inductive approach was selected and an established inductive research method used in the social sciences, Grounded Theory (Glaser & Strauss 1967) was adopted. As this method provides a comparative analytical process that allows the concerns of respondents to inform the development of a model, it was most suitable for meeting the aims of the research.

To gain an in-depth understanding of the respondents’ concerns, the main data collection method was face-to-face, open-ended interviews conducted with personnel at Army bases. Some phone interviews were necessary due to Army’s operational and training requirements for instructors. Where interviewing was not possible due to operational concerns (e.g. Regular soldiers), other data collected was from semi-structured questionnaires. The management at the Army’s Training Technology Centre (TTC) also provided access to confidential documents that outlined the history of the Army’s e-learning project. A total of 101 interviews and 129 questionnaire responses informed the data analysis. I also observed and participated in e-learning classes at an RTC and visited the TTC in Sydney where course production designers and producers were interviewed and work-in-progress was observed.

All the sources of data were compared and analysed using Grounded Theory principles. Four main factors that were influencing e-learning effectiveness were identified and a substantive model grounded in the Army’s experience was developed. The inductive
research approach adopted enabled the research aims of the thesis to be achieved and informed further research.

1.4 Scope of the research

The approach taken in the study was to allow the stakeholders in the organisation to provide the context for understanding the factors influencing e-learning effectiveness. The aim was not to measure or determine e-learning effectiveness in the Army based on predetermined criteria. The study did not focus on the factors influencing the adoption of e-learning. The focus of the data collection was stakeholder perspectives during 2004 to 2005, which was defined by the Army as ‘a consolidation period’ for e-learning (section 4.3.1 provides further details).

The study approach used was to gain an understanding of effectiveness factors from multiple perspectives. Gaining a statistically representative sample of respondents is not an aim in using a Grounded Theory approach. During the main two-year data collection period, it was possible to negotiate access to a wide cross-section of respondents. Respondents were representative of the hierarchical and functional activities relevant to the Army’s e-learning activities. These respondents included senior Army managers involved in e-learning policy development (including a retired Major General), training centre managers, instructional designers, course developers, instructors, and Reservists and Regular soldiers. There were respondents from all of the RTCs across Australia, except one centre, where Army operational concerns at the time prohibited access to staff.

The TTC manager provided access to confidential documents relevant to the history of the Army’s e-learning development. These documents and two retired training managers’ interviews provided insights into the decision-making processes that occurred prior to the start of this study (section 2.4.4). The two-year data collection period allowed respondents to provide valuable longitudinal data on the issues and actions taken in relation to e-learning effectiveness. It was possible to do some repeat interviews one year apart with some managers, instructors, instructional designers and course developers. These follow-up interviews were useful to confirm the issues and actions that informed the data analysis and model development.
To provide a focus for data analysis most of the data collection centred on respondents involved in the e-learning component of the Subject One Corporal (Subject 1 CPL) course. This data collection focus came primarily from discussions with the Army appointed Point of Contact (POC). The Army regards this course as the most important undertaken by every soldier, as it provides the knowledge, skills and attitudes for the first promotion (Ashman & Ellis 2005). The Subject 1 CPL course aims to prepare Corporals to manage a small group of ten to fourteen soldiers. The course contains the command, leadership and management knowledge and skill competencies required for promotion from Private to Corporal, which usually takes place after four years Army experience.

The Subject 1 CPL e-learning component consists of a series of CD-ROM modules in a learning package, which covered the theoretical content, learning activities and formative assessment of the competencies skills required. The CD-ROM modules were delivered to soldiers in classrooms during a two-week residential period of training. It was anticipated that there would be little difficulty in locating respondents, as the course is delivered in all of the major soldier populations in Australia and the e-learning modules have been used since 2000.

The field-based research was limited to a single organisation, but included multiple sites across Australia and a cross-section of respondents across e-learning activities and through the organisational hierarchy. The delimitation of the research aims to study one organisation provided the opportunity for in-depth data for analysis. The Grounded Theory approach adopted enabled the data from multiple sources to be compared and analysed to inform the development of the substantive model.

1.5 Definitions

Some terms used in this thesis have been used inconsistently in the literature as they reflect the pedagogies and technologies that predominate in different education and training contexts. As the study has adopted an inductive approach, the focus was not on providing definitive definitions prior to gaining the respondents’ perspectives. The main terms used in the research questions are defined to clarify their meaning within the context of this thesis.
1.5.1 E-learning

Notions of e-learning in terms of using electronic media to support learning tend to reflect the rapid development and changes in Information and Communication Technologies (ICTs), such as:

- computer assisted instruction, computer-mediated communication (Metz 1994)
- networked learning (Chua, Debreceny & Ellis 1995)
- tele-learning (Collis 1996)
- computer based learning (Schaverien & Cosgrove 1997)
- Web-based education (Barbieri & Mehringer 1997)
- online learning (Alexander & Boud 2001)
- e-learning (Rosenberg 2001)
- Web-based flexible learning (McKavanagh et al. 2002)
- mobile or m-learning (Geddes 2004)
- simulated learning environments or synthetic environments (Stedmon & Stone 2001) and virtual environments (Stonebraker & Hazeltine 2004).

The development and use of e-learning related terms also vary according to the context. For example, training contexts tend to use terms in relation to business concepts, such as e-commerce or e-business (Rosenberg 2001). Workplaces have also adopted more training specific terms, such as technology based training (Dobrovolny 2003), online training (Schmeeckle 2003), Web-based training (Wisher & Olson 2003) and workplace e-learning (Servage 2005). The concept of e-learning in the higher education sector has focused on the collaborative learning aspects made possible through using ICTs (Laurillard 2004; Salmon 2000). E-learning concepts are also incorporated within broader discussions relating to flexible learning (Australian Flexible Learning Framework 2003; Smith, Wakefield & Robertson 2002), distance or distributed learning (Winkler, Leonard & Shanley 2002; Wisher, Sabol & Moses 2002) and mixed delivery modes or blended learning (Bersin & Associates 2003). Therefore, the development and use of terms associated with using electronic media for learning has been influenced predominantly by the changing availability of technologies and the context of implementation.

To make a decision about how to define and use the terms in this thesis, it was important to understand how the Army was defining and applying these terms.
Reflecting the general shift in the training sector, there was an evolution of terms relating to e-learning evident in the Army policy documents, including Technology Based Training (TBT), Computer Based Training (CBT), Computer Based Learning (CBL), e-Learning and Web-Based Learning (WBL). A technological focus was evident in earlier documents: ‘TBT is defined as being the employment of electronic media to deliver, assess and manage learning’ (Headquarters Training Command-Army 2002b, p. 1). Later documents indicate a learning outcomes aim: ‘e-learning is the broad term given to a number of “types” of learning that result when course information, learning resources, instructional modules or ultimately, complete courses are accessible online’ (Headquarters Training Command-Army 2004, p. 3). That is, there was an intention evident in the Army policy documents to shift from a focus on the technologies of e-learning to the learning process. However, the respondents in the study predominantly indicated a technology focus with the terms ‘TBT’, ‘e-learning’ and ‘CBL’ being used interchangeably to describe the CD-ROM module packages. That is, they associated ‘e-learning’ with the CD-ROM modules primarily used as learning tools.

In the draft *Flexible Learning Strategy 2004-2006* (Headquarters Training Command-Army, 2004), e-learning was related to flexible learning concepts to reflect the Australian Flexible Learning Framework (AFLF) principles. There was an aim to provide flexible learning options through the increased use of Internet technologies across the Australian Defence Organisation (ADO). The definition of ‘e-learning’ in the *Defence E-learning Strategy* (cited in Elkington 2002, p. 8) also reflected the AFLF principles: ‘E-learning is explained as anything delivered, enabled or mediated by electronic media to facilitate the right people learning the right information, skills and attitudes at the right time’. However, the work on developing an Army flexible learning policy was postponed, primarily due to technical difficulties associated with inadequate Internet bandwidth availability over the Defence Restricted Network (DRN) (MAJ K McVay 2005, email 31 August). Technical and cultural issues also restricted the move to networked Internet delivery of the Army’s soldier training course, which are discussed further in section 2.4.4.2.

Therefore, despite intentions and some trials to move to flexible and networked e-learning options, the Army continued to provide e-learning courses delivered on CD-ROMs to trainees attending instructor supervised residential classrooms. There are escalating and increasingly complex operational situations that place extra demands on Defence training
requirements. A more recent training focus (after data collection for this study was completed) was on providing ‘a force with increased flexibility, adaptability and agility’ (Department of Defence Australia 2006a). The impact of this focus to provide flexibility and adaptability for soldiers on the design and use of e-learning approaches can be the focus of future research.

Thus, there were differences in how e-learning was defined and discussed within the Army. ‘E-learning’ was adopted for the thesis as a broad concept that covers using electronic media (in this case CD-ROMs) to support learning, while exploring the associated characteristics of the e-learning environment, that is, the characteristics of the place and setting where e-learning occurs. The respondents’ terms are used in reporting quotations to maintain the context of the respondents’ comments.

### 1.5.2 E-learning effectiveness

A dictionary definition of effective is ‘producing a desired or intended result’ (Compact Oxford English Dictionary of Current English 2007). The concept of effectiveness implies that there is an intended outcome related to an activity. That is, the nature of the outcome is subjective, depending on the context of the activity.

Chapter 2 provides a substantial overview of the scope of the contentions associated with the notion of e-learning effectiveness and the wide diversity of assumptions, implications and approaches used to understand e-learning effectiveness. The literature review indicates the pitfalls and contentions in isolating discrete variables to understand e-learning effectiveness factors within the complexity of education and training environments. The literature review also indicates that the selection of criteria to measure or understand e-learning effective factors is not often acknowledged.

To define e-learning effectiveness for this study, it was necessary to have an understanding of how the Army uses this concept. The Army has a structured competency-based approach to assess trainee skills, knowledge and attitudes and undertakes formal processes of feedback and review of the training programs. It conducted controlled experimental trials of e-learning courses from 1996 to 2000, comparing trainee results from traditional face-to-face classroom delivery with outcomes from e-learning courses.
delivered in classrooms. For e-learning courses to be implemented there was a requirement that e-learning course use ‘matched the training effectiveness of traditional classroom instruction if all other training remains equal’ (Headquarters Training Command-Army 2000, p. 29). The reports on the Army’s trials of e-learning courses indicated that overall e-learning ‘could be effectively used in Army training’ with effectiveness defined in terms of trainees achieving the required training competencies. Details and discussion of these trials are provided in section 2.4.4. That is, the Army’s notion of e-learning effectiveness was that it fits its training requirements.

The study provides insight into the factors influencing e-learning effectiveness within the Army training environment from multiple perspectives. The study did not aim to determine effectiveness in terms of measuring learning outcomes or by comparing the e-learning design with pre-determined concepts of effective e-learning. The Army undertakes extensive and regular evaluations of its training and it was not an aim of this study to review or replicate these processes. The study aimed to explore the different experiences and perceptions of e-learning in the Army to understanding how and why e-learning use was working in the organisation, or was not working, for those involved. Taking an exploratory research approach allows the respondents to discuss the factors influencing effectiveness in their terms and from their experiences within the working environment.

1.5.3 Australian Army

The Australian Army is relatively small by international standards. The 2005 Department of Defence annual report indicated that there were 25,356 full-time personnel and 15,845 active Reserve Army personnel employed at the end of June 2005. These figures compare with more than 600,000 soldiers on active duty in the US with a training base capacity of 454,000 seats (US Army 2006). The logistics for organising for the Australian Army training was described as ‘enormous’ in a senior training manager interview for this study. Thus, the Army is a large, dispersed workplace organisation that has training as a core activity.

The Australian Army has traditionally been involved in two types of training, individual and collective. Individual training is co-ordinated and delivered by the Army’s Training
Command, and collective training is co-ordinated and conducted by Land and Logistic Commands involved in field training and assessment. E-learning courses are part of individual training. Individual training was traditionally delivered as face-to-face training through classroom-based residential courses and field based training (Ashman & Ellis 2005).

Although distance learning has not been used recently in any major way in the Army, there is a long history of distance education being provided back as far as 1918, when the Australian Infantry Forces Education Service delivered courses to approximately 185,000 overseas troops (Training Technology Centre-Army 2003, p. 2). While independent, distance learning using e-learning courses was the original intention of the design of e-learning for the Australian Army, the predominant delivery model is residential classroom based delivery (Headquarters Training Command-Army 2004). Thus, e-learning courses are embedded in Army residential individual training programs.

1.6 Ethical and support considerations

This study was the collective product of my research interests, the Army’s interest in investigating e-learning effectiveness, the university’s requirements for doctoral research and the Army’s operational and security requirements. It was supported by a three-year Australian Postgraduate Association- Industry (equivalent) scholarship, the provision of an Army Headquarters Training Command funding to cover research expenses, two Internal Research Grants from SCU and assistance from the Asia Pacific Information and Communications Technologies (ICT) Enterprise Development and Research Institute. Although this was partially externally funded research, the relationship with the Army was informal and not on contract, and all intellectual property is retained by the university.

Ethics approval was granted under the SCU Ethics Committee process (Approval Number ECN-04-13 6.4.04). This approval covered the interview and questionnaire protocols, the introductory letter and information sheet outlining the purpose of the study, and respondents’ roles and rights, including their right to withdraw, anonymity and confidentiality. The university Ethics Committee asked if the Army required ethics clearance. Upon request and submission of an outline of the aims of the study and types of questions, the official response was that no Army ethics approval was required and that
the study had approval of the Head of Training Command to be administered through the TTC (LT COL A Greenberry 2004, email 29 April).

1.7 Outline of the chapters

Figure 1.1 indicates the thesis structure in relation to the aims of the research. The chapter presentation reflects the inductive approach of the thesis development.

![Chapter Diagram]

Figure 1.1 Overview of chapter structure used in this thesis

**Chapter 2 E-learning effective research**

The scene for this thesis is set by an overview of how e-learning effectiveness is being discussed in the research literature. The socio-economic external drivers for organisations to adopt e-learning are examined, particularly in relation to e-learning uptakes in the Australian Vocational and Education (VET) sector. Contentions in the conceptualisation of e-learning effectiveness are discussed. E-learning effectiveness in the military sector is examined including a summary of the Australian Army’s e-learning projects prior to the commencement of this study in 2004.

**Chapter 3 Research approach**

Chapter 3 details the justifications for selecting a Grounded Theory (Glaser & Strauss 1967) research approach in relation to the research aims. The research methods used to collect and analyse the data to answer the research questions are detailed.
Chapters 4 to 7  Data analysis presentation
Four chapters (Chapters 4 to 7) present the data analysis from the research. These four chapters assist in answering the first research question - What are the factors influencing e-learning effectiveness in the Australian Army? These four chapters each represent one of the main factors: organisational priorities, learning environment, instructor’s role and learners’ needs. The analytical processes used in the research are summarised and illustrated with examples from the organisational priorities factor at the beginning of Chapter 4. The results of the data analysis are presented in terms of main concepts that emerged from the respondents’ concerns. Each of these chapters provides a set of recommendations based on the analysis and discusses the main concepts that informed the theoretical development of a substantive model.

Chapter 8  An Integrated E-learning Culture Model
Chapter 8 presents a model for developing an integrated e-learning culture, which was developed from the analysis of the main factors and concepts emerging from the concerns of the respondents in the Army research. This model answers the second research question - How does this understanding of influences inform the development of a model of factors influencing e-learning effectiveness in large, dispersed workplaces? Comparison of this model with some empirical research from the literature of e-learning use in large, dispersed workplaces adds relevance and improves validity of the model outside the Australian Army context.

Chapter 9  A proposed E-learning Comparative Alignment Framework
This chapter extends the original aims of the research by developing a proposed framework that can be used by researchers and practitioners in further e-learning effectiveness research. Possible uses of this framework are suggested with illustrations. Theories of alignment are located in relevant theoretical literature to understand the broader relevance of the main concept underlying the model and the framework. Suggestions for further theoretical research are provided.

Chapter 10  Conclusions and recommendations
The thesis is summarised in terms of the research aims, its practical and theoretical significance and other issues requiring further research.

1.8 Conclusions
This chapter provides an orientation to the research presented in the study. The background to the study that informed the development of the research aims is outlined.
The research approach that was selected to achieve these aims is briefly justified in terms of the inductive nature of the research aims. The use of data and literature in this study in relation to the inductive approach is indicated. The scope of the research, including the delimitations of the research, assists in providing a focus for the research. Key terms, included in the research aims, are explained within the context of this research. The inductive research approach adopted, which is reflected in the presentation of the chapters, is also outlined. On these foundations, the thesis can proceed with an overview of the e-learning effectiveness literature.
Chapter 2  E-learning effectiveness literature overview

2.1 Introduction

This chapter provides an overview of how e-learning effectiveness has been discussed and examined in the literature. The aim is not to determine whether e-learning is effective or to summarise research findings about effectiveness outcomes. An examination of the socio-economic influences on e-learning use in Australia informs an analysis of the economic, technological and pedagogical constructs of e-learning effectiveness. A discussion of the differences between higher education and workplace contexts highlights the contentions in discourse about e-learning effectiveness. An overview of the Australian Army’s e-learning activities and evaluation studies prior to the start of this study provides a context for the study. The review approach provides an understanding of the place and context of this thesis in the relevant substantive literature.

Therefore, this chapter:

- provides the literature review position in relation to the Grounded Theory approach adopted for this research (2.1)
- summarises the socio-economic influences on e-learning adoption in Australian education and training and the resulting scope and trends of e-learning use in the Australian VET sector (2.2)
- presents contentions in the conceptualisation of e-learning effectiveness in the research literature (2.3)
- examines the issues presented in the workplace-based e-learning literature, including the military sector, and provides a summary of the development of the Australian Army e-learning projects up to the commencement of this study in 2004 (2.4)
- provides a conclusion to the chapter (2.5).

2.1.1 Literature review approach

As outlined in Chapter 1, an inductive Grounded Theory approach (Glaser 1978, 1992, 1998, 2001, 2004; Glaser & Strauss 1967) was selected as appropriate for this research study. Thus, the background literature discussed in this chapter was not used to generate
hypotheses to test and it did not drive the data collection, research procedures or analysis. However, as Glaser (2001) argues, the background literature or ‘technical literature’ can assist the researcher’s sensitivity to the kinds of variables that relate to the area of research. That is, this review provided an awareness of the e-learning research that improved sensitivity to the incidents presented in the data. As the main concerns for the respondents emerged, and the relationships between the variables became evident, other relevant literature was located, which contributed to the analysis and development of the models presented in Chapters 8 and 9.

Determining the delimiters for this literature review required consideration of the context of this study. There is considerable research published, especially over the last ten years in the higher education sector, on designing, implementing and evaluating e-learning. The Australian Army is a large public service workplace within the VET sector where there is much less publicly available research on e-learning. While education sector research can inform research into e-learning effectiveness in workplaces, there is also a need for awareness of the impact of the diversity of organisational contexts. As this is the first external research into the Australian Army’s e-learning, it was necessary to locate other sources of literature to compare and determine the relevance of the study. The review also informed the position taken in this thesis that there is a need for grounded empirical research to inform theoretical development in this area.

This overview of the literature aimed to:

- identify the influences on e-learning effectiveness research in education and training
- identify the scope and trends in the research on e-learning effectiveness in the VET sector, particularly in Australia
- identify the scope and trends in the research on e-learning effectiveness in non-corporate settings, including the overseas Australian military
- highlight the trends and gaps in the research literature to assist in determining the place and significance of this study.

The literature cited in this chapter is the result of a wide range of database and Web site searches for research-based documents relating to e-learning effectiveness in Australia and overseas. The sources included:
• international and Australian databases that were available through SCU library including Proquest, ERIC, ISI Web of Knowledge, Emerald, Expanded Academic Index, Australian Public Affairs Information Service and the Australian Education Index
• Australian VET research organisations Web sites, such as the National Centre for Vocational Education Research (NCVER) database VOCED, the NCVER Website and the Australian Flexible Learning Framework (AFLF) website
• specific data Web sites, such as the Australian Bureau of Statistics
• Defence specific Web sites, such the Australian Army, the Australian Department of Defence and the US Army Research Institute for the Behavioral and Social Sciences
• further Web and database searches to locate specific papers and to follow-up relevant references
• unpublished Australian Army reports provided by the TTC for this study.

2.2 Background to the study

The background into factors influencing e-learning adoption in Australian workplaces provides a context for research into the Army’s e-learning projects and provides a context for discussing e-learning effectiveness factors. In an overview of international e-learning trends, the Department of Education, Science and Training, Australia (DEST) recognises the diversity of contexts of e-learning adoption in each country and the influences of culture. ‘Policy for ICT in education is influenced by the socio-economic context of the country, the history and traditions of its education system, and by a range of government and cultural influences’ (Kearns 2002, p. 3).

The Department of Defence recognises socio-economic trends as influences on recruitment, training capacity and resource planning (Schindlmayr & Ong 2003). These influences include the rise of terrorism, continuing economic growth, the ageing population, low unemployment, low population growth, rising divorce rates and rising higher education qualifications attainment. External socio-economic factors also influence workplace organisations plans to adopt training innovations, such as e-learning.
2.2.1 The information economy

Australia’s participation in international affairs has influenced education and training government policies, including the investment in flexible learning projects. There has been a shift over the last two hundred years from industrial-based economies that relied on labour and capital to form wealth to the ‘new economies’ based on developing a competitive edge in the accessing and distribution of information. The increasing availability of cheaper and faster networked technologies, particularly with the diffusion of the Internet over the last twenty years and cheaper computer hardware, has allowed more individuals and organisations to participate in exchanging information and knowledge globally. In particular, government policies have promoted improved access to Internet technologies and computers as providing inherent benefits for workers, such as upgrading information technology skills, providing more flexible learning and life-long learning opportunities (Advisory Council on Science and Technology 1999; Progressive Policy Institute 2002; The Scottish Office 1999; US Department of Commerce 2000).

The implications of the push in Western countries for workplaces to participate in the information economy have challenged the way many people and organisations carry out their work. The promotion of a more flexible workforce has been a feature of government policies in Australia since the development of the National Training Reform in the 1980s and early 1990s (Burns 1995, pp. 32-4). Providing workers with improved access to a range of learning opportunities, such as distance learning, was also encouraged at this time (Flexible Delivery Working Party 1992). The announcement of a Department of Defence efficiency review and the subsequent restructuring of the Army’s training reflected this push for training reform ‘to make the Army more responsive, more mobile, better trained and better equipped to handle a range of military contingencies’ (Department of Defence Australia 1996a; 1996b, e.p.).

In response to the need to formalise the Australian government’s participation in the move to an information economy, the Federal Government established the National Office for the Information Economy (NOIE) in 1997 (which is now the Australian Government Information Management Office) with a broad agenda:

1 e.p electronic publication. This term is used to indicate an electronic publication where page numbers were not available to quote in the citation.
• establishing the regulatory, legal and physical infrastructure environment for online activities
• facilitating electronic commerce
• ensuring a consistent Commonwealth position in international fora
• overseeing policies for applying new technology to government administration and information and service provision (National Office for the Information Economy 2004, e.p).

The height of the information economy focus was around 1999. Western governments responded to the emerging global information-based economy with policies that focused on encouraging citizen’s participation and the development of business competitive positions. Examples are the OECD (1999), the UK (The Scottish Office 1999), Canada (Advisory Council on Science and Technology 1999), and the US (US Dept of Commerce 2000). The goals of these policies were similar in terms of encouraging economic growth and competition through investment in Internet infrastructure and computer technology.

The national government policies provided a strong push towards a technological driven economy, in which the standard of living and economic growth are dependent on access to computer networks and technology to gain information for production and to create jobs. The same perspective was also evident in government department policies. For example, an Australian Department of Defence (2000, p. xvi) policy highlighted the necessity of ‘providing informed choices in the selection of technology and its applications. This will be critical if Australia is to retain its “knowledge edge” and if we are to invest wisely in future capability’.

A result of this push towards the information economy was the publication of reports that measured outcomes of structural changes achieved in both the economy and society. For example, the US Progressive Policy Institute (2002) published a series of reports from 1998 to 2002 showing the states’ relative achievement including ‘knowledge jobs’ created and measures of the ‘digital economy’, such as the usage rates of the Internet in the general population, industry, schools and government. Similarly, NOIE’s annual reports included qualitative and quantitative measures of the development and progress of Australia’s ‘Participation in the Information Economy’ including the use of information technologies in business, government and social sectors, such as education, health and
defence (National Office for the Information Economy 2004, e.p). Therefore, by early 2000, competitive political and economic forces were driving e-learning uptake and uptake levels were being measured in terms of technology implementation.

### 2.2.2 Flexible learning policy in Australia

The establishment of the AFLF in 2000 and the publication of the *Flexible Learning for the Information Economy* policy from the Australian National Training Authority (ANTA) (2000) supported the use of technologies in education and training. The ANTA policy proposed that new workforce skills were needed to use information technologies to replace ‘the old industrial mass-production approaches to teaching and learning’ and to implement more ‘convenient and customised products and services’ (p. 4). The concept of flexibility in national VET policies further evolved towards providing workers with improved access to a wider range of learning options. ANTA described these options in terms of improved access to learning opportunities ‘where, when and how they want it…on-the-job, off-the-job or anything in between, provided any time of the day or night, over 365 days of the year, on-line and offline, self-paced or classroom’ (Australian National Training Authority 2001, p. 6).

Implementing flexible learning implied significant changes to training and organisational priorities. The promotion of flexible learning in government policies implied an organisational change involving a shift in teaching and learning relationships. The push to implement e-learning to provide more flexible learning opportunities came with the promotion of the potential for greater learner control of learning with the instructor playing a facilitator role (Australian National Training Authority 2001). However, there was also some concern that the rapid implementation of e-learning in the VET sector occurred without adequate research into underlying learning principles (Schofield, Walsh & Melville 2000).

In 2000, the Australian Institute of Training and Development argued that the ‘effective and flexible’ approaches to vocational, operational and management training were underutilised in the Australia/NZ region (Van Buren & King 2000, p. 16). Some features of the Australian workforce that were considered drivers for using information technologies included geographically dispersed employees, time constraints, rapid response requirements and the relatively smaller size of organisations in the region (60%
employed less than 500 people) compared with the US (39% employed less than 500 people). For example, the Australian Department of Defence with its large and mostly mobile, dispersed population of part-time and full-time members requires ‘consistent, comprehensive and intensive pre-employment and continual career training and preparation’ (Jorgensen 2004, p.11). Therefore, providing Australian workers with access to e-learning was viewed as a way to provide geographically dispersed workers with standardised training to meet changing business needs and to achieve national strategic goals.

The focus of the Australian Flexible Learning Framework (AFLF) was to develop infrastructure and skills in the VET sector, which includes the Technical and Further Education (TAFE) college system and workplace training. In 1995, the Australian Qualifications Framework (AQF) was developed from this reform. The AQF provides a unified system of national qualifications in schools, vocational education and training (TAFEs and private providers) and the higher education sector (mainly universities). In 2002, the Australian National Training Authority (ANTA) established the Australian Quality Training Framework (n.d.) as a basis for providing a nationally consistent VET system setting the standards for a system of accrediting RTOs including educational institutions, workplaces and private providers. Workplaces, such as the Australian Army, have satisfied the requirements of being an RTO (Jorgensen 2004).

2.2.2.1 Defence flexible learning

Organisations, including the Department of Defence, gradually aligned their training programs and outcomes to the AQF where appropriate. This process was valued as providing as a recruitment incentive, to retain staff and to develop ‘more effective industry partnerships’ (Department of Defence Australia 2000, p. 68). There were also advantages of providing civilian recognised training that takes place at no cost to employers and the transferability of employee competencies listed on a national online database. Reserve soldier recruitment emphasised the transferability of skills through the AQF.

The Department of Defence has demonstrated support for the National Training Framework by structuring its programs and related experience to facilitate recognition of programs as ‘accredited courses’ as much as possible (Jorgensen 2004). In 2004 to 2005, the Department of Defence offered 352 nationally recognised qualifications ranging from
Certificate II to Advanced Diplomas from 23 national training packages, and a further 364 nationally recognised ‘accredited course’ qualifications (Department of Defence Australia 2005, e.p). However, depending on the skills and knowledge required not all training in all workplaces can be aligned with the AQF. This is particularly the case with workplaces that require specialised skills. For example, the unique aspects of defence employment, especially warfighting, ‘dictates that Defence conduct much of its own education and training and that it has a defined consistency of outcomes’ (Jorgensen 2004, p. 11). Therefore, the Army participates in mainstream Australian VET sector alignment processes and activities and provides specialised training.

Central government policies have encouraged a competitive push for the adoption of e-learning in government departments, educational institutions and commercial corporations. For example, national e-learning projects were developed in the education sector in Australia (Department of Education Science and Training Australia 2000) and in the UK (Department for Education and Skills UK 2003). Some public sector organisations also developed e-learning strategies, including the UK Defence eLearning Strategy and the Australian Defence Organisation (ADO) Defence E-learning Strategy (cited in Elkington 2002).

The ADO undertook to deliver common standards for a whole-of-Defence e-learning system. Various achievements relating to Web technology implementation for administration and e-learning activities were outlined in the Department of Defence Annual Report (2005). These activities included the implementation of a Learning Management System (LMS) and the delivery of a large number of courses over the Defence Restricted Network (DRN). ‘Since 1 March 2004, all Defence employees have been able to access the Defence Online Management and Information Network (DOMAIN) that now offers over 40 courses…with over 80,000 enrolments and over 46,000 course completions’ (Department of Defence Australia 2005, e.p). Publicity reports indicated that DOMAIN cost $3 million and was ‘one of the largest e-learning projects ever undertaken in Australia’ (Mills 2005, e.p). However, the problems encountered in rapidly implementing this system indicated to the Department of Defence that they should have taken longer to plan the launch (Mills 2005).
2.2.2.2 E-learning hype

Dobbs (2001, e.p) proposed that the emergence of the new information economy encouraged investment in Internet technologies and motivated organisations to rush to get online ‘regardless of whether they had a clear reason to do so…Nobody seemed to quite understand what was happening, but no one dared to get left behind’. Reflecting on the gap between implementation and knowledge of e-learning, Hase and Ellis (2001) argue that the implementation of new practices frequently outpaces our understanding of how a particular practice really works. They provide the example of the move in Australia to print-based distance learning in the early 1970s and argue that knowledge of educational design principles that underpin learning at a distance, and associated concepts of self-paced learning, learner-centred learning and learner-managed learning only started to mature during the 1990s. Thus, there was likely to be a delay between the push to develop e-learning infrastructure and understanding of how flexible learning, including e-learning would benefit education and training.

A result of the information economy hype was investment in large-scale higher education e-learning projects during 2000 to 2003, such as the Global University Alliance, Universitas 21, the UK eUniversities (UKeU) project and private e-learning corporations, such as Worldwide Learning (Jokivirta 2006). However, many of these large e-university projects encountered difficulties or collapsed during 2005 and 2006. There were reports of problems with conflicts between the priorities of commercial suppliers and university managements and a lack of understanding of learners’ and academic needs (Slater 2006). There are also some examples of e-learning being used successfully in large organisations (Ettinger & Holton 2004) and some reports of successful independent eUniversities. Slater’s (2006, p. 4) review of the collapse of the UKeU project indicated that the ‘very few’ successful independent e-university ventures were focused on satisfying the needs of specialised groups of learners. As government policy and financial support for wide scale e-learning infrastructure has been a relatively recent development, the impact of the information economy agenda on teaching and learning is only in its infancy.

Therefore, a prime motivation for the adoption of e-learning came from organisations responding to the promise of new economic opportunities provided by Internet technologies. There was a focus on providing ICT infrastructure to transform and support business outcomes, particularly e-commerce. The anticipated transformative push that
came with the information economy agenda has been a major influence in defining e-
learning use in terms of the uptake of ICTs. However, the reality of the experience of
using e-learning has not always matched anticipated outcomes.

2.2.3 E-readiness in Australia

The development of the role of e-learning in workplaces due to this economic push needs
further research. The impact of these economic and technical drivers on the uptake of e-
learning in Australian workplaces was difficult to determine due to the lack of consistent
national data collection. As an indicator of Australia’s participation in the information
economy, DEST (2004) provided the details in Figure 2.1 of Australia’s e-readiness
international ranking by the Economist Intelligence Unit (EIU).

<table>
<thead>
<tr>
<th>E-readiness ranking</th>
<th>Country</th>
<th>E-readiness score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sweden</td>
<td>8.67</td>
</tr>
<tr>
<td>2</td>
<td>Denmark</td>
<td>8.45</td>
</tr>
<tr>
<td>3 (tied)</td>
<td>Netherlands, US, UK</td>
<td>8.43</td>
</tr>
<tr>
<td>6</td>
<td>Finland</td>
<td>8.38</td>
</tr>
<tr>
<td>7</td>
<td>Norway</td>
<td>8.28</td>
</tr>
<tr>
<td>8</td>
<td>Switzerland</td>
<td>8.26</td>
</tr>
<tr>
<td>9</td>
<td>Australia</td>
<td>8.25</td>
</tr>
<tr>
<td>10 (tied)</td>
<td>Canada, Hong Kong</td>
<td>8.20</td>
</tr>
</tbody>
</table>

Figure 2.1 Australia’s e-readiness ranking 2003 (based on Economist Intelligence Unit, cited in
Department of Education Science and Training. Australia 2004, p. 47)

While this ranking has a business focus: ‘A country’s e-readiness is essentially a measure
of its e-business environment, a collection of factors that indicate how amenable a market
is to Internet-based opportunities’ (Department of Education Science and Training.
Australia 2004, p. 42), Australia low e-readiness ranking indicates that there were likely to
be issues for e-learning use in workplaces (Figure 2.2).

Connectivity for was also comparatively low in Australia in relation to the leaders in this
ranking (Economist Intelligence Unit 2003) (Figure 2.2), which suggests issues for e-
learning use. Figure 2.2 also indicates that there is a range of social, economic, legal and
technical variables considered by the EIU as influences on the use of ICTs.
DEST’s research (2004, pp. 47-8) also detailed limiting factors in Australia to e-learning development take-up and effectiveness, including inadequate bandwidth combined with distance and the high cost of communications. In particular, the problems with infrastructure were ‘denying students and teachers with the full range of possibilities of e-learning and eroded confidence in reliability of networks and reduced the establishment of networks of people and organisations’.

The VET sector had benefited from the AFLF’s efforts to provide a centralised approach to support for e-learning development through ‘a nationally consistent approach to VET training packages, professional development and the provision of high quality e-learning tools for trainers’ (Department of Education Science and Training 2004, p. 49). However, despite this support there were problems in developing networked infrastructure to support e-learning in Australia in all education and training sectors. Limiting factors for e-learning uptake in industry training were described by DEST as ‘complex’ and included remoteness, bandwidth, teacher confidence and access to professional development (p. 49).

To reduce problems associated with inadequate bandwidth, in order to improve equity in access to e-learning in rural and remote areas, Telstra suggested that multiple government service providers (such as health, education, emergency services and/or defence) ‘support the creation of shared infrastructure that is wholesaled to service providers’ (Department of Education Science and Training 2004, p.72). That is, there was an expectation that public service agencies had access to broadband networks. However, there is evidence that the Department of Defence had problems with limited bandwidth availability on the
Defence Restricted Network (DRN) that delayed the full expectations of high-end multimedia Web-based course delivery through the DOMAIN network (Deare 2004). Thus, the Army is a large government organisation that is required to address external demands while meeting internal requirements for improved technological access and training efficiencies using e-learning.

2.2.4 E-learning uptake in Australia

Despite reports of large investments in e-learning infrastructure, the impact of ICT investments on e-learning uptake in workplaces in Australia is difficult to determine due to the lack of consistent national surveys. While some overseas organisations provide regular, freely available reports on the uptake of e-learning in education and training sectors, these are generally not comprehensive national surveys and they are based on a limited sample of respondents. Within the limits of the data collection methods, these surveys do provide some useful insights into e-learning uptake and trends, for example, in the US higher education sector (The Sloan Consortium 2005) and in training (American Society for Training & Development 2006; ASTD/The MASIE Center 2001; Brandon-Hall Research 2006). However, the differences between the uptake and effective use of e-learning are highlighted in a US survey (ASTD/The MASIE Center 2001, p. 1): ‘Most trainers and managers inherently know that just making e-learning technology available will have no significant effect on employee development or workforce productivity’. Thus, measures of the uptake of e-learning courses or technologies do not necessarily indicate effective use.

The international studies indicate a range of e-learning design models being used in workplaces, with e-learning delivery predominantly playing a role within blended learning methods. A survey by the American Society for Training and Development (ASTD) of e-learning in UK workplaces indicated that the organisations surveyed predominantly (73%) used stand-alone CD-ROMs for e-learning content with Web-based discussions being used by about 18 percent of the respondents and a predominant use of blended modes of learning (83%) (Sloman 2004, e.p). A survey of European e-learning organisations also indicated considerable diversity across the countries. Considerable training time was spent in classroom instruction (23% to 78%), while blended learning methods took more training time (9% to 25%) than ‘pure’ e-learning (3% to 14%) (Massy, Harrison & Ward 2002, e.p). Overall, the trends for workplace training indicate slower uptake of e-learning
than expected, higher than expected attrition rates in e-learning courses and the predominant use of blended learning approaches.

As these publicly available surveys usually only included a very small number of respondents from the military, it was difficult to ascertain uptake in the military sector. However, a US survey (e-learning Magazine 2001, e.p) included respondents from government/military (20%), corporations (53%) and higher education (12%) sectors. While this survey provided pre-determined answers to respondents, it indicates some trends across three sectors in terms of the major benefits and challenges to e-learning use (Figures 2.3 and 2.4). These percentages indicate that for the three sectors there were similar benefits and barriers. The government/military sector valued self-paced learning and cultural resistance and lack of bandwidth were the main barriers for e-learning use.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Government/military</th>
<th>Corporation / company</th>
<th>Higher education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available anytime anywhere</td>
<td>75%</td>
<td>80%</td>
<td>82%</td>
</tr>
<tr>
<td>Allows for self-paced learning</td>
<td>75%</td>
<td>57%</td>
<td>45%</td>
</tr>
<tr>
<td>Cost savings</td>
<td>57%</td>
<td>65%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Figure 2.3 Comparison of the top three *benefits* of e-learning across the US education and training sectors, including Government/military (based on e-learning Magazine 2001, e.p)

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Government/military</th>
<th>Corporation / company</th>
<th>Higher education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural resistance</td>
<td>71%</td>
<td>42%</td>
<td>63%</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>64%</td>
<td>58%</td>
<td>44%</td>
</tr>
<tr>
<td>Lack of interaction</td>
<td>42%</td>
<td>42%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Figure 2.4 Comparison of the top three *challenges* to e-learning use across the US education and training sectors, including Government/military (based on e-learning Magazine 2001, e.p)

A result of the Australian government’s support for flexible learning was reporting of substantial investments in e-learning infrastructure, including software, technologies and professional development of teachers. ANTA’s (2001, p. 9) planned annual spending on e-learning for 2002 included:

- $7.2 million for ‘World class online content development, applications and services’
- $3.5 million for ‘Supportive technological infrastructure’
- $4.8 million for ‘Learnscope project for work-based learning projects for VET staff’.
The lack of information about Australian e-learning implementation in workplaces was also noted by the AFLF in a discussion paper of emerging issues in e-learning for the VET sector (Eklund, Kay & Lynch 2003). Surveys of e-learning uptake in Australian workplaces were undertaken, in which companies or individual members of training organisations were invited to participate, however, early reports of training delivered using learning technologies in Australia have varied considerably. These figures ranged from four percent in 2000 (Van Buren & King 2000), to nine percent of companies using e-learning that was not instructor led in 2001 (Appcon 2001, p. 9) and to 65 percent of companies delivering at least some of their training online in 2001 (Williams & Whyte 2001, e.p). Private organisations have also carried out surveys of e-learning use in Australian businesses, but due to the commercial potential of this information recent survey results are becoming very expensive (prohibitive for non-commercial researchers) to obtain.

The Australian Bureau of Statistics (ABS) collection of data on the use of e-learning was very limited. Data on householders’ use of computers and the Internet was collected as a supplement to the monthly Labour Force Survey (2005b) during 2004-2005. Twelve percent of adults aged 18 years and over used the Internet for ‘Education/Study’ and 20 percent for ‘Work/Business’ but no definitions were provided for these activities. Of interest to this study was that members of the full-time defence forces were excluded from the ABS survey of Labour Force Information Technology household use (2005b, p. 34). The ABS undertakes an annual survey Business Use of Information Technology. The latest available edition (2005a) indicated a slow increase in computer and Internet use and Web presence over the last few years after a faster adoption rate up to 2001. However, the ABS survey focused on e-commerce uses of the Internet in business and no data was collected on the use of technology for training.

The ABS also published Government Technology, Australia (Australian Bureau of Statistics 2004, e.p), which provides information about Internet and computer use in government departments focusing on infrastructure expenditure for internal departmental administrative uses. This publication does not include information about specific departments or the use of technology for training. Some specific data was available from the Department of Defence Annual Report (2005, e.p), which indicated the utilisation of e-
learning courses. From 2004 to 2005, there had been 26,210 students who undertook mandatory training (including equity and diversity, fraud and ethics and occupational health and safety) using the Defence e-learning courses, involving a total of 7,863 student days. However, administrative staff members were predominately undertaking these Defence courses, rather than personnel involved in operational activities.

Thus, despite the hype about implementing ICT infrastructure and some considerable expenditure, government reports indicate that there is not a clear indication of the overall extent of uptake or use of e-learning in workplaces. There are also indications that there are ongoing technical, political, social and cultural issues that are influencing the uptake and use of e-learning.

2.2.5 Diversity within the Australian VET sector

National empirical research studies carried out for ANTA by NCVER and the AFLF provided background into e-learning uptake and trends in the Australian VET sector (Bate, Robertson & Smart 2003; Brennan et al. 2003; Brennan, McFadden & Law 2001; Cashion & Palmieri 2002; Harper et al. 2000; I & J Management Services 2005b; McKavanagh et al. 2002; Schofield, Walsh & Melville 2000). This research indicates the need to understand the diversity within the VET sector and in particular, the gaps in research about workplace e-learning. These reports also highlight the difficulties in researching across a diverse VET sector. Harper et al. (2000) viewed this diverse context positively as potentially supporting innovative processes and the development of the variety of e-learning models. Thus, the diversity of teaching and learning contexts within the VET sector needs to inform research.

The ABS (2003) Employer Training Expenditure and Practices figures highlighted the need to understand the diverse nature of workplace training (Figure 2.5). Larger organisations provided the majority of their training as structured on-the-job training and most larger workplaces that were providing structured training used some form of ‘computer-assisted structured training’ (Figure 2.5).
The ABS (2003) also indicated that while the majority of employers provided unstructured training rather than structured training, more employers in the public sector provided structured training than in the private sector. Government administration and Defence employers had the highest levels of structured training provision. In the provision of structured training in workplaces, TAFE institutes accounted for 36 percent of vocational training and universities provided 14 percent, leaving a range of private providers and industry providers to deliver the majority. The Army is an example of a large workplace providing structured training using industry providers.

Hill et al. (2003) highlighted a range of issues for researchers within the diversity of the VET sector, including the range of definitions of ‘online learning’ and ‘online delivery’, differences in enrolment data collection across institutions and states and categorising cross-industry content that did not fit ‘standard ANTA industry groups’ (p. 47). They found from the literature review that ‘online delivery’ was most often defined in terms of the technology used (usually the Internet), whereas ‘online learning’ was more contentious. Technology-based concepts were often included in ‘online learning’ definitions but also included the ‘application of good pedagogical practices’ (Hill et al. 2003, p. 17). Therefore, the diversity of e-learning definitions and a lack of identification of different e-learning models used in the VET sector were issues for researchers.

A recently AFLF commissioned report provided the results of a national e-learning VET benchmarking project (I & J Management Services 2005a). It was claimed that this research for ‘the first time demonstrate(d) the level of uptake and use of e-learning in...
Australia’s VET system’ (p. 1). However, the results were influenced by the difficulties in researching within the diversity of the VET sector. While this report provides some overall trends in implementation and satisfaction with e-learning in VET, the findings were skewed towards the TAFE part of VET. The authors defended this imbalance since TAFE represented ‘at least 70 percent of total accredited VET activity’ (p. 18). However, only 6 percent of students and 7 percent of teachers or trainer respondents were from outside TAFE (p. 30). As the results were combined for all respondents within these stakeholder groups, it is not possible to draw conclusions about the use of e-learning in workplaces from the students or teachers replies. The limitations of this report highlighted the difficulties in collecting national data from a broad range of stakeholders across a very diverse VET sector with different definitions and uses of e-learning methods.

The NCVER and the AFLF have carried out nationally based research into e-learning practices and trends in Australia, particularly since 2000. However, these reports tend to focus on the formal TAFE component of VET rather than private or workplace providers. RTOs include the formal VET providers of TAFE, Adult and Community Education, schools offering accredited courses and private, commercial and industry providers. Consequently, the available research tends to focus on structured training that falls within the AQF accreditation guidelines and does not include other training offered by workplaces that could be delivered by e-learning.

There is a gap in the research in understanding the influences on the use of e-learning in workplaces, particularly in the public sector in Australia. The diversity of definitions of e-learning, the e-learning delivery methods and the range of organisations across the VET sector contribute to difficulties in understanding the scope of overall e-learning use. Furthermore, the review indicates that to understand the influences on e-learning effectiveness in an organisation requires an understanding of the definitions and e-learning models adopted and the context of e-learning use. The research approach adopted for this study allows the respondents’ perceptions of e-learning within the Army context to emerge.

2.3 Overview of e-learning effectiveness literature

To place this research within the context of the existing knowledge, it was necessary to understand how e-learning effectiveness has been conceptualised and examined in the
literature. This literature review also provides background for understanding the factors emerging from the field data analysis. This section provides an exploration of the context of research relating to e-learning effectiveness in education and training sectors. The aim was not to develop a theoretical framework or to provide an exhaustive list of references. Rather, the questions asked of the literature were:

- How is e-learning effectiveness being discussed and examined in the research literature?
- What are the scope and trends in the research on e-learning effectiveness in the VET sector, particularly in Australia?
- What are the trends and gaps in the research literature that assist in determining the place and significance of this research?

### 2.3.1 Review strategy

The search strategy for this section focused on combining the subject word ‘e-learning’ with the keyword ‘effectiveness’ in database searches. Various synonyms for e-learning were also included in the subject searches, such as online learning, computer assisted instruction, educational technologies, computer-based training and computer uses in education. Where the database was not VET focused other descriptors were used, including ‘vocational’, ‘training’ and ‘workplace’. Where possible, the database subject thesaurus was used to locate relevant terms. While I recognised that some studies indexed under ‘evaluation’ could have been missed, the focus was on locating papers that were discussing ‘effectiveness’. However, papers discussing evaluation were also included in the results of these searches and were considered in order to gain an understanding of how these two concepts were being discussed.

Research from the higher education sector was also included in the review to gain an understanding of the influence of context in this research. Where it was possible, searches were also limited to peer-reviewed or academic papers to indicate the scope of research-based findings. This literature search located literature from 1996 with a focus on 2000 onwards when e-learning projects had rapidly increased and organisations had some experience in using the Internet and other e-learning technologies. As most of this literature review occurred in the earlier stages of the study the literature reviewed is predominantly published from 2000 to 2005. The international databases were both
restricted, and not restricted to, Australian sources to gain an overall perspective of how e-learning effectiveness was being discussed. Papers from the Australian VET sector and any papers with a military focus were identified and included in the discussion. A separate section relating to military research is included to highlight how this thesis fits within the context of that specific literature (section 2.4.1).

These literature searches returned hundreds of papers covering a broad range of issues and approaches to addressing e-learning effectiveness. They included studies of comparative media learning outcomes, comparative costs of delivery methods, return on investment of e-learning projects, measurements of pedagogical successes, measurements of technological uses, discussions of effective pedagogical methods, and discussions of effective uses of technologies. Therefore, the wide range of variables, concepts and methodologies used has influenced the assertions of the best ways to measure and achieve e-learning effectiveness. The variables included within these studies predominantly reflected those whom e-learning was intended to benefit, whether organisations, policy makers, instructional designers, technical support, teachers or students.

2.3.1.1 Overview of contexts

Much of the available literature, particularly from the non-database sources, was based on anecdotal accounts. Most were from managers of corporations or from commercially based research companies, with a US bias. These articles generally provided accounts of success stories intended to promote a company or providers of commercial e-learning services with unreflective accounts about the transformational aspects of using technology. Reporting from knowledge-based industries, where computers are integral to business has also created a bias in the workplace based e-learning case study literature.

Case studies from the Australian corporate sector do emerge in the research literature but they are few in number and limited in detail. Schofield (2003) highlighted the need for more research-based exploratory studies into the thinking that lies behind the process of adopting and developing e-learning in workplace organisations. As indicated in section 2.2.5, there was a good range of research projects on e-learning developments in Australian VET carried out by bodies associated with ANTA, including the NCVER and the AFLF.
Research into the Australian government sector uses of e-learning was not readily available. Some brief anecdotal accounts were available through Web sites published by organisations involved in designing or promoting e-learning projects, for example from the Australian Defence Department (Bushell 2004; Doubleday & Brown 2003; Doubleday & Keating 2003; Impart 2005a), the South Australian Police (Australian Flexible Learning Framework 2004b), the Australian Taxation Office (Impart 2005b) and the NSW Ambulance (Australian Flexible Learning Framework 2004a). However, these tended to be short descriptive summaries of the projects undertaken, rather than providing critical reflection on experiences of the issues and processes involved.

While this literature review attempted to locate examples of e-learning implementation in different military sectors, the overwhelmingly predominant source of publicly available literature was from the US military. Three military-based research papers from Europe were located and included in this review from the Netherlands (Jansen et al. 2002), Norway (Welle-Stran & Thune 2003) and the UK (Mason & Slater 2005). The US military has carried many research studies relating to the use of e-learning particularly to support distance learning. The US military is a much larger, well-financed and diverse sector than its equivalent in Australia. It also has an established history of distance learning (Wisher, Sabol & Moses 2002) whereas the Australian Army has adopted a residential delivery model.

Many of the publications available from the US military were announcements of e-learning projects or activities rather than research-based studies or critical reviews. However, these accounts indicated that the US military, including the Army, was involved in a wide range of e-learning developments across many sites to provide training and education opportunities to a wide range of soldiers. There were also many research-based studies, particularly from the US Army Research Institute for the Behavioral and Social Sciences (2005) and the Department of Defense (2005) Advanced Distributed Learning (ADL) program.

This thesis represents the first external research on e-learning in the Australian Army and informs the international military literature and general literature relating to factors influencing e-learning effectiveness. The sources of data about the Australian Army’s e-learning developments were collected after contacting the Army and negotiating access to
internal correspondence and reports. A discussion of the Australian Army’s e-learning projects and evaluation up to the beginning of this thesis project is provided in section 2.4.4.

2.3.1.2 Research approaches used in the literature

Data collection in these studies involved predominantly quantitative or mixed quantitative and qualitative methods. To reduce the inherent complexity in education and training situations, most of the studies located used a deductive research approach by selecting pre-determined outcome variables to measure. However, Galloway (2005, p. 21) was wary of this approach, ‘The effectiveness of any training endeavour can be measured using any outcome that an organization deems relevant: however, evaluation on only one set of criteria can lead to biased conclusions’. There were examples of mixed approaches combining positivist ‘cause and effect’ measures with interpretivist methods, including stakeholder interviews or questionnaires to supplement outcome measures. Research focusing on the relationship between pedagogies and effectiveness tended to use more qualitative methods focusing on student and teacher perspectives. Very few studies relied on qualitative approaches alone or used an exploratory inductive approach.

Despite the volume of research in this area, there was little evidence of research-derived theoretical models based on experiences of e-learning in the VET sector. One grounded theory generated model was located which was based on interviews with teachers, mostly from TAFEIs in the Australian VET sector (McKavanagh et al. 2002). McKavanagh et al. proposed a ‘theoretical framework for Web-based flexible learning evaluations derived from a conversational framework for teaching obtained from research on what constitutes good teaching and learning practice’ (p. 6). While the study claimed to have used a grounded theory approach, it used a constructivist learning theoretical framework of ‘conversational theory’ proposed by Laurillard to develop the research approach. Therefore, the research was framed within the context that ‘What is important is that good teaching in web-based flexible learning will involve engaging learners in rich “conversations”’ (McKavanagh et al. 2002, p. 8). However, Glaser (2004) argues that it is preferable not to use mixed methodological approaches with pre-determined concepts that influence the grounding of the model in the concerns of respondents.
In general, the research methodologies used in the literature reflected the preferred research approach used within the research context. For example, higher education research predominantly used a mixture of inductive and deductive approaches using quantitative and qualitative methods. The corporate sector used quantitative research approaches that provide cause and effect outcomes. The US military also tends to use experimental, quantitative approaches. This thesis adopted a deductive approach that did not use pre-determined models of e-learning adoption or diffusion factors, such as Rogers (1995) or Ely (1999). This inductive approach allowed the variables that were important to the respondents to emerge. Therefore, this thesis fills a gap in the general literature relating to e-learning effectiveness by adopting an exploratory approach to develop a model of factors influencing e-learning effectiveness that is relevant and fits the organisation.

Some single site case studies considered the outcomes and effects of particular e-learning innovations. There were some large multi-site study research across Australia, especially reports contracted by ANTA related bodies in Australia (Curtin 2002; Hill et al. 2003; I & J Management Services 2005a). However, while sector-based empirical studies provided context-based conclusions, they also often reflected on the difficulties in doing multi-site research.

For example, Curtin (2002) highlighted a number of problems in accessing standardised data collection across Australian VET sites, including the different State TAFE systems, differences in definitions used for e-learning, differences in student enrolment and course completion data, and the different levels of access to sites provided to researchers. The outcome of the diversity of this situation was that ‘no one method for assessing learning effectiveness could be used’ in the study (Curtin 2002, p. 22). Such comments indicate the issues for research based on multi-site literature reviews where the influence of individual organisational priorities was not considered. This thesis presents the findings from a single case study of large organisation that allowed the complexity of interactions between variables to be expressed.

Furthermore, Brennan, McFadden, and Law (2001) concluded from a review of e-learning effectiveness international literature: ‘The gaps between the often rhetorical claims of “effectiveness” and the reality of well-researched studies are not often bridged’ (p. 64).
Therefore, this thesis aimed to address the identified gap in the literature by providing a substantive model of factors influencing e-learning effectiveness grounded in the experiences of a large, diverse organisation.

2.3.1.3 Dichotomy of effectiveness

The subjectivity associated with ‘effectiveness’ has been mentioned by many authors: ‘This concept is difficult to tie down. One person’s effectiveness is another person’s failure’ (Brennan 2003, p. 18). Cashion and Palmieri (2002) started their literature review on perceptions of ‘quality on-line learning’ in Australian VET with a similar statement: ‘Definitions of quality online learning are as varied as the range of different learners that are studying online’ (p. 49). Similarly, Calder (2000) considered that exploring best practice in e-learning could be expressed as ‘beauty lies in the eye of the beholder’.

However, this thesis proposes that rather than interpreting these statements as indicators of complexity, they indicate that it is more useful to consider the relevance of context and perspectives in e-learning effectiveness studies.

In the literature review there was a dichotomy of research focus based on how the technical, learning and teaching components of e-learning were defined and examined. Firstly, the technological determinist type of study looked at how the use of ICTs relate to outcomes in education or training. This group of studies was termed for this thesis as technological effectiveness studies, which includes cost effectiveness studies, comparative media outcome studies, and benchmarking or performance indicators (section 2.3.3).

Alternatively, other studies looked at how particular learning approaches or teaching methods could be encouraged by using ICTs. This group of studies were termed pedagogical effectiveness studies. These studies predominantly researched how constructivist-learning approaches could be achieved using Internet technologies. These pedagogical effectiveness studies include investigations into the type and amount of online interaction or participation, teacher effectiveness, and student satisfaction studies.

However, there was contention between aspiration and actual achievement of constructivist learning outcomes as an indicator of effectiveness (section 2.3.4). The review indicated that educators and researchers were grappling with the interactions and overlaps between pedagogical and technological advancements and applications to encourage effective e-learning situations. The categorisation of the research is not to imply
that there were no overlaps in approaches or focus. However, it is useful to consider the research within this framework in order to understand the underlying influences on perceptions of e-learning effectiveness.

It was evident that while theoretical assumptions underpinned discussions of e-learning effectiveness, the inherent assumptions and expectations were not often made explicit in the research. Therefore, it was useful to consider the sociological theoretical concepts of ‘technology determinism’ and ‘socio-technical’ perspectives (Surry & Farquhar 1997) to discuss the scope and trends in the literature. This approach was not intended to provide a theoretical framework to drive the research but it assisted in developing sensitivity to the concepts emerging during the field-based research.

2.3.2 Technological effectiveness

A ‘confusion of technologies’ in research was discussed by Clark (1994, e.p) who argued that there was a need to separate media and method. He proposed that ‘Delivery technologies influence the cost and access of instruction and information. Design technologies make it possible to influence student achievement’. Both of Clark’s hypotheses were expressed in technological determinist terms, in that e-learning effectiveness is achieved by using a particular product or design system. It was also evident that technological determinism was the dominant assumption in the research literature.

Course designers were promoting the availability of synchronous and asynchronous online communication educational technologies as inherently beneficial for learning. This tended to create a technological determinism perspective in the e-learning market. For example: ‘In order for educational software to maintain its innovative edge, instructional designers need to access models that recognise the variety of proposed guidelines for developing technology supported learning environments that support a constructivist approach’ (Harper & Hedberg 1997, e.p). While this is an extreme example, the more recent implementation of e-learning Content Management Systems (CMS) in educational and training organisations, such as Blackboard and WebCT, has led to technological transformation statements. For example, Enjelvin (2002, p. 19) discussed ‘value-adding technologies’ in the context of ‘when [the university] selected WebBoard as its campus-
wide virtual learning environment and encouraged its adoption, e-learning became the central feature of the Department’s learning and teaching strategy.

Therefore, the drive to invest in educational technologies has encouraged a range of determinist ‘cause and effect’ efficiency studies. These studies include comparative media outcome studies that measure the results of technological implementation on learning outcomes compared with other delivery methods. Cost effectiveness studies, including Return on Investment (ROI) measure the efficiency results of e-learning projects, and benchmarking studies measure e-learning outcomes in terms of pre-determined performance criteria. Therefore, defining effectiveness in terms of education and training efficiency outcomes was a major aspect of the research.

There was an assumption (or hope) evident in these studies that the new technology adopted is superior to existing products or systems and the research aimed to determine this superiority. For example, based on a comprehensive international literature review of e-learning cost effectiveness literature Curtin (2002) provided this definition of effectiveness as the focus of a study of the Australian VET sector:

- a course or module which has the same or better outcomes as a traditional distance education or face-to-face course for the same economic outlay. Outcomes are defined as course completion rates, the academic achievement of students such as course pass rates, and satisfaction with the course by staff and students (p. 19).

Investigations of the pros and cons of these approaches indicated the limitations of focusing on particular variables as indicators of effectiveness without considering the overall context of the educational or training environment: ‘Every organization develops its own norms for acceptable levels of evaluation as well as expectations for the influence of evaluation on decision-making’ (Reeves & Carter 2001, p. 547).

2.3.2.1 Cost effectiveness

As discussed in section 2.2, the push for involvement in the information economy encouraged a focus on large-scale investment in e-learning projects, technologies and products. E-learning technologies are considered an efficient and effective way to deliver more training to more people. This perception is encouraged by reports, mostly anecdotal, of organisations saving money by investing in educational technologies (Strother 2002).
There is a corresponding need to justify this expenditure in terms of efficacy by measuring participation and cost outcomes. However, Reeves (1996, e.p) also argued that the growth in commercially produced and supported e-learning products resulted in a lack of evaluation since the ‘consumers of technological innovations for education seem to assume that because these innovations are advertised as effective, they are effective’.

E-learning research incorporated cost effectiveness studies in education (Bartley 2004; Jung & Rha 2000) and training (Fritzsche 2005; Gill 2003), including older studies in the military (Fletcher 1992; Fletcher & Orlansky 1989; Orlansky 1985). Cost comparisons between face-to-face or print delivery, and e-learning were carried out in higher education (Bartley 2004; Jung & Rha 2000) and in training (Curtin 2002; Pollitt 2005; Webb 1999). Other studies used either cost-saving as the focus of the research (Kecojev, Bise & Haight 2005; Morgan 2000) or as part of an overall strategy to determine a range of e-learning benefits (Gill 2003; Twigg 2003).

Reeves and Carter (2001) discussed evaluation strategies for Web-based training, and highlighted both the limited amount of theory and the gaps in practice. They used the example of Kirkpatrick’s ‘four level’ model of training evaluation developed over forty years ago, with the addition of ROI by Philips in 1994 (Figure 2.6).

<table>
<thead>
<tr>
<th>Level of training evaluation</th>
<th>Key question</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVEL V- ROI</td>
<td>Did the benefits of the training exceed its costs?</td>
</tr>
<tr>
<td>LEVEL IV- Results</td>
<td>Did the training have any benefits, e.g. improve profits?</td>
</tr>
<tr>
<td>LEVEL III- Behaviour</td>
<td>Did participants change their on-the-job behaviour?</td>
</tr>
<tr>
<td>LEVEL II- Learning</td>
<td>Did participant’s knowledge, skills, and attributes improve?</td>
</tr>
<tr>
<td>LEVEL I- Reaction</td>
<td>Did participants like the training?</td>
</tr>
</tbody>
</table>

Figure 2.6 Five levels of training evaluation (based on Kirkpatrick and Philips cited in Reeves and Carter 2001, p. 548)

Reeves and Carter (2001) noted that Kirkpatrick’s model was commonly referred to in training evaluation literature but not often carried out in practice, and that most training evaluation studies do not move beyond Level I ‘smilometer’ (p. 556). They argued that this general lack of higher-level evaluation also influenced evaluation of the design and implementation of e-learning. The inherent influence of the Kirkpatrick model on what is valued and what is measured in training was discussed.

There was a range of perspectives about the usefulness of the Kirkpatrick model for e-learning evaluation. Based on anecdotal feedback from industry, Abernathy (1999, p. 18)
argued that Kirkpatrick’s model ‘has weathered well. But it has also limited our thinking regarding evaluations’. Galloway (2005) suggested that hybrids of the Kirkpatrick model and ROI models could be modified to focus on the evaluation of learning, including intellectual property gained from e-learning ventures. Strother (2002) reviewed many e-learning effectiveness studies using the Kirkpatrick model, highlighting many research and practical issues. Difficulties included the control of variables in experimental studies, the use of scientific methods to compare different delivery methods and the complexity of factors influencing the study of education, including social, economic and global issues.

Reeves and Carter (2001) and Harris (2003) discussed the additional difficulties in measuring ROI for e-learning projects in large organisations. These issues included the wide range of departments involved in the design, purchase and installation of software and hardware and responsible for the design and delivery of training, each with their own budgets and priorities. Harris (2003) also mentioned the added difficulties with isolating the various costs involved with blended learning methods. He profiled the approach of some commercial ROI firms and found that simplifying the variables measured was a considered a good approach within workplaces. Thus, there were contentions between accounting for the complexity in workplaces and the need to focus on ROI variables to determine e-learning effectiveness.

Reeves and Carter (2001, p. 553) highlighted the difficulties in justifying the notion that benefits and effects are to be measured in monetary terms to different stakeholders who have ‘a stake in a different set of values’. Hall (2005) also raised the impact of deciding who benefits from e-learning. He was a critical of a trend in the US school system to use the ‘Total Cost of Ownership’ (TCO) method that compared technology costs with the value derived from investment. He argued that this approach focused on cost savings for financial planners, not on learning achievement.

The returns of improved training within an organisation have been considered difficult to define and to track. For example, Reeves and Carter (2001) mention the difficulties in comparing the relative impact of improved safety training with increased sales resulting from improved training, or how outcomes of badly designed e-learning on employees can be measured. Other efficiency concepts relating to improved access to training for dispersed employees, contract staff and compliance training and ‘speed-to-knowledge’
were discussed as ‘soft ROI’ concepts (Harris 2003 p. 34) that need to be considered but are difficult to measure.

From his experience in attempting to collect cost effectiveness data across the Australian VET sector Curtin (2002) also noted the difficulties for researchers in accessing organisations and obtaining confidential data. Reeves and Carter (2001) also indicated that it is unlikely that organisations would make bad ROI figures public, thus making it difficult to obtain objective research that would be useful for other organisations planning for e-learning.

Most of these studies focused on measuring a static concept of costs or returns related to e-learning outcomes at a particular time. However, the cost effectiveness of e-learning use relates to both initial adoption and to the ongoing sustainability of the project through ongoing organisational changes. Berge and Kearsley’s (2003, e.p) comparative study of e-learning in US organisations over a four year period found that constant changes in the organisations, such as mergers and management restructures could lead to e-learning being ‘re-introduced’ and not being sustainable. They also raised broader research questions about the impact on e-learning projects of organisational change, technology changes, the role of organisational support and the effect of organisational educational and learning philosophies. These experiences reflect Surry and Farquhar’s (1997, e.p) definition of an ‘adopter’ view of implementation - that the growth of technology is an ‘evolutionary’ process that depends on the ‘human, social and interpersonal aspect’ for its acceptance and adoption by the end user.

Understanding cost effectiveness factors is a contentious issue for education and training sectors. The large-scale investment in technologies to support e-learning has created demand for accountability with positive outcomes. Some frameworks are used from business and training domains to reduce the complexity of variables to include in e-learning effectiveness studies. However, the difficulties in isolating the cause and effect relationships in training programs exacerbate determining cost effectiveness outcomes of e-learning use. Therefore, isolating cost comparative variables reduces complexity but also produces a static and incomplete view of influences on e-learning effectiveness.
2.3.2.2 Benchmarking and performance indicators

Measuring and providing indicators of the quality of e-learning was the focus of some research, particularly from the higher education sector (Inglis 2005; Parry & Dunn 2000; Zimitat 2002). Discussions of whether e-learning requires a different set of performance indicators to other forms of education highlighted the differences in terms of the changing technological aspects of delivery and learner support. Calder (2000, e.p) argued that e-learning is not a ‘static innovation’ and that with changing technologies there will be ‘new delivery systems to be tested and adopted and new groups of learners to be reached’. Thus, the usefulness of static benchmarking or performance indicators for measuring e-learning effectiveness should be questioned.

Publishing performance indicators can influence what is being measured and valued. Jackson (2001) discussed the underlying push of the information economy agenda behind the growth of benchmarking in the higher education sector in the UK, which was ‘the provision of information to drive change in line with the government’s social and economic agenda’ (p. 232). Commercial interests in the development of educational technologies are also evident in a US benchmarking project, which was sponsored by the company, Blackboard (The Institute for Higher Education Policy 2000). There was also evidence of pre-determined criterion-referenced benchmarking that focused on required features of e-learning, such as flexibility (Zimitat 2002).

A performance review done for the AFLF (I & J Management Services 2005a) also reflects the inherent information economy assumptions embedded in the research. The Australian Flexible Learning Advisory Group (which is a part of the AFLF) derived performance indicators from international research and education agencies that ‘identified approximately 250 potential indicators of e-learning’ (e.p). However, the report was firmly grounded in the information economy agenda with the aim to ‘demonstrate the benefits of e-learning to VET clients and the community, and to show how e-learning contributes to the goals of the national training agenda’ (p. 1). Despite the strong component of e-business performance indicators in this report there was no explanation provided of how e-business related to e-learning. E-learning was also presented using technological transformation language: ‘E-learning is a critical means for transforming the central VET business of teaching, learning and assessment’ (p. 1).
The use of performance indicators implies a push for organisations to conform or compete to achieve higher e-learning uptakes based on pre-determined criteria of effectiveness. Rather than taking a performance-orientated approach to e-learning effectiveness, the concept of benchmarking can also take a process-orientated approach. For example, Parry and Dunn (2000) used qualitative research methods to explore the aspects of student interaction at a university in order to make recommendations to the organisation about the principles of the design of good teaching practices for e-learning. Using an exploratory approach provided an understanding of the factors and processes influencing effective e-learning in the organisation, which in turn informed good practice.

### 2.3.2.3 Comparative media outcomes studies

One of the main types of e-learning effectiveness research has been to measure and compare differences in learning outcomes when using and not using particular media in educational programs. Whereas traditional classroom teaching has been generally accepted as sufficiently effective, organisations are under pressure to prove that using e-learning ‘can be at least as effective as traditional classroom techniques’ (Crowther, Keller & Waddoups 2004, p. 302). After establishing comparable learning outcomes, the assumption was usually that implementing e-learning could be justified in terms of achieving other organisation goals, such as improved efficiencies.

Studies included comparison of the outcomes of e-learning teaching methods with face-to-face instruction in educational situations (DeBord, Aruguete & Muhlig 2004; Misko 2000; Sheard, Postema & Marham 2000) and in training situations (Misko 2000; Pollitt 2005; Schmeeckle 2003). These studies usually involved quantitative methods in experimental conditions to compare the assessment outcomes of students using educational technology with previous or current outcomes of students not using the technology, usually in a traditional face-to-face classroom situation. Most of this research has found no significant difference in learning outcomes between technology-based and conventional delivery methods.

Russell (2005) has attempted to synthesise the huge range of comparative media outcomes studies in a book and by collecting examples of research studies on a Web site to support his argument of the ‘‘no significant difference’’ phenomenon’. This Web site provides an ongoing collection of over three hundred media comparison studies in education going
back to the 1920s. Russell’s overall conclusion was that there was ‘no significant difference’ (in a measured or statistical sense) in student outcomes when the independent variable was the method of course delivery. However, Russell has also collected studies indicting that there was a ‘significant difference’ across a range of course delivery modes.

A scan of Russell’s Web site found that the great majority of the papers were from the US tertiary education sector. It was difficult to locate any papers from a workplace context, except four papers that were from the US military sector before 1995. The military research measured the differences for distance learners using videodiscs, compressed video or computer-based training and found that learners benefited either in outcomes or in satisfaction from using learning media. Although this summary of comparative outcome research does not indicate that other papers from the workplace sector have not been published, it does suggest that the military sector used this research approach.

Caffarella (1999) investigated the themes of US doctoral dissertation research in educational technology from 1977 through 1998. He found that one of the most ‘startling trends’ (p.487) was the reduction in the number of studies that compared the value of one medium to another from the 1970s to the late 1990s. He also found that there had been ‘a clear shift in research methodology’ (p. 488) with experimental studies dominating the 1970s and declining through to the late 1990s when qualitative research designs predominated.

While counting the various types of research papers was not an aim of this thesis, an overview of more current studies confirmed Cafferella’s findings, but it also indicated that comparative media outcome studies were still popular from 2000 to 2006. Comparative outcomes studies have continued to include a range of comparisons of outcomes using ICTs. The increasing range of educational technology products and Internet-based tools also encouraged the comparison of learning outcomes using different technological tools. Such research included comparisons of PDAs with paper-based methods (Segall, Doolen & Porter 2005), online course management systems (de Boer & Fisser 2002), multimedia interactive features (Zang, Zhou & O'Briggs 2006) and control features of the e-learning program (Aly, Elen & Willems 2005).
Comparative media research was also evident in recent US military-based studies. In general, the military research quoted positivist statements from previous studies about e-learning outcomes as justification for using e-learning. These statements were usually presented as fact and predictive, such as ‘a learning effect size as much as 0.50 standard deviations’ will be achieved using e-learning (Barker & Brooks 2005, p. 209). The Australian Army also adopted a comparative media approach in trialling the use of e-learning courses. It used experimental control groups to compare learning outcomes from e-learning classroom based delivery with face-to-face classroom based delivery. The trial reports indicated that the results provided ‘no significant difference’ type findings (section 2.4.4.3).

There was a common quotation used in the military comparative outcomes literature: the ‘Rule of Thirds’ (Barker & Brooks 2005, p. 209; Wischer & Olson 2003, p. 1). That is, that the ‘use of Computer Based Instruction reduces the cost of instruction by one-third, and additionally either reduces the time of instruction by about one-third or increases the effectiveness by one-third’ (Wisher & Olson 2003, p. 1). However, in the original source provided (Fletcher 2001), there was no mention of the ‘Rule of Thirds’. Instead there was only a passing reference to the statement that ‘many studies have found that allowing students to use technology-based instruction to progress at their own rates and receive material tailored to their own needs reduces overall time-to-mastery by about 30 percent’ (Fletcher 2001, p. 8). There were no absolute statements made about cost effectiveness or learning effectiveness. The context of the previous studies quoted and the variables included (or not included) were not questioned or explained. Therefore, some caution is necessary in interpreting the positivist conclusions of some of the comparative outcome research, including an examination in terms of the context of the research sources.

Authors have debated the usefulness of comparative media outcomes studies (Clark 1994; Conger 2005; Joy & Garcia 2000; Russell 2005). In particular, these critics have highlighted the complexity of exploring the factors influencing e-learning effectiveness. Experimental research designs used in comparative outcome studies attempt to reduce this complexity of factors. However, problems in providing definitive findings about comparative outcomes stem from the inherent difficulties in isolating individual variables in an educational situation.
While managing complexity is an issue for any research in educational settings, the lack of control of variables is a specific problem with the positivist, quantitative approaches usually used in comparative outcome studies (Conger 2005). As Agostino (1999, e.p) argued ‘Learning and education occur under complex, social conditions. These conditions are rudimentary, messy and fuzzy, and do not easily lend themselves to traditional, experimental design’. Therefore, one of the main criticisms of using comparative outcome approaches is that the large number of variables that influence an educational or training setting are not controlled and further that they are not accounted for in interpreting the results.

There are a few examples of large multi-variable or multi-site comparative outcome studies that illustrate the strengths and weaknesses of this approach. Yaakub (1998) did a literature search to locate comparative outcome studies for technical education from civilian and military settings. He highlighted the importance of context, which he presented as a qualifying but unidentified factor: ‘Generally, the meta-analyses have shown positive effects of Computer Assisted Instruction over traditional instruction but the magnitude of these effects varies according to features of the individual or primary studies’ (Abstract). Of note for this thesis, Yaakub found ‘no significant difference’ between civilian and military settings (p. 81). The lack of identification and consideration of contextual factors on the overall results has made it difficult to understand the complexity of influences on e-learning effectiveness.

From a review of the comparative media effectiveness literature, Olson and Wisher (2002) concluded that ‘there is little consensus as to what variables should be examined or what measures of learning are the most appropriate, making comparisons between studies difficult and inconclusive’ (e.p). Comparative media outcome studies can provide an overall indication of possible trends in the impact of technology use on learning outcomes. However, there are problems with deterministic interpretations about cause and effect outcomes that do not consider the interrelationships between possible variables in the e-learning environment.

2.3.3 Pedagogical effectiveness

Other studies focused on pedagogical aspects and the effectiveness of using particular technological features to facilitate learning opportunities. The aim of this review is not to
suggest that one pedagogical approach is better than another approach, rather it is to understand the scope and trends in the literature. There are models being proposed of effective pedagogies to support the use of e-learning methods. There was no consolidated discussion located, however, of how e-learning effectiveness studies fit within learning paradigms. It was also evident that there is little critical review of the development and use of pedagogies and paradigms. There were gaps in available field-based research from workplaces.

2.3.3.1 What is the role of pedagogy?

The aim of achieving effective learning outcomes by using effective instructional design continues to be a focus in the e-learning literature. The focus has been on either transferring established learning theories or instructional design to e-learning situations, or developing new or different educational design considerations for e-learning situations.

Clark (1994) wrote a series of papers during the 1980s and early 1990s dismissing media comparison or outcomes studies with the statement ‘media will never influence learning’ (e.p). One of Clark’s main proposals was the ‘replaceability test’. He argued that as there were different media attributes that could contribute similar learning opportunities, so there must be other variables that are ‘instrumental in learning gains’. Standardised measurement of learning outcomes of the same course designed with the same learning objectives, delivered through two different media, is likely to produce similar outcomes. He concluded that ‘learning effectiveness of instruction’ is ‘caused by the instructional method embedded in the media presentation’ not the structure of the media (Clark, 1994, e.p). Therefore, Clark argued against focusing on the influence of delivery technologies on learning. There was an underlying assumption that developing and implementing a superior learning theory or instructional design would produce effective e-learning.

An instructional design driven approach was supported by a major behaviourist-learning proponent, Gagne (1985). Gagne’s Instructional Systems Design (ISD) has been adopted in the Australian Army and is the basis of the Army Training System (ATS) (Greenberry 2004). Gagne initially published his ideas about different levels of learning in Military Training and Principles of Learning in 1962, when the US was concerned about updating the education and military training systems to participate in the ‘space race’ (Leigh n.d.).
This demand encouraged the further development of the structured behaviourist model of learning developed for the US Army in World War II.

Gagne proposed a model of the ‘conditions of learning’ that provided a structured teaching sequence of nine instructional events that should satisfy or provide the necessary conditions for learning and serve as the basis for designing instruction and selecting appropriate media (Gagne, Briggs & Wager 1992). In line with Clark’s (1994) proposal, Gagne, Briggs and Wager viewed media as delivery technology: ‘a vehicle for the communications and stimulation that make up instruction’ (p. 205). Effectiveness studies using a behaviorist framework focused on comparative media studies, usually measured as assessment outcomes.

Clark (1994, e.p) argued that instead of focusing on technology as the solution, it is important to develop a user requirement approach. That is to focus on the problem, ‘for example, the need to increase achievement, or access instruction or to address the labour intensiveness of instruction’. From the identification of the problem, then the focus was to locate ‘robust, research-based theories that can support the development of a variety of solutions to those problems’. He discussed various aspects of the learning situation that should influence instructional design, including relative efficiencies, different cognitive approaches, learner pre-conceptions and motivation. Therefore, Clark argued that instructional design required some consideration of the context of relative economics and learning effectiveness that influenced the selection and use of any media support.

One study took this approach further and investigated the impact of instructional design choices for e-learning on learning gains. Hannon, Umble and Alexander (2002) compared principles from both a behaviourist approach and a constructivist approach to their e-learning course design. They gained feedback on student performance and satisfaction from these two approaches, which guided the future use of technologies and the design of the course. These researchers also found social factors outside these two models were affecting students’ perceptions of factors influencing their learning. So, while using theoretical models to guide instructional design has considerable benefits, there can be other issues in the e-learning environment that influence learning processes and outcomes.
2.3.3.2 Social constructivism

One of Clark’s main opponents was Kozma (1994) who argued for a shift in perspective from the deterministic behavioral approaches embedded in much of the course design and research, to a social constructivist approach. Kozma argued that there was a need to ‘consider the capabilities of media, and the methods that employ them, as they interact with the cognitive and social processes by which knowledge is constructed’ (p. 7). Consequently, Kozma proposed that the key question to be asked was ‘In what ways can we use the capabilities of the media to influence learning for particular students, tasks, and situations?’ with a focus on describing, as much as possible ‘the complex interactions of these events in particular situations’ (p. 16). He shifted the debate from identifying necessary conditions for learning, to consideration of the attributes of the technologies within the social context of learning.

There are research studies, particularly from the higher education sector, that have embraced theorists who describe the social context of learning and learner-centred learning. The approaches adopted in these studies include Piaget’s constructivism (cited in Bonk & Cunningham 1998), Vygotsky’s social constructivism (cited in Angeli, Valanides & Bonk 2003; Bonk & Cunningham 1998; Campos 2004) and more recent active learning models, such as Laurillard (cited in Hannon, Umble & Alexander 2002; McKavanagh et al. 2002). Other e-learning effectiveness studies promoted theorists that encouraged an understanding of learning processes through cognitive science approaches based on face-to-face interactions, such as Salomon (cited in Campos 2004), or organisational learning theorists, such as Senge et al. (cited in Driver 2003). Therefore, these researchers argued that effective e-learning design is based on the use of established learning theories. Laurillard (2004, e.p) summarised social constructivist theorists as recognising ‘that learning concerns what the learner is doing, rather than what the teacher is doing’ (emphasis in original) and that ‘promoting active learning in a social context’ should be the aim of higher education. Gunawardena, Lowe and Carabajal (2000) reflected on the shift away from behavioural objectives with clearly defined outcomes for learners, to the more ‘open-ended nature’ of constructivist learning and they were concerned that: traditional evaluation methods used to evaluate learning within the four walls of a classroom do not transfer well to the online context’ and that there was no consistency in approach to discussing effectiveness within these new e-learning environments (p. 1677).
Kimble (2005, e.p) argued that taking a social constructionist perspective would focus on different stakeholder perspectives, and how the ‘shared interpretations of the meaning of a certain technology arise and effect the development of and interaction with that technology’.

This thesis falls within the research paradigm of social constructivism as it explores the factors influencing effective e-learning from the perspective of those involved within the context of the Australian Army. However, this research focus does presume that the Army has taken a social constructivist perspective to design or deliver e-learning. The Army had adopted behaviorist instructional design approach, particularly for the non-commissioned soldier training, which has influenced the approach to e-learning. So, it is important to distinguish between the research paradigm adopted and the e-learning paradigm being used in the organisation.

2.3.3.3 Interaction and collaboration

Social constructivist effectiveness studies predominantly used examinations of student-teacher interactions and discourses in e-learning. In particular, the studies focused on improving collaborative online learning opportunities using ICTs, especially Web-based instruction. The research included a technological effectiveness focus on how technological features could enhance constructivist teaching and learning processes (Belenich, Orvis & Wisher 2003; Bonk & Cunningham 1998; Brush & Saye 2000; McKavanagh et al. 2002). Other studies included a pedagogical effectiveness focus on how constructivist strategies provide methods to exploit technologies to improve learning (Coomey & Stephenson 2001; Duffy & Cunningham 1996; Hill & Hall 2001; Neo & Neo 2002).

There is also discussion on the development of new approaches to support e-learning design and use, including ‘new pedagogies’ (Stephenson 2001), ‘digital pedagogies’ (Cronje 2003) or ‘pedagogical effectiveness’ (Brennan 2003). Pedagogical effectiveness was also discussed in terms of the features of a constructivist learning environment, such as encouraging the development of an effective community of learners (Campos 2004; Hill & Hall 2001; Littleton & Whitelock 2005), an ‘ideal learning situation’ (Cox, Carr & Hall 2004), ‘quality discourse’ (Angeli, Valanides & Bonk 2003) or ‘successful collaboration’ (Wu 2003). Alternatively, those with a more positivist approach have used
this data to provide evidence of how well students were achieving intended learning goals, such as problem solving skills in a military course (Orvis et al. 2002).

One of the most common methods used to understand the effectiveness of e-learning environments is student satisfaction surveys of how, or how often, students are using ICT tools, whether they like using the tools and the effectiveness of teacher facilitation. These studies were undertaken in education situations (Dick & Hanna 2002; Hudson & Kim 2002; Newton & Ledgerwood 2001) and training situations (Brown et al. 2003; Cashion & Palmieri 2002; Choy, McNickle & Clayton 2002) including the military (Wisher, Sabol & Moses 2002). Although social constructivist teaching approaches focused on the provision of a satisfactory learning experience, some research relied on the availability of online statistical data to document to analyse student participation in courses as evidence of effective learning processes.

Quantitative research approaches included analysing the usage patterns, the number of messages, the time online, and the number of interactions or the types of interactions (Barrett & Lally 1999; Orvis et al. 2002). In discussing the criteria for judging the success of collaborative e-learning environments, Holst (2000) highlighted the difficulties in selecting variables that could influence learning outcomes and warned of the danger in mistaking high level student interaction with high quality learning. It was evident that some of the quantitative studies had very few participants and did not consider broader social and contextual factors. Holst (2000) and Crowther, Keller & Waddoups (2004) argued that effectiveness studies represent only selected variables, at one particular stage of implementation as indicators of success within developing theoretical frameworks.

Qualitative approaches have included analysis of discussion board or chat room texts including types of discussion or arguments (Angeli, Valanides & Bonk 2003; Cox, Carr & Hall 2004; Littleton & Whitelock 2005), which were supplemented with student questionnaires (Driver 2003; O'Reilly & Newton 2001a; Sosin 2000) or reflective interviews with students or teachers (Cox, Carr & Hall 2004; Sosin 2000). The studies often provided recommendations for improving the design of the teachers’ facilitation role (Hootstein 2002; Luczaj & Han 2002; Wu 2003). It was evident that teachers’ access to collaborative learning technologies did not always achieve the intended learning aims (Angeli, Valanides & Bonk 2003). There were suggestions that effectiveness studies do
not always consider the wide diversity of student characteristics and learning preferences (Hill et al. 2003). These limitations influenced the validity of general conclusions about the factors influencing e-learning effectiveness.

The overall acceptance of the use of online interactivity as beneficial for learning tends to reduce critical reflection of these results, such as whether the availability or use of these tools was influencing the quality of the learning experience or providing effective learning opportunities beyond an observed increase or change in online interactions. Some researchers acknowledged the importance of understanding the learning context and the complexity of motivational and affective variables influencing the student and teacher perspectives on effectiveness (Angeli, Valanides & Bonk 2003; Sosin 2000). The great diversity of learning settings where these collaborative tools are being used, even within the higher education sector, was generally not acknowledged.

This thesis has adopted an exploratory socio-constructivist research approach to understand the context of e-learning effectiveness in the Army based on an analysis of stakeholder perspectives. The Glaser and Strauss’ (1967) dictum that ‘all is data’ is used to understand of the influence of interacting contextual factors on e-learning effectiveness.

2.3.3.4 Pedagogical effectiveness misalignment

The availability of ICTs has been promoted as an opportunity to encourage a pedagogical transformation. Teacher-centred learning is to be transformed, to more learner-centred learning situations, or to provide more self-directed learning opportunities. The push for a pedagogical transformation in the higher education sector also influenced the determination and understanding of the factors influencing e-learning effectiveness in workplaces. Promotion of constructivist learning principles in training policies and practices increased during the late 1990s, evident in the Australian VET sector (Brennan 2003; Brennan, McFadden & Law 2001) and the US military (Abell 2001; Belanich, Orvis & Wisher 2003; Bonk & Wisher 2000; Curda & Curda 2003).

Despite the push towards developing and using constructivist learning principles to guide e-learning design, many Australian and overseas VET sector studies indicated conflict between the expectations of social constructivist design and the experiences of e-learning (Bate, Robertson & Smart 2003; Brennan 2003; Brennan, McFadden & Law 2001; Fisher
2000; Welle-Stran & Thune 2003). For example, ‘Online pedagogy is frequently characterised as “constructivist”. However, the reality of the delivery matches very poorly against the assumptions that underpin this particular view of teaching and learning’ (Brennan 2003, p. 6). Similarly, a study of a university and a telecommunications company using e-learning in Norway (Welle-Stran & Thune 2003) identified a contention between perceptions of pedagogy in policy and practice that they described as ‘a kind of organizational schizophrenia’ (p. 191).

The influence of promoting social constructivist principles on teacher and student expectations was also recognised:

Pedagogy practice rarely conforms to these principles. The dominating influence of the technology has created assumptions about the nature of learning, the role of the teacher and the student characteristics, and these are poorly matched with teacher and learner expectations (Brennan 2003, p. 5).

There were reports of conflicts in student perceptions of e-learning effectiveness in an investigation into the meaning of quality learning for Australian VET online learners (Cashion & Palmieri 2002). ‘These students were very positive about the flexibility, freedom and convenience of the online environment, but were quite clear that they did not prefer it to face-to-face classes’ (Cashion & Palmieri, p. 9). Furthermore, there were studies that found that the assumptions made about the advantages of learner-centred and self-paced e-learning did not suit all learners, particularly those in training contexts (Cashion & Palmieri 2002; Choy, McNickle & Clayton 2002; Smith 2003; Smith, Wakefield & Robertson 2001; 2002), including the military (Wisher, Sabol & Moses 2002).

The conflicts between policy and practice was also reflected in many of the AFLF reports that provided scenarios that were typical in the formal education setting of TAFE, but not the workplace training context. For example, Cashion and Palmieri (2002) argued the ‘the secret is the teacher’, focusing on teacher support and interaction for providing a quality VET online learning experience. However, much workplace training takes place without the presence of a teacher or instructor, in situations that are more informal or in independent learning situations (Bate, Robertson & Smart 2003; Bate & Steketee 2006; Burns 1995). Similarly, Brennan, McFadden and Law (2001) found evidence of a misalignment in the Australian VET sector where e-learning content design guidelines...
were based on interactive distance learning Internet-based settings, while courses were being delivered in non-Internet environments, primarily in face-to-face classrooms.

Hill et al. (2003) considered the impact of constructivist learning assumptions on the evaluation of e-learning in the VET context: ‘The definitions also operate within the constructivist assumptions about involvement and participation by students, yet there appears to be little evaluation made of how these assumptions function in the online environment of the VET sector’ (p. 44). Therefore, these studies clearly indicate that there is misalignment in the VET sector between the notions of good practice using constructivist, self-directed learning models developed largely in the higher education sector, and the expectations and experiences of VET practitioners and students.

While the literature identified misalignment between policy and practice, this contention has not been adequately addressed. From an extensive overview of international e-learning effectiveness literature, Brennan (2003) found that the subject is ‘complex and multifaceted’ and argued for more grounded understanding of practice: ‘Online pedagogy needs to address all the dimensions of practice’ (p. 6). There were also requests for more workplace studies that focused on the experiences and expectations of all stakeholders (Bate, Robertson & Smart 2003; Welle-Stran & Thune 2003). Well-Stran and Thune (2003) concurred from their international research into workplace e-learning that ‘though there is a lot of information about e-learning solutions, knowledge of actual use is still limited’ (p. 191).

Therefore, this thesis contributes to the gaps in the knowledge of influences on e-learning use and effectiveness from the perspective of stakeholders in a large organisation. It provides an exploratory case study that does not make pre-determined assumptions about pedagogical or technical effectiveness criteria. This approach allows an understanding of the influence of the context on how e-learning effectiveness factors are conceptualised in an organisation.

2.4 Understanding e-learning workplace contexts

As the above discussion on effectiveness studies highlights, the priorities for e-learning vary according to intended outcomes. While researchers have acknowledged the growing body of research relating to technology, pedagogy and management aspects of e-learning,
there were gaps identified in understanding the influence of workplace contexts: ‘little is known about the thinking that lies behind the decision to adopt or not e-learning solutions, or how the corporate context affects that decision’ (Schofield 2003, p. 163). Further, while some research focuses on the priorities of e-learning in the corporate sector, research that reflects the Australian public service context is limited.

Outside the formal education sector, organisations do not necessarily have learning as the primary objective (Schofield 2003; Welle-Stran & Thune 2003). Previous research with the Queensland mining industry highlighted that although training was essential for the organisation for employees to gain workplace skills, particularly from a safety viewpoint, training was not focus of the main business or activity (Newton 2002; Newton & Hase 2001; Newton, Hase & Ellis 2002). Establishing and maintaining e-learning projects competed for funding and infrastructure with other organisational priorities. This study aims to provide insights into the influence of the organisational requirements in a large public service organisation where training is essential to support mission critical functions but it needs to compete with other organisational priorities.

Some of the differences in goals between education and training contexts were highlighted in the e-learning effectiveness research (Bate, Robertson & Smart 2003; Bate & Steketee 2006). In particular, there were differences seen between the role of teachers in the education system compared to trainers, who may or may not be present in workplace e-learning situations. There were also differences noted in focus and expected outcomes between these two contexts, particularly in relation to the position of the learner (Boud 2003, p. 327). Some of the differences in contextual priorities are summarised in Figure 2.7.
Boud described the learner as being well defined in education contexts, and more ‘elusive’ in workplace contexts due the focus on organisational outcomes. Boud (2003; 2004) also highlighted the differences between the two sectors in terms of an ‘eclectic’ variety of learning innovations emerging in workplaces that provide learning options that were largely negotiated within the workplace context. Thus, the diversity in priorities and between education and training contexts influences priorities for e-learning use.

Boud (2003, p. 327) also argued that e-learning in workplace contexts was part of the ‘pluralisation’ of learning. This pluralisation of learning approaches is evident in the use of mixed modes of delivery or blended learning in the workplaces, using a combination of different ICTs or e-learning methods combined with face-to-face instruction (ELBD Services 2005; Schofield 2003). Blended learning approaches were being promoted in the workplace literature as ‘the next stage of e-learning’ in workplaces (Field 2003), with a focus on promoting a technological effectiveness perspective: ‘What combination of tools and media will give me the biggest impact for the lowest investment?’ (Bersin & Associates 2003, e.p).

Blended delivery approaches were being used in Australian emergency services, including the ambulance (Australian Flexible Learning Framework 2004b), the police (Australian Flexible Learning Framework 2004a) and the US military (Bonk et al. 2002a; 2002b). While mixed-modes of delivery were being used for training, there was also recognition of the lack of research into how mixed mode approaches affected e-learning effectiveness (Brennan 2003; Hill et al. 2003). Different pedagogical models were being developed and
used in workplaces with little documentation or research into how the workplace context affects the use of e-learning or its effectiveness.

Defining e-learning effectiveness in workplaces has become even more complex due to the rhetoric used in discussing the transformational aspects of e-learning approaches. E-learning is being promoted as a way to transform the pedagogy from a teacher-centred to learner-centred focus in many workplaces, for example in certain Australian companies (Schofield 2002; 2003), the Australian correctional services (Madsen 2003), the UK military (Mason & Slater 2005) and the US military (Abell 2001, 2003).

Schofield (2002; 2003) found that in the four Australian companies she researched, e-learning was viewed as a part of the process of transforming the organisation to meet business priorities. Some of the advantages in using e-learning approaches to transform the organisation that were highlighted were more efficient management of training processes, encouraging cultural change of customer service, providing strategic competitive advantage, recruiting and retaining staff and improving communication across the organisation. However, Schofield indicated that there are problems for organisations that are promoting e-learning without organisational support for change, as a way to transform the organisation.

Organisational culture factors have emerged as important but under researched in the implementation of educational technology innovations literature: What is not so clear is the role of the setting in which the innovation is implemented’ (emphasis in original) (Ely 1999, p. 26). In 1999, Schofield challenged the ‘industrial-age mindset’ that had developed in the Australian VET sector and argued that there was a lack of recognition of the cultural assumptions and choices made in providing e-learning in VET. When discussing the diversity of cultures in the education and training sectors, the AFLF (2003) provided a very insightful comment for effectiveness research: ‘Each sector, quite predictably, takes its defining delivery technology and pedagogical culture as the ‘norm’ for current delivery, adapts the online environment to that culture, and then pronounces on how well e-learning ‘works’ - or doesn’t’ (p.10).

Understanding how the embedded organisational culture influences e-learning effectiveness is an issue that has not been adequately addressed in the literature. This
thesis undertakes an in-depth analysis of one organisation. The research approach encourages the respondents’ priorities for e-learning, within the organisational culture, to emerge.

2.4.1 E-learning effectiveness research in military environments

While the military is a specialised context for the investigation of e-learning effectiveness, it also provides a good setting for researching the influences on e-learning in large, dispersed organisations. The military sector research has its own training context and priorities that will be different across services and countries. It is not an intention of this section to compare e-learning outcomes in the Australian and international armies, however, it was possible to gain some understanding of the trends in research approaches in the publicly available military research. This review assists in locating the thesis in the military-based research.

Wisher, Sabol and Moses (2002) provide a concise summary of the strengths and weaknesses of e-learning effectiveness research for the military sector. These authors highlighted the need to understand the effectiveness of traditional training methods when examining e-learning approaches: ‘Instruction that is ineffective in the classroom is unlikely to be any more so when conducted in a distance learning environment, no matter what the media’ (Wisher, Sabol and Moses 2002, p. 14). In particular, the trend of doing research studies in higher education and not in training settings, the issues with comparative outcomes studies, and the general focus on usability and learner preferences rather than on understanding what has been learnt and retained.

2.4.2 Experiments and transformation

The availability of large numbers of soldiers in controlled training situations enables relatively large quantitative and experimental studies to be undertaken. The US Army has completed some early studies examining the comparative effectiveness of different media technologies in its training (Hoyt 1977; Longo & Giunti 1972). More of this early research was included in Russell’s (2005) ‘No significant difference’ database, which was discussed in section 2.3.3.3. These studies indicated the military’s early involvement and continuing interest in using technologies to assist learning. They also indicated the ongoing need to justify the use of educational technologies and to prove their comparative effectiveness using quantitative research approaches (Sitzmann et al. 2005; Yaakub 1998).
Other studies have carried out experimental tests on the impact of the use of certain technologies, such as Army cadets’ previous experience using PC based games, and satisfaction and success in a game-based training package (Orvis, Belanich & Mullin 2004).

A technological determinist perspective is evident in the research that supported the US Department of Defence Strategic Plan for distance learning. E-learning was required for ‘re-engineering the learning paradigm from a “classroom-centric” model to an increasingly “learner-centric model” ’ (Curda & Curda 2003, p. 4) as part of the ‘transformation to a soldier-centric learning model’ (Bonk & Wisher 2000, p. 41). The US military-based studies proposed that collaborative e-learning methods, such as discussion forums would be used in future Army learning situations (Abell 2001, 2003; Bonk & Wisher 2000; Bonk et al. 2002a).

Bonk and Wisher (2000) developed quantitative-based comparative research approaches that the US Army could use to evaluate collaborative e-learning methods. The proposed experiments suggested the use of control and experimental groups to compare the comparative outcomes of using, or not using, collaborative technology tools, or of providing different types of collaborative learning support. However, the US Army was not using collaborative e-learning activities at the time. While providing a comprehensive overview of higher educational research literature, Bonk and Wisher did not provide a critical review on the relevance of collaborative e-learning methods in the US Army.

Abell (2001; 2003) used knowledge of e-learning from the higher education sector, with little reflection, to support the development of constructivist learning principles in the US Army. Bonk and Wisher (2000) acknowledged that there had been a transfer knowledge of learning innovations from higher education to workplace training situations, despite the differences in education and training goals: ‘the former focused on the open acquisition of knowledge and that latter focused on improving job performance’ (p. 4). While noting the contextual differences including the ‘learning cultures, social interactions, motivational and affective factors that can influence the transfer potential’ (Siedel cited in Bonk & Wisher, 2000, p.4), Bonk and Wisher did not critically reflect on the adaptability of collaborative learning approaches from higher education to the military setting. Jansen et al. (2002) found that although constructivist methods were embedded in the design of a
Netherlands Army’s e-learning course, the instructor-led organisational culture dominated the design intentions. Thus, there were contentions between design intentions and experiences in evident in the overseas military research.

The available studies on the US Army’s use of collaborative e-learning indicated that it was used primarily in specialised, high level learning situations, such as the US Armor School’s Armor Captains Career course (Bonk et al. 2002a), Depth and Simultaneous Attack Battle Lab (Bonk & Wisher 2000, p. 4), Army researchers (Finlay 2000) and the Army’s Intelligence Centre (Ellsworth & Iorizzo 2001). US Army stakeholder perspectives of constructivist e-learning approaches using Web technologies were also available (Belanich, Orvis & Wisher 2003; Bonk et al. 2002a; Wisher, Sabol & Moses 2002).

Collaborative e-learning was being used to satisfy the requirements of specialised higher learning situations in military situations. There was no evidence found of collaborative e-learning methods being adopted for non-commissioned soldiers. E-learning effectiveness in this context was discussed primarily in terms of technological effectiveness using experimental comparative media studies or pedagogical effectiveness using perspectives of higher education collaborative-learning.

This thesis examines the issues in a non-commissioned Australian Army course, which provides operational and leadership skills for all soldiers. This study is potentially a new area of research in the publicly available military literature.

2.4.3 Stakeholder perspectives

Wisher, Sabol and Moses (2002) used an inductive and reflective approach to considering factors influencing effectiveness, which was not evident in most of the other military research. From the findings that highlighted soldiers’ caution about e-learning, they expressed concern about the large-scale investment in e-learning in the military over the long term. While recognising the organisational commitment to e-learning, they argued for recognising that soldiers had a ‘real sense of doubt regarding distance learning’ (Wisher, Sabol and Moses 2002, p. 19). The authors argued for more stakeholder analysis to inform e-learning effectiveness research: ‘Future development of distance learning must address soldier concerns and overcome the doubts that exist’ (p. 19).
An earlier military-based paper by Ellsworth (1995) provided insights into the use of exploratory qualitative research in the US Army. Ellsworth’s approach was similar to the qualitative approach used in this thesis, in undertaking stakeholder interviews including ‘planners and administrators’, ‘technical support personnel’, ‘instructors’, ‘instructional developers’ and ‘students’. While Ellsworth stated a preference for quantitative methods, he provided a justification for qualitative study: ‘for the study to identify interrelationships between the factors, it was essential that factors be described in the potential adopters’ own terms, as the relationships of interest were those that existed in their minds’ (p. 137).

Further, Ellsworth (1995) recommended that any future inquiry into e-learning diffusion should take a holistic perspective: ‘the diffusion problem as a whole (the innovation and its environment) from whatever mix of perspectives (acceptance and resistance) offers the most rigorous explanation of the observed phenomena’ (p. 145). Therefore, Ellsworth’s study indicates the novelty and benefits in taking an inductive research approach in a military setting to explore factors influencing e-learning. Ellsworth has since written on educational change models (2000a) and built on this research approach (2000b; 2001; Ellsworth & Iorizzo 2001).

While this thesis does not take a diffusion of innovations focus as its aim, it extends Ellsworth’s (1995) exploratory research to include the experience of users of e-learning in a military context. This thesis focuses on how stakeholder perspectives can inform the understanding of factors influencing e-learning effectiveness in military situations. By not using a pre-determined conceptual focus, this study also provides a model grounded in the respondents’ concerns and actions. It contributes to the gaps in the military research by using an inductive qualitative approach that allows the influence of the organisational context to be incorporated into the research. The use of an inductive, grounded theory approach could not be located in the military context literature; therefore, it is potentially a novel research approach in this area.

### 2.4.4 Australian Army e-learning projects

The main developments in the Army’s e-learning projects prior to the start of this research, in late 2003, are outlined, including some early evaluation studies of the Army’s e-learning courses. This study was the first external research in the Australian Army’s e-
learning and there was very little publicly available research on e-learning projects or research in the Australian Army prior to this study.

The TTC staff members were very co-operative and supportive of this study. After the initial meetings, they provided a series of confidential documents and reports relating to the decision-making processes involved in setting up the Army’s e-learning program from 1996. These Army documents provided relevant background for this section and were a source of data that contributed to understanding the themes and concepts emerging from the research.

An account of the Army’s decisions and e-learning developments up to 2004 based on these historical documents was written for an international conference paper, which constitutes the first public account of this history (Ellis & Newton 2004). The details provided below are predominantly from the internal documents and from two interviews undertaken as part of this study with retired senior Army training managers involved in setting up and developing the e-learning projects. While this section is primarily descriptive, it provides a basis for understanding where this research fits within the Army’s e-learning developments.

2.4.4.1 Prior to the Defence Efficiency Review (1996)

Prior to 1997, individual training was concentrated at over fifty training establishments throughout Australia. Typically, each of the training establishments specialised in a certain type of training (e.g. catering, signals) and trainees had to be transported and accommodated at these centralised sites for the residential training. In this conventional classroom training, it has been estimated that seventy percent of the costs were attributable to indirect expenses such as trainee travel, accommodation and time off from regular duties (Training Technology Centre-Army 2003, p. 2). These face-to-face classes were very resource intensive with high expenditure on materials and staffing. These resource costs were very high for some practical skills, such as the ammunition for practice target shooting. Given the rising costs of this training approach, particularly the indirect costs, alternative delivery modes were sought (Interview senior manager).

An efficiency review aimed to ‘produce the most efficient and effective Defence Force possible within current budgetary restraints’ (Department of Defence Australia 1996a, p.
This externally driven review required the Army to reduce training operating costs and led the Training Command to propose: ‘The selective exploitation of technology holds significant promise to enhance the Command’s training and doctrine by optimising the effectiveness of available manpower and resources’ (Headquarters Training Command-Army 1996, p. 1). This technological determinist goal resulted in the Technology-Simulation (TECHSIM) Development Project by the Training Command, which provided an overview of the state of e-learning projects in the Army and objectives for the future. Beyond reducing operating costs, the TECHSIM project supported other strategic goals including the requirement to deliver the same training outcomes, wherever possible and necessary, to both full-time and part-time personnel and, to reduce the training disruption to the Army’s user units without compromising training quality or outcomes (Headquarters Training Command-Army 2003, p. 1).

The TECHSIM overview of projects indicated that prior to 1997 there was a small, dispersed group of individuals involved in the development and delivery of ‘computer-assisted learning’ using multimedia. The most common form of educational technology use was of ‘Freelance Graphics’, a LitePro projector and accompanying high gain screens to supplement face-to-face classroom teaching. E-learning developments were dispersed and specialised. Some of the projects listed were:

- a self-paced learning course to familiarise and practise students in Services Discipline Law at the Land Warfare Centre
- 30 multimedia instruction courses developed at the Royal Military College
- 14 packages on specific mechanical training developed by the Army Logistics Centre
- multimedia packages specific to rotary wing aircraft developed by the Aircraft Maintenance School (Headquarters Training Command-Army 1996, p. 7).

The development and sustainability of these projects depended on the individual interests, skills and presence of individuals. The standard of this training also varied considerably, depending on the skills of staff involved (Interview senior manager).

Due to constant changes in staffing, many of these projects were abandoned when staff moved on to other positions (Interview senior manager). The TECHSIM document also noted that although both instructors and students ‘valued the use of technology in
instruction’ there were technical and educational problems (p. 7). For example, some computers in service could not be used to access multimedia packages.

There was one centralised CD-ROM package developed in 1993 from the paper-based doctrine library into the Army Doctrine Electronic Library (ADEL). This development was driven by the need for a standardised repository of military knowledge that would ‘penetrate all levels of military training so as to remain the firm foundation upon which the Army can train’ (Headquarters Training Command-Army 1996, p. 3). The ADEL was developed as a CD-ROM resource that ran in the Army Standard Hardware and Software Environment (ASHSE). The CD-ROM media was reported as ‘robust and portable’ and enabled access to the ADEL for personnel at home, while travelling, overseas and in the field. In 1996, ADEL contained 172 publications and incorporated graphics, video and a selection of multimedia packages.

There were problems with accessing ADEL initially due to insufficient supply of personal computers and peripherals, insufficient network cabling and limited bandwidth availability. With a change in the leadership of Training Command, the ADEL was moved to the Defence Restricted Network (DRN) in 1998 so that amendments could be published immediately at very low cost and it could be distributed more widely. Some training centres also used virtual simulation packages for weapons and vehicle training, however, these developments were fragmented and depended on the availability of suitable staff and infrastructure. Due to the high costs of ammunition, the Weapons Training Simulation System (WTSS) was supported for further development with final delivery in 1998. The WTSS has been found to reduce the resource consumption and provides a staged learning process through weapons assembly and safety procedures before going to the field for assessment (Interview senior manager).

Therefore, the 1996 Defence Efficiency Review provided the strategic support for the Commander of Training Command to initiate the TECHSIM project to meet Army training requirements using e-learning. This project aimed to ‘consolidate the Command’s use of Distance Education and Training (DET), technology and simulation’ to bring about ‘greater efficiencies and effectiveness with technology-based training being the keystone to the attainment of these goals’ (Training Technology Centre-Army 2003, p. 3).
2.4.4.2 Implementing e-learning in the Australian Army

Based on the TECHSIM recommendations, the Army determined that operating costs could be reduced while addressing the other strategic needs. The focus was to move to more decentralised arrangements with a significant part of the training to be delivered more flexibly in regional residential training using high-level technology with mentor or tutor support. Fifty specialised training schools were reduced to eight RTCs with the infrastructure to continue providing some specialist training centrally but with e-learning available for a range of suitable courses. The RTCs were planned during 1997 and 1998 and subsequently developed over 1999 and 2000.

In 1998, a prototype RTC was developed in Southern Queensland, just north of Brisbane. This development allowed testing of the infrastructure and piloting of courses as well as allowing this new approach to be highlighted to decision makers, including top-level politicians, who ultimately had to be brought onside. These RTCs were subsequently located in every major concentration of military population to provide training at times, in locations and in formats that reduced the requirement for travel, but that also minimised the disruption to units and maximised the opportunities for both full time and part time members to undertake training. The aim was to develop the RTCs to provide a flexible learning environment with access to face-to-face instruction and self-paced independent learning.

Accompanying this decentralisation of the training centres was the recommendation for centralised organisational infrastructure support. The focus was on:

- the development of the network connectivity throughout the Training Command
- provision of technical architectural standards that promoted the re-use of technologies across multiple systems and interoperability between systems
- modification to the Commands’ procurement processes to maintain currency in technologies and establishment of a technology coordination agency to interface with external providers
- enhancement of the technical expertise and awareness of Army personnel to maximise the successful exploitation of technology (Headquarters Training Command-Army 1996, pp. 9-10).
Thus, an externally driven policy requirement for efficiency in training provided the organisational support to implement infrastructure for e-learning development. These decisions cumulated in the formation of the TTC in September 2000. The aims of the TTC included ‘designing, developing and evaluating all Distance Education and Training (DET) and TBT for the Army’s Training Command’ (Headquarters Training Command, 2003, p.12). The Headquarters Training Command Instructions (2002b, p. 3) indicated that the ‘courseware developed by the TTC were to be viewed as a subset of DET’ and to encourage a move towards more self-paced learning. The control over e-learning course design and production was centralised in the TTC but technical specifications came from the wider Army environment. The other main specification was that all courseware had to be designed to run on the Army Standard Operating Environment (SOE).

Criteria for selecting courses for e-learning development were broad, including content that was largely information-based, where indications that flexible delivery would reduce operating costs and where large numbers of staff were required to be trained. The first courses to be targeted for e-learning development were subjects that involved high student movement costs and high training costs, such as those courses requiring regular refresher training for all personnel (e.g. navigation and first aid), and core courses for promotion (Subject 1 Sergeant and Subject 1 CPL). Other legislated courses were also targeted for e-learning (e.g. equity and diversity, fraud and ethics) with the aim that all staff would be able to do the courses in their own time and at their own pace (Headquarters Training Command-Army 2003; Training Technology Centre-Army 2003).

In response to the technical and operational requirements, Training Command did not initially focus on the development of networked e-learning development.

With the exception of a learner management system, this will not initially include on-line delivery until a number of issues are resolved, such as:

- soldiers spend much of the year training in the field, where they do not have access to the Intranet or Internet
- the limited bandwidth available on the DRN significantly restricts the instructional design of electronic and TBT products
- the DRN is not yet considered sufficiently reliable to support the efficient delivery of training (Headquarters Training Command-Army 2004, p. 7).
Furthermore, while there was an initial focus on the development of e-learning courses for
distance learning, this situation did not develop. Concerns with soldiers’ abilities to learn
independently and technical problems influenced this decision. The mode of e-learning
delivery in 2003 was that soldiers individually accessed multimedia CD-ROMs delivered
over a RTC intranet in classrooms during the residential training period.

2.4.4.3 Course evaluation

There was considerable trialling and evaluation during the development of these e-
learning courses before they were fully implemented. The Army’s training evaluation
process was described as ‘hierarchical’ (Headquarters Training Command-Army 2002a, p. 3) and the Instruction on the ‘Evaluation of Training’ included procedures that followed
Kirkpatrick’s model of training evaluation (Figure 2.8).

<table>
<thead>
<tr>
<th>Level and type</th>
<th>What is measured and evaluated</th>
<th>Measurement method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner and instructor reaction</td>
<td>Satisfaction (the ‘smile’ factor) Product efficiency and effectiveness (training delivery methodologies, including administration, accommodation, instruction, scheduling etc)</td>
<td>Formative evaluation of the training environment, training materials and processes Summative evaluation of the training environment, training materials and processes</td>
</tr>
<tr>
<td>Demonstration of learning</td>
<td>New Skills, Knowledge and Attitude (SKAs) attainment mastery</td>
<td>Assessment of individual training outcomes against competency standards</td>
</tr>
<tr>
<td>Application of training received on the job</td>
<td>Use of SKAs on the job training transfer (individual or team improvement)</td>
<td>Validation of job performance outcomes against original performance gap</td>
</tr>
<tr>
<td>Operational outcomes</td>
<td>Return on investment (organisational benefits)</td>
<td>Strategic evaluation against key performance indicators outlined in strategic plan</td>
</tr>
</tbody>
</table>

Figure 2.8 The types of evaluation in the Army (Headquarters Training Command-Army 2002a, p. 3)

However, there was no reference to Kirkpatrick in this document. The focus was on
providing a ‘continuous process’ to improve effectiveness of the training system or
provide feedback to people to improve performance’ (Headquarters Training Command-
Army 2002a, p. 3). These evaluation processes of the training and of the trainees’
competence are ongoing. The course feedback includes regular trainee feedback
questionnaires at the end of each module and at the end of each course. The feedback on
trainee competencies (including e-learning and other training activities) is provided
through formative assessment during the training sessions and the demonstration of skills
in the field and summative assessment of individual competencies. Therefore, there was a
structured outcomes focus to the evaluation process based on competency-based training.
The e-learning trials began early after the TECHSIM project and included the navigation course NAVPAC, originally part of ADEL in 1997 and the Basic First Aid course in 1999. The first aid trial was a comparative outcomes trial to investigate and test the effectiveness and efficiency of using the technology in support of training (Headquarters Training Command-Army 1999a). An experimental situation was used, one platoon receiving conventional instruction in first aid from instructors as the control group. Two platoons received first aid instruction using e-learning, and were supervised by an instructor ‘who clarified questions arising from the instruction’ (Headquarters Training Command-Army 1999a, p. 1). One of these experimental groups also had access to instructional aids (e.g. resuci-Annie and bandages), which was known as the ‘mixed group’.

Pre and post theory tests and a post-course summative test were used to measure effectiveness in the First Aid course trial. Efficiency was measured by the amount of assistance that was required, which was recorded in instructor logs. Despite technical problems in the e-learning group, the results indicated that they ‘out-performed the control group’ in the theory and received 100 percent in all of the practical tasks, after some repeated practices during instruction (Headquarters Training Command-Army 1999a, p. 8). Interviews were also conducted with the instructors and focus groups with the platoons. The conclusions indicated that the trial had experienced technical problems and that courseware needed to be tested using local software and hardware. Overall the trial conclusions were supportive of continuing e-learning use and recommended that ‘future trials be designed to exploit the strengths of ADEL and conventional instruction’ particularly for the ‘acquisition of procedural knowledge’ (Headquarters Training Command-Army 1999a, p. 9).

These trials supported the development and trailing of more CD-ROM modules in the Subject 1 CPL course that took place in 1999 (Headquarters Training Command-Army 1999b) and 2000 (Headquarters Training Command-Army 2000). Again, these trials involved experimental testing with control group of students using ‘conventional instruction’ and an experimental group using the CD-ROMs, both in a classroom setting, and with pre and post testing. The time taken to complete the modules was recorded and student focus group and informal instructor feedback was provided.
Various issues continued to emerge relating to computer illiteracy, technical problems, lack of self-paced learning opportunities and the role of instructors. There were also warnings about distance learning made throughout these reports indicating that it could not be assumed that students would take responsibility for their own learning. However, overall the trial reports found that e-learning had ‘matched the training effectiveness of traditional classroom instruction if all other training remains equal’. Further, that ‘TBT had no detrimental effect on other competencies’ with the conclusion that e-learning could be ‘effectively used in Army training’ (Headquarters Training Command-Army 2000, p. 29).

However, a major finding reported that ‘the transition to Multi Media training involves a significant cultural shift’ that required ‘close management of all those involved in the processes’ (Headquarters Training Command-Army 1999b, p. 25). In the 2000 trials, there was some concern about the role of e-learning in Army training. It was recommended that the CD-ROM courses ‘only replace the conventional lectures’ and that ‘trainees still require hands on and practical application of training for drill, skill and instruction’ (Headquarters Training Command-Army 2000, p. 30).

Nevertheless, these trials provided the support to implement the delivery of CD-ROM training modules throughout the RTCs. Furthermore, the Army won two Australian Interactive Media Industry Association Awards for ‘Best Education and Reference’ in 2002 for one of the e-learning courses, ‘Sergeant Offensive Operations Training’ and the award for ‘Best Training Package’ in 2003, which encouraged and promoted the TTC design and development processes (Greenberry 2004).

As the Army undertakes regular evaluations of the e-learning courses and e-learning courses are an established part of the training program, the study is not focused on duplicating or reviewing its evaluation processes. Rather, the research aims focus on understanding how e-learning effectiveness is influenced by the Army context, which is provided by gaining the perspectives of different stakeholders.

2.5 Conclusions

The use of pre-determined discrete measures of effectiveness dominates the e-learning research literature. Researchers use economic, technological and pedagogical concepts to
determine e-learning effectiveness outcomes. Problems with the complexity and fuzziness of variables in education and training environments were cited in the literature as the main issue for isolating relevant variables in deductive studies. However, by not considering the influence of contextual factors, many of these studies provided a restricted view of the factors influencing e-learning effectiveness.

Discussing e-learning effectiveness is problematic due to its location within a wide range of competing priorities and discourses across diverse training and education contexts and organisations. These diverse discourses include achieving outcomes or goals relating to socio-economic goals, promoting transformational organisational change, responding to technological change, achieving efficiencies, and selecting appropriate instructional designs, learning theories and pedagogies. Thus, this thesis informs the challenges of the discursive tensions for researchers of e-learning effectiveness.

This chapter has highlighted that there was a gap in researching e-learning effectiveness factors in workplace organisations. The diversity of contextual factors in workplaces is not adequately addressed in the research literature. The relative ease of access to higher education sites, the association of e-learning technologies and pedagogies with social constructivist principles and methods and the competitive requirements of corporations have contributed to this situation. Further, government public services were using e-learning approaches but there was little available research from this sector in the public domain.

This thesis aims to identify factors influencing e-learning effectiveness from multiple perspectives to inform gaps identified in the literature. As this is the first external research into the Australian Army’s e-learning projects, this thesis addresses the gap in knowledge of influences on e-learning effectiveness in this context. The research aim required a research approach that would allow the development of a substantive model that would inform knowledge of e-learning effectiveness factors in other workplace contexts. The research approach adopted in relation to the research aims is presented in Chapter 3.
Chapter 3 Research approach

3.1 Introduction

To inform the gaps in the workplace-based e-learning effectiveness literature identified in Chapter 2, it was appropriate to adopt an exploratory research approach in a workplace with experience in using e-learning. There was no strong applied research or theoretical base to determine useful hypotheses for the study, and in particular, there was no overall theory that provided insights into effective design, delivery, and use of e-learning approaches. Furthermore, there was little evidence of exploratory research that allowed the concerns and experiences of workers in organisations to inform theory or practice. As discussed in Chapter 2, the Australian Army was selected for research, as it is a large, dispersed organisation with about ten years experience in developing and conducting e-learning courses. As there had been no previous external research into the Australian Army’s e-learning, this study would also inform the literature available on e-learning in military contexts.

Since this research involved the co-operation of the Australian Army, it was necessary to gain approval from Training Command Headquarters. Discussions with Army training managers led to support for the research aims and the provision of access to sites and staff needed for an exploratory research approach. The Grounded Theory research approach met the aims of the research and provided the flexibility required to research within this large and dynamic organisation.

Therefore, this chapter:

- discusses the selection of a relevant research approach for the research aims (3.2)
- outlines the Grounded Theory research approach adopted, including data collection and validity and reliability issues (3.3)
- outlines the constant comparative analysis research methods used in this research (3.4)
- presents the data collection sources and methods for each main respondent group and reflections on researching in the organisation (3.5)
- provides a conclusion to the chapter (3.6).
3.2 Selecting the research approach

Selecting a methodology is determined by the nature of the research issues in terms of the ontology and epistemology that can best answer the research question (Guber & Lincoln 1994). The two research questions for this study (section 3.4.1) were:

- What factors influence effective e-learning in the Australian Army?
- How does an understanding of these factors inform the development of a model of e-learning effectiveness?

The research questions required more than a description of what was going on with e-learning in the organisation or the measurement of e-learning outcomes. The research approach would need to identify and explain the issues confronting respondents involved in e-learning. Furthermore, the research aims required that theoretical categories could emerge from the research to inform the development of model based on the respondent concerns.

The epistemology or ‘the relationship between the inquirer and the known’ (Denzin & Lincoln 2005, p. 22), is interpretivist as the aim of this study is to gain an understanding of the perceptions of those involved in e-learning. The ontology or ‘nature of the reality of the situation’ (Denzin & Lincoln 2005, p. 22), selected for this study is constructivist as the aim of the study is also to understand the issues for people experiencing e-learning in their terms. This approach is different to a positivist approach, which would attempt to find the ‘real’ world through pre-determined measurements and by testing or proving theories, without acknowledging the role and importance of the players and the social context. Constructivist research perspectives do not preclude determining the characteristics or ‘facts’ of the situation. However, there is acknowledgement of the role of the social context in understanding what is happening and the meaning that individuals associate with these factors.

3.2.1 Addressing the research questions

The research questions required a methodology that would identify factors influencing e-learning effectiveness and the relationships between them. There was a need to understand the issues and processes involved in the situation to inform practice and the development of a model. An established inductive methodology used in social science research is
Grounded Theory. Glaser and Strauss (1967) described Grounded Theory as an approach that allows emergence of theory from data systematically obtained and analysed in social research through an inductive, constant comparative approach of data from a variety of sources. Charmaz (2005, p. 508) took a social constructionist approach to using Grounded Theory and supports its use in social research as it ‘encourages researchers to remain close to their studied worlds and to develop an integrated set of theoretical concepts from their empirical materials that not only synthesize and interpret them but also show processual relationships’. Thus, a Grounded Theory approach was appropriate for answering the empirical and theoretical aspects of the research questions.

It has been further argued that the inductive processes involved in generating theory from social research positively influence the usefulness of the theory: ‘Much of the popularity of Grounded Theory to sociologists and layman alike is that it deals with what is actually going on, not what ought to go on’ (Glaser 1978, p. 14). Glaser and Strauss (1967, pp. 3-4) argued that to ‘fit’ and ‘work’ for the research context the theory needs to be able to predict what will work, explain what is needed and be relevant to the research situation. Similarly, Dick (2000, e.p) argued that the relevance feature of Grounded Theory helps those involved to ‘make sense of their experience and to mange the situation better’. Grounded Theory is an established research method that seeks to develop theory that is grounded in respondents’ experiences, which was a requirement of the research aims. The relevance feature of the Grounded Theory approach also assisted in meeting the Army’s request for recommendations for the improvement of its e-learning effectiveness.

### 3.3 Grounded Theory

Grounded Theory was developed in the 1950s and 1960s as a response to the logico-deductive social research, which emphasised theory testing rather than the process of theory generation. Kinach (1995) describes how Grounded Theory was a reaction to positivist trends in social research. There was a need to move towards a more humanist approach that focused on data collection based on the beliefs and concerns of the respondents, with the aim to find theory that was more related to the problems of practice. Glaser and Strauss (1967, p. 10) were concerned that the ‘great-man theories’ of the era were inadequate to explain all areas of social life. Consequently, Grounded Theory has been used in social science studies since the late 1960s.
However, as discussed in Chapter 2, there was very little evidence of Grounded Theory approaches used in e-learning effectiveness research. A broader search for Grounded Theory based studies of e-learning in general, in library databases (ERIC, Proquest, ISI Web of Knowledge, Emerald, and VOCED) and a Web search, also found that Grounded Theory was not commonly used. There were only few Grounded Theory studies located that looked at various aspects of e-learning, including faculty strategies for distance learning (Armstrong 1998), learning management systems at Bell Canada (Jobert-Egou 2003) and experiences of older women learning computer skills (Cook 2003). The studies that were located are mostly thesis research, indicating a need to understand the usefulness of Grounded Theory for practitioners. Therefore, the usefulness of a Grounded Theory approach for practitioners and researchers to assist in understanding the effectiveness of e-learning approaches needed to be investigated.

As e-learning involves the use of new technology systems within the social context of the organisation, there are parallels with information systems research. Information systems research increasingly used Grounded Theory during the 1990s (Lehmann 2000) and it use has formed the basis of recent research into workplace management and information systems (Douglas 2003; Fernandez 2004; Jones & Kriflik 2006; Lings & Lundell 2005), including leadership in a military context (Larsson et al. 2005). These studies recognised that a socio-technical approach was relevant due to the ‘situated nature’ of information systems development and the importance of the ‘social context of systems development’ (Lehmann 2000, e.p). Therefore, understanding the benefits of using Grounded Theory in workplace information systems research can inform e-learning effectiveness research.

These workplace studies recognise the complexity and dynamic interactions of processes within organisations and the value in using an inductive approach that is ‘grounded in reality situations’ (Douglas 2003, p. 51). Fernandez (2004; 2002) has extensively explored and reviewed the use of Grounded Theory for information systems research. He promotes understanding of its demands and advantages for researchers with the conclusion that: ‘grounded theory can produce clear, logical and parsimonious theory that fulfils the canons of good science and simultaneously can be used in Information Systems practice to explain and predict phenomena in this environment’ (Fernandez 2004, p. 58).
There were gaps identified in the e-learning effectiveness research in understanding the influence of social contexts through the concerns and actions of stakeholders (Chapter 2). While researchers have adopted Grounded Theory approaches to provide understanding of the context and complexity of factors in information systems workplace-based research, the role of Grounded Theory in e-learning research is not well established. Therefore, this study informs the use of Grounded Theory for e-learning effectiveness research. Furthermore, it is argued that Grounded Theory principles can inform an approach to understanding influences on e-learning effectiveness that is useful for practitioners and researchers (Chapter 9).

### 3.3.1 Glaser or Strauss?

Grounded Theory has developed into two main approaches; that based on Glaser’s interpretation (Glaser 1978, 1992, 2001, 2004; Glaser & Strauss 1967) and that of Strauss (Strauss & Corbin 1990). Strauss and Glaser came from different research backgrounds and collaborated in the early 1960s to produce the ‘constant comparative method’ that came to be known as Grounded Theory, and then continued to develop the method independently of each other (Fernandez 2004, p. 45).

Strauss and Corbin (1990) proposed a less inductive, more structured approach. For example, Strauss and Corbin encouraged the use of predetermined interview questions that tend to be orientated toward action and process. They argued that their techniques and procedures ‘meet the criteria for doing “good science”: significance, theory-observation compatibility, generalizability, reproducibility, precision, rigor, and verification’ (Strauss & Corbin 1990, pp. 31-2). Glaser (1992, p. 4) argued that Strauss and Corbin’s’ approach ‘forces’ the development of theory through the use of ‘preconceived, substantive questions’ rather than allowing the theory to emerge from what is relevant to the respondents. Glaser’s approach allows for more emergent theory development by relying on what is important to the respondents, without pre-determined constructs in the collection and treatment of data.

While Strauss and Corbin provide a structured and step-by-step approach to data collection and analysis, Glaser also provides a systematic approach for using iterative processes of data collection, analysis and hypothesis generation to ensure the research rigour (Glaser 1978, 1992; Glaser & Strauss 1967). Glaser’s approach, which is more
inductive and based on respondents’ concerns, was appropriate to meet the exploratory aims of the study. Thus, the Grounded Theory approach presented by Glaser was selected as appropriate to satisfy the study’s empirical and theoretical research aims.

3.3.2 Validity and reliability

Moving from deductive ‘scientific’ approaches, to using inductive, humanistic approaches also required a shift in thinking about validity and reliability. Glaser (2004) acknowledges that there are different values that can be placed on the reliability of data and that ‘we are all stuck with a “human” view of what is going on and hazy concepts and descriptions about it’. However, he argued that despite inevitable ‘perception of perception’, Grounded Theory procedures provide research validity and ‘sharpen the generated concepts systematically’ (p.12). Other researchers have supported the rigour and relevance aspects of Grounded Theory from their experience of using it in workplace-based research (Douglas 2003; Fernandez, Lehman & Underwood 2002; Lehmann 2000; Orlikowski 1993).

As Glaser and Strauss (1967) argued, replication is the agreed best means amongst sociologists for validating facts. The validity and reliability of the findings in Grounded Theory are based on the ‘constant comparative method’ (Glaser & Strauss 1967). This method forces the researcher to consider a diversity of data by comparing the data from a variety of sources with the emerging theoretical categories, which ‘enables the generation of theory through systematic and explicit coding and analytical procedures’ (Glaser 2004, p. 15). The constant comparative method is supported by ‘theoretical sampling’, where ‘the process of data collection is controlled by the emerging theory, whether substantive or formal’ (Glaser 2004, p. 14).

Therefore, the principles and methods of the Grounded Theory approach provide a systematic analytical approach, which fulfils the requirements of validity and reliability. Internal validity is supported in Grounded Theory by the researcher using the emerging theory to guide them to the next group, or sub-groups, for data collection. Triangulation of data collection and analysis is built into the research design (Glaser 1992; Glaser & Strauss 1967). The validity of the research is improved by systematically comparing sources of data and allowing the emerging theory to guide data collection. By seeking respondents who may provide different perspectives based on the respondents’
suggestions and the emerging themes, a Grounded Theory approach encourages research validity.

To maintain the reliability of the study, it was important to establish a process for documenting the data collected and the theoretical analysis. The Grounded Theory approach encourages the systematic comparison of data and theoretical concepts and the recording of these decisions in memos. A centralised record was kept of all the data collected, including transcripts and notes of interviews and observations, questionnaire results, internal documents, phone conversations and emails together with the generated codes and my memos. Therefore, the reliability of the research was improved by maintaining a database of data collected and recording the analytical processes undertaken, which formed a ‘chain of evidence’ (Yin 1994).

3.3.3 Using QSR*Nudist

Documentation of the research was assisted by storing much of the data, either as internal or external documents in the software QSR*Nudist (QSR International 2003). I had previously used this software to assist in managing research projects, including some Grounded Theory approaches. This experience indicated that using the software improved the ability to collect, compare and make memos to assist in analysing data. Glaser (1998, pp. 185-6) warns of the ‘technological traps’ of data analysis tools, like QSR*Nudist, as they can simplify the constant comparative method, provide ‘an easy cop out on the full power of memoing’ and impose time-consuming learning curves. However, other Grounded Theory researchers have analysed and discussed data analysis tools use, and found that they assist to explore and compare incidents and to write and store memos (Fernandez 2003; Kelle 1997; Rouse & Martin 1994).

QSR*Nudist provided the advantage of flexibility to document and sort the data to develop codes and categories for theoretical development. Hand-written notes were made in the field and a notebook was used to write up any thoughts when I was away from the computer. Sketching mind-maps of concept relationships and theory development by hand was also useful and fed into the analysis. However, by recording the content and the development of ideas in QSR*Nudist, it was possible to constantly compare the data, write more memos, and develop and modify codes. The program’s search tool was used to
locate particular ideas and to understand some of the relationships between incidents and codes.

For a large project with many data sources, computer-assisted software can facilitate the reliability of using Grounded Theory processes. Nevertheless, when using data analysis tools it remains important to understand the principles of Grounded Theory and to know how to use the program features effectively to support the reliability of this approach (Fernandez 2004; Rouse & Martin 1994).

3.3.4 Dealing with pre-understanding

Pre-understanding from reading and experience does influence what the researcher brings to a research situation. However, there is a difference between pre-determining the design and focus of the research with this understanding in mind, and using previous understanding and experiences to assist in providing insights to the analysis. This difference is not a matter of keeping yourself ‘ignorant’ as claimed by Selden (2005, p. 124), but rather to understand the importance of the research context; ‘to discover what is going on, rather than assuming what should be going on’ (Glaser 1978, p. 159). From an overview of Grounded Theory literature and experience with Grounded Theory studies, Fernandez, Lehman & Underwood (2002) provide a discussion of the rigour and relevance features of Grounded Theory for information systems research. The advantages discussed included ‘a method to deal with bias and preconceptions’, ‘a systematic approach that takes into consideration extant theory but is not driven by it’, it ‘values professional experience’ and it ‘helps practitioners to better understand their own environment’ (p. 116). Thus, understanding the place of pre-understanding in inductive research informs the use of Grounded Theory processes.

Taking a constructivist approach encouraged reflection of the social context of the research and my role in that process, accepting the possible bias that entails for research. I acknowledge that I brought into the research situation my previous knowledge and experiences. While I had experience using and researching e-learning in higher education settings and researching e-learning in a workplace setting, I had very little knowledge of the military context. While Charmaz (2005, p. 510) argues that ‘no analysis is neutral’, her claim that in Grounded Theory research, the ‘researcher’s unfolding interests shape the content of this activity, not the method’ (Charmaz 2005, p. 511) is not valid. The constant
comparative method driving the data and analysis processes encourages the researcher to focus on the concerns that are emerging as important for the respondents. Therefore, the Grounded Theory approach is an established research method in the social sciences and provides a rigorous approach to data collection and analysis that is relevant to the aims of this study.

3.3.5 Grounded theory and case studies

As part of the delimitation of field data collection, the Australian Army was explored as a single research site. By seeking and comparatively analysing accounts, actions and other data in this organisation it was possible to construct a conceptual account that explains what is occurring in this e-learning context. Researching in one organisation also raised the issue of the transferability of the generated model to other contexts.

While Glaser does not directly discuss the issue of researching in a single organisation, he does encourage the researcher to seek maximum difference between comparative groups. He argues that as the Grounded Theory approach focuses on the ‘properties of a process’ and not on the ‘properties of a unit’ (such as a person, group or organisation), then the theory generated is ‘abstract of time, place and people’ and therefore, has ‘enduring grab’ (Glaser 2001, p. 10). Thus, gaining the perspectives of a cross-section of stakeholders is necessary to inform the development of the substantive model.

Other researchers have considered doing case study research using Grounded Theory approaches (Eisenhardt 1989; Fernandez 2004). Eisenhardt (1989) discussed the value of using the Grounded Theory approach in case study research in workplaces and highlighted the value of the relevance factor, due to ‘the intimate interaction with actual evidence often produces theory which closely mirrors reality’ (p. 547). Case study methodology has been more associated with a positivist approach, testing pre-determined theories or providing in-depth description (Yin 1994) rather than building theory. While there are elements of a single case study research in this study, a case study methodology was not used.

3.3.6 Data sources

The Grounded Theory researcher can consider any source of data and data collection method that is relevant to the theory development (Glaser 2004; 1967). While qualitative
data and interviews are popular, Glaser argued that ‘all is data’. Therefore, I approached the field with the Grounded Theory perspective that anything that I saw, heard or read could be useful data. I was also open to any invitations to visit sites, observe and participate in e-learning classes, attend formal feedback sessions or opportunities for informal chats with respondents. Alternatively, I was also expecting restrictions of access to data sources in the Army due to security and operational requirements. I was flexible in using different data collection methods depending on the access provided to particular respondents. The focus was on gaining access to a cross-section of data sources that would inform the emerging theoretical concepts.

### 3.3.7 Theoretical sampling

To select the respondents, Glaser and Strauss (1967) describe the process of ‘theoretical sampling’. This process selects comparison groups based on their theoretical relevance for possible further development of emerging categories and their properties. The researcher ‘chooses any groups that will help generate, to the fullest extent, as many properties of the category as possible, and that will help relate categories to each other and to their properties’ (p. 49). Theoretical sampling forms the basis for structuring the data collection process: the ‘where next in collecting data, the for what according to the codes, and the why from the analysis in memos’ [emphasis on original] (p. 47). Furthermore, theoretical sampling is not based on statistical sampling. To use theoretical sampling, the researcher ‘searches for maximum differences among comparative groups in order to compare them on the basis of as many relevant diversities and similarities in the data as he can find’ (p. 56). Thus, the theoretical sampling process involves selecting respondents based on the theoretical concepts emerging from the study, not from a pre-determined representative sampling procedures or attempts to get the fullest data on a particular group.

While it was anticipated that collecting across the various activities associated with e-learning in the Army would probably be important, no pre-determined sampling ideas or limitations to data collection were made prior to entering the field. Glaser suggests that based on local concepts the researcher should make initial contact with groups that it is believed will ‘maximize the possibilities of obtaining data and leads for more data on their question’ (Glaser 1978, p. 45). In the case of the Army, it was very clear from the initial
meeting that in this hierarchical organisation it would be important to make contact with e-learning managers. It was also expected that there could be some limitations in accessing data collection across various roles and positions in the organisation, which could influence theoretical sampling. Therefore, by making initial contact with the managers, it was possible to establish processes for communicating and working within the organisation for the period of the research.

### 3.3.8 Constant comparative analysis

The ‘constant comparative method’ enables the generation of theory through iterative and systematic processes of data collection, coding and analysis. Glaser (2004, p. 15) summarised this method as three types of comparison:

- ‘Incidents are compared to incidents to establish underlying uniformity and its varying conditions. The uniformity and the conditions become generated concepts and hypotheses.’
- ‘Concepts are compared to more incidents to generate new theoretical properties of the concept and more hypotheses’. This process provides ‘densification of concepts by developing their properties and generation of further concepts.’
- ‘Concepts are compared to concepts.’ These concepts and conceptual levels are integrated into hypotheses between the concepts that become the theory.

Thus, the focus was on comparing sources of views and experiences of e-learning to generate theoretical concepts that were compared to inform more data collection and theoretical generation.

Once the core concern for the respondents starts to become clear, this informs the development of the ‘core category’. Subsequently, there can be a focus in the data collection and analysis on this core category and its properties. The data collection becomes more focused on ‘minimizing differences in comparative groups’ (Glaser & Strauss 1967, p. 57). This methodology encourages a focus on the main concern of the respondents and the interrelationships between the issues and actions in the setting. The constant comparative method informed the development of the main data analysis chapters of this thesis in Chapters 4, 5, 6 and 7 and development of the substantive model presented in Chapter 8. The Grounded Theory comparative processes used in this study are outlined in Figure 3.1.
3.3.9 Convergent interviewing

Dick (1998) described the convergent interviewing approach, which has considerable parallels to Grounded Theory:

As with Grounded Theory, the explanations emerge gradually from the data as the study proceeds. All interviews begin open-ended. In the later interviews, there are more probe questions. And more of those probes are specific. The theory emerges from the data, from the informants. In the early stages it consists primarily of themes. These become more elaborated as the study develops (Dick 1998, e.p).

Convergent interviewing allows the content to be unstructured but it provides a structured approach to the interview (Figure 3.2). That is, predetermined questions are not used, but questions emerge through constant comparative analysis of the data. It supports an inductive, grounded approach by seeking disconfirmation and possible explanations of this disconfirmation to gain a better understanding of people’s attitudes and beliefs. These processes parallel the constant comparative method of Grounded Theory, reinforcing the validity of the data collected.
Glaser (2004, p. 8) offered a caution from his observation of how theoretical sampling is interpreted by some researchers as ‘seeking negative cases’. The direction to ‘seek exceptions’ in Dick’s model could be interpreted this way. However, I interpreted Dick’s model as being firmly grounded to allow theory to emerge from the data collection, based on theoretical sampling principles. The focus should be on seeking diverse groups of respondents and explanations for any differences in the incidents to assist in improving understanding of the respondents’ concerns and actions, which informed the developing model.

### 3.3.10 Theory generation

To generate a set of categories from the data that fit, work and can be integrated into theory, Glaser (1978) described the process of iterative cycles of comparative data collection and developing conceptual codes. These codes represent the essential relationship between the data and the theory and conceptualise the patterns of incidents and their relationships to the grounded theory. ‘Coding gets the analyst off the empirical level by fracturing the data, then conceptually grouping it in codes that then become the theory that explains what is happening in the data’ (Glaser & Strauss 1967, p. 55). Therefore, the theory is discovered ‘by developing the hypothetical relationships between conceptual codes (categories and their properties)’ (p. 55).

The first stage in approaching the data analysis was ‘open coding’ of the data using the constant comparative method (Glaser 1978; Glaser & Strauss 1967). This process codes the data, without predetermined codes that could limit the emergence of relevant concepts.
or preconceives their relevance. Open coding involves coding the data for as many
categories and their properties as seems relevant, and constantly comparing these codes
and categories by readjusting, and trimming them as determined by the data. Memos are
made of these changes, along with the researcher’s thoughts and insights to assist with the
generation of the theoretical propositions. During the constant comparative process, a core
category begins to emerge, which ‘appears to account for most of the variation around the
concern or problem that is the focus of the study’ (Glaser 2004, p. 15).

Once the core category has emerged, ‘selective coding’, by focuses on coding the data to a
central concept, assists with further theory development. By focusing on the core category
and its properties, subsequent data collection and coding is ‘delimited to that which is
relevant to the emerging conceptual framework’ (Glaser 2004, p. 16). The researcher can
then delimit and refine the categories based on the underlying uniformity and can
reformulate the theory with fewer higher-level categories. This process continues until the
data is not providing any new insights into the development of the categories, including
the core category. That is, ‘theoretical saturation’ has been reached. Further details and
eamples of the application of the coding processes in the study are provided in Chapter 4.

Once the theoretical concepts have emerged from the field-based data, Glaser and Strauss
(1967) proposed that by comparing groups and data outside the initial scope of the
research (e.g. different organisations, regions, nations), the researcher can gain more
insight into the generation of the model’s theoretical concepts. The aim of comparing the
model outside of the original setting is not to reject the model, but to inform further
development of the emerging model. This approach was adopted to compare the
substantive model developed from the Army’s experience to some empirical studies of e-
learning use in workplaces (Chapter 8)

Therefore, the Grounded Theory approach provides a clear rationale and systematic
research processes that focus on gaining respondents’ concerns within their social context
to inform the development of a model. This approach is appropriate to fulfil the aims of
the study.
3.4 Research processes used in this study

As there were ongoing cycles of data collection and analysis (Figure 3.3), the research steps undertaken were not linear. However, there are identifiable stages in the research that reflect both the methodology and practical considerations.

<table>
<thead>
<tr>
<th>Step</th>
<th>Activity</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entering the field</td>
<td>Initial contact with Army training managers</td>
<td>Familiarised researcher with the research area</td>
</tr>
<tr>
<td>Emergent research questions</td>
<td>Discussions about research focus and research questions</td>
<td>Started with issues grounded in the research area</td>
</tr>
<tr>
<td></td>
<td>Establishing conditions of research</td>
<td>Focused effort without predefining</td>
</tr>
<tr>
<td></td>
<td>Negotiating initial access to Army sites</td>
<td></td>
</tr>
<tr>
<td>Critiquing background literature</td>
<td>Located e-learning effectiveness literature</td>
<td>Familiarisation with type of research being undertaken</td>
</tr>
<tr>
<td>Emergent research questions</td>
<td>Literature collection and review continued throughout the research processes based on emerging findings</td>
<td></td>
</tr>
<tr>
<td>Data analysis</td>
<td>Substantive coding of initial discussions</td>
<td>Gained initial overview of respondents' concerns</td>
</tr>
<tr>
<td>Data collection</td>
<td>Continuing rounds of data collection with different groups of respondents</td>
<td>Constant comparison and understanding of emerging trends</td>
</tr>
<tr>
<td>Data analysis</td>
<td>Continuing rounds of substantive coding of interviews and writing memos</td>
<td>Development of substantive themes</td>
</tr>
<tr>
<td></td>
<td>Main concern of respondents and related themes emerged</td>
<td>Improved internal validity</td>
</tr>
<tr>
<td></td>
<td>Located e-learning effectiveness literature</td>
<td></td>
</tr>
<tr>
<td>Data collection</td>
<td>Literature collection and review continued throughout the research processes based on emerging findings</td>
<td></td>
</tr>
<tr>
<td>Data analysis</td>
<td>More focused field-based data collection and memo writing based on emerging conceptual themes</td>
<td>Improved internal concept validity</td>
</tr>
<tr>
<td></td>
<td>More focused analysis based on constant comparison to develop conceptual coding</td>
<td>Helped to enrich the theoretical content of the substantive model</td>
</tr>
<tr>
<td>Reaching closure</td>
<td>Reaching theoretical saturation</td>
<td>End process when marginal additions to theory development became small</td>
</tr>
<tr>
<td>Comparison with relevant case study literature</td>
<td>Comparing grounded theory themes with case study literature</td>
<td>Helped to provide insights into the model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improved construct definition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raised theoretical level</td>
</tr>
<tr>
<td>Closure</td>
<td>Refinement of Grounded Theory Comparison with relevant theoretical literature</td>
<td>Raising the theoretical level of the model</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building on existing knowledge</td>
</tr>
</tbody>
</table>

Figure 3.3 The main research steps used in this study using a Grounded Theory approach

3.4.1 Entering the field

As outlined in Chapters 1 and 2, the Australian Army is a workplace site with over ten years experience of e-learning design, development and use. I had no previous knowledge of the Army or the military and had only very limited knowledge, from a conference presentation, of their e-learning products. Initial contact with Army’s TTC staff members led to a meeting at the Centre in Sydney between two senior TTC staff, a Training Command Senior Officer, my supervisor and me. When the TTC was approached about researching their e-learning projects, they were amenable to discussing the options and opportunities of external, independent research. To assist in my understanding of the
TTC’s role, the staff showed promotional videos of its function within the Training Command, demonstrated a sample of e-learning products, and they provided a guided tour of the TTC design and development area. This orientation session provided background information about the e-learning projects and an overview of the hierarchical organisational structure. The notes from this meeting informed the initial data for the study and I could start to reflect on the issues and concerns that were being raised.

3.4.2 Emergent research questions

Glaser (1992) recommended that the initial research questions for any study should be emergent, either from the initial interviews with the respondents or from the technical or background literature. The Army staff indicated an interest in understanding the influences on effective e-learning outcomes, and the background literature review indicated gaps in the workplace-based literature. Establishing some mutual interests for the PhD research and the organisation facilitated my access to researching the Army’s e-learning projects.

The initial meeting with Army training managers included my presentation of the proposed aims of this study. The Army staff members were supportive of external, independent research of the e-learning program. The TTC staff considered that they were ‘good at developing and design’ (Manager interview) and that they were particularly interested in understanding the factors that were influencing e-learning effectiveness. They discussed a range of issues and gaps in their knowledge relating to e-learning, including managing distance learning, introducing new technologies, trainee motivation, gender differences in training, trainee learning strategies, trainee characteristics, effective learning theories and methods of evaluation. I understood that there was already an organisational commitment to e-learning use and there was interest in the understanding of factors that could further improve e-learning effectiveness.

The staff indicated that most of the Army’s training evaluation research involves measuring learning outcomes, weekly trainee feedback questionnaires, and end-of-course focus groups with instructors and trainees. I explained at the meeting that I have undertaken research using stakeholder perspectives, which had been effective to understand the organisational and learning contexts. There was support at the meeting for the use of exploratory research to provide more depth of understanding of the issues.
influencing e-learning. Subsequently, the Army staff supported this research as an exploratory study to inform further internal and external research into e-learning effectiveness factors.

It was clear from the meeting that undertaking this research required the submission of formal research proposals for approval through the Army’s chain of command. After further discussions, based on a series of research proposals submitted to the TTC over the following few months, there was official approval from Headquarters Training Command-Army. This approval was for an exploratory study into the factors influencing e-learning effectiveness in the Army from the soldiers’ perspective, including the provision of practical recommendations. Therefore, the research questions emerged from a review of the background literature and from the discussions and agreement with the Army. The Grounded Theory approach required the consideration of the themes emerging from the constant comparative analysis and seeking data sources based on the developing theoretical categories.

### 3.4.3 Data collection

Due to Army operational and training requirements, data collection needs to be opportunistic, in terms of the data sources and data collection methods that are available. Glaser and Strauss (1967) recognised the difficulties of doing field-based research and recommended an ‘openness of inquiry’ (p. 65), so that the researcher is flexible in the data collection methods used in response to the variations of situation from group to group. The resulting data collection is ‘slices of data’ (p. 66) from different types of data, and from different data collection methods (including qualitative and quantitative methods), to respond to the situation.

There were operational and security requirements set by the Army to access data and university ethical requirements to consider (section 1.6). While it was continually necessary to negotiate access to data over the two-year research period, this process became easier as the Army managers became more aware of the study and provided access training centres and staff. An Army appointed Point of Contact (POC) acted as a facilitator to negotiate access to respondents and information in this usually closed organisation. Reflecting the constant movement of staff in the organisation, there were three POCs.
appointed over the period of this study. The Army provided invitations to visit sites and opportunities to observe and participate in e-learning classes, which were accepted. Another source of data was the POC’s regular phone and email contacts, which also provided valuable insights into what was happening in the e-learning courses. While it was evident that open access to soldiers or information may not have been possible, any difficulties in data collection would also inform the study. Using a Grounded Theory approach allowed the complexities of the research situation to become a part of the data collection and analysis processes.

It was difficult to determine how long would be needed to have access to the site to collect data, which was an issue in terms of developing the formal research proposals required by the Army. It was understood that building trust and support for the research project with the Army was important to encourage data access. Glaser and Strauss (1967, p. 74) recognised that this temporal aspect can be an issue for Grounded Theory studies, particularly those involved with outside bodies. They recommend that the goal of the delimitations of the research should be determined in terms of the type of theory (either substantive or formal) and the range of the groups and geographic areas to be covered, in order to maximise the efficiency of the study in terms of effort and outcomes. As the Army is a large and dispersed workplace, an aim was to gain access to a wide cross-section of respondents involved in the Army’s e-learning activities across Australia, allowing for a data collection period of about two years. While this was a broad delimiter, it was necessary to include any regional diversity in perspectives or experiences to inform the development of the substantive model.

It was expected that the two-year data collection period, would facilitate access to a wide range of respondent groups across Australia and provide a longitudinal aspect to the research. However, Army project planning requirements and proposed structural changes within its e-learning sector in June 2005, with increasingly limited face-to-face access to staff after this date, meant that the main data collection period went for about eighteen months. By June 2005, sufficient data had been collected and analysed in terms of reaching theoretical saturation.

There was some discussion at the initial TTC meeting, and later with the POC, about the focus of the data collection. Initially a broad range of e-learning courses were proposed by
the Army, including the Subject 1 CPL course, a Grade 2 course for officers, the Subject One Sergeant course and various stand alone courses, such as navigation, first aid and the Steyr weapons courses. However, it emerged from these discussions that the Subject 1 CPL course was the longest running e-learning course (since 2000) and that the Army valued the course as the initial all-corp promotion course. As the Subject 1 CPL course is run regularly throughout the year at all of the RTCs, it was thought that this timetabling would provide good opportunities for me to access personnel. Therefore, this study focused predominantly on respondents involved with the Subject 1 CPL course. Initial meetings with Army staff members to arrange this study commenced in August 2003 with the majority of the data collection occurring from December 2003 to October 2005 (Figure 3.4).

<table>
<thead>
<tr>
<th>Data collection</th>
<th>Date</th>
<th>Number and types of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Respondents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1a. Training Managers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior Army training managers</td>
<td>Aug 03</td>
<td>Initial discussions of project with 3 staff members</td>
</tr>
<tr>
<td>HQ TC-A: Past Major General Commanding Headquarters Training Command</td>
<td>Dec 03</td>
<td>1 f2f* interviews</td>
</tr>
<tr>
<td>RTCs: Commandant RTC</td>
<td></td>
<td>2 f2f interviews</td>
</tr>
<tr>
<td>Deputy Commandant RTC</td>
<td></td>
<td>1 f2f interview</td>
</tr>
<tr>
<td>HQ TTC: Past Commandant TTC</td>
<td>Oct 03</td>
<td>1 f2f interview</td>
</tr>
<tr>
<td>Current Commandant TTC</td>
<td></td>
<td>1 f2f interview</td>
</tr>
<tr>
<td>Current Manager TTC</td>
<td>Aug 03 Oct 03 Feb 04 Mar 05</td>
<td>4 f2f interviews Feedback on submissions and project proposal</td>
</tr>
<tr>
<td>Discussions of project with 3 TTC Army Liaison Officers</td>
<td>2004-2005</td>
<td>Regular f2f, phone and email contact and discussions</td>
</tr>
<tr>
<td>1b. Instructional Designers and Course Developers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTC: Instructional designers, course designers and developers</td>
<td>Feb 04</td>
<td>10 f2f interviews</td>
</tr>
<tr>
<td>TTC: Instructional designers, course designers and developers</td>
<td>Mar 05</td>
<td>12 f2f interviews</td>
</tr>
<tr>
<td>1c. Instructors: Sub 1 CPL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTC SE Qld: Instructors</td>
<td>May 04</td>
<td>12 f2f interviews</td>
</tr>
<tr>
<td>RTC SE Qld: Evaluations officer</td>
<td>May 04 Nov 04</td>
<td>2 f2f interview</td>
</tr>
<tr>
<td>RTC SE Qld: IT support staff</td>
<td>May 04</td>
<td>1 f2f interview</td>
</tr>
<tr>
<td>RTC Vic: Instructors</td>
<td>Jun 04</td>
<td>9 f2f interviews</td>
</tr>
<tr>
<td>RTC Instructors (NE Qld, NSW, SA, SE Qld, Tas, Vic, WA)</td>
<td>Sept-Oct 05</td>
<td>15 phone interviews</td>
</tr>
<tr>
<td>1d. Instructors: Grade 2 pilot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructors involved in pilot distance e-learning Grade 2 course</td>
<td>Mar 05</td>
<td>Post course questionnaire - 7 respondents</td>
</tr>
<tr>
<td>1e. Students: Sub 1 CPL Active Reserve distance e-learning pilot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Data collection

<table>
<thead>
<tr>
<th>Data collection</th>
<th>Date</th>
<th>Number and types of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTC: Distance Learning Reserve training orientation session</td>
<td>July 04</td>
<td>Participation in orientation session Pre-course questionnaire - 16 respondents 3 rounds of phone interviews during e-learning period - 31 phone interviews Participation in end of course focus group session</td>
</tr>
<tr>
<td>Distance Learning Reserve Trainees</td>
<td>Aug 04, Sept 04, Oct 04</td>
<td></td>
</tr>
<tr>
<td>RTC: Distance Learning Trainees and instructors forum</td>
<td>Nov 04</td>
<td></td>
</tr>
</tbody>
</table>

### 1. Students: Subj 1 CPL Regular soldiers

<table>
<thead>
<tr>
<th>RTC: Regular Soldier Trainees</th>
<th>Date</th>
<th>Number and types of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sept 04</td>
<td>Pre-course trainee questionnaire - 54 respondents</td>
</tr>
</tbody>
</table>

Details of data collection from respondents and other sources for this study (cont’d next page)

<table>
<thead>
<tr>
<th>RTC: Regular Soldier Trainees</th>
<th>Date</th>
<th>Number and types of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oct 04</td>
<td>Post course questionnaire - 48 respondents. Participation in post-course focus group session</td>
</tr>
</tbody>
</table>

### 2. Other data sources

#### 2a. Internal documentation

- Analysis of historical CBL documents (TECHSIM), including reports and correspondence: 2003 Background literature review and data
- Internal policy reports from Army Training Command: 2003-2005 Current policy information influencing e-learning

#### 2b. Field observations

- Army Education Corps trainee class orientation to e-learning: Aug 03 Class observation Interview with instructor
- Participation in Army Distance Learning Directing Supervisors’ Planning meeting: May 04 Observation and feedback provided
- Participation and observation of Reservist e-learning orientation class

#### 2c. Army communications

- POC discussions: 2004-2005 Ongoing contact by email and phone about project progress and to negotiate data access
- Submissions of research proposal submissions to TTC: Oct 04-Mar 05 Ongoing submissions, feedback and review of research proposal
- Interim progress reports submitted to TTC: May 04-Apr 05 Provided written Interim Reports to TTC on research results Received feedback
- Final Report to Army Training Command “The soldier’s perspective of flexible learning”: May 05 Provided extensive written formal report on research to date, with recommendations Satisfied conditions of funding Received feedback on Report

#### 2d. Refereed papers

- Nine refereed conference papers and journal articles written on findings: 2004-2006 Consolidated research Provided peer-reviewed feedback Received feedback from POC and TTC manager

*f2f: face-to-face*

*Figure 3.4 Details of data collection from respondents and other sources for this study*

Data was collected primarily from interviews including face-to-face interviews and phone interviews with the aim of collecting in-depth understanding of the respondents’ concerns and actions. Open-ended interviews were preferred in order to obtain rich, in-depth data but there was also awareness that use of other qualitative or quantitative data collection methods could be used in providing data in a Grounded Theory study. Face-to-face
interviews were arranged at the training centres, where possible. These interviews assisted
in establishing good communications with the respondents. However, due to operational
and training time restrictions, it was necessary to arrange phone interviews for some of the
instructor interviews and for the distance learning Reserve soldier interviews. It was
possible to gain details from these respondents over the phone, although communication
was more difficult in some cases. In cases where it was difficult to understand the
respondent, respondents were asked for their permission to tape the conversation using a
speakerphone. Even when they agreed to this, I still took notes of the main issues as they
were speaking, which enabled me to keep track of the main issues being raised in the
interview.

In total, 101 interviews were undertaken; 55 face-to-face interviews and 46 phone
interviews. Other data was collected from questionnaires (129 respondents), internal
policy and documents, Army run trainee focus groups, personal communications with the
POC (e.g. emails, phone conversations), written and verbal feedback on interim research
reports, and observation and participation in e-learning classes and informal discussions
with soldiers at training session meal breaks. The data collection methods and timing
reflected the need for data to assist with the theoretical development, and the opportunities
provided by the Army and the negotiations by the POC and other staff on my behalf.

Respondents suggested the inclusion of a cross-section of people from different ranks that
highlighted the hierarchical organisational structure. The data collection reflected the
Army’s organisational structure including soldiers through the ranks of Private to Major
General and civilian staff, encompassing Strategic Command, Training Policy, e-learning
production, instructors and trainees, including Regular and Reserve soldiers. While no
attempt was made to make these representative samples, the selection of these respondents
reflected the suggestions of further contacts by the respondents and the emerging
conceptual development.

The security and hierarchical structures of the Army influenced, to some extent, the
freedom to apply the theoretical sampling procedures proposed by Glaser and Strauss
(1967). Operational requirements and changes to training programmes influenced access
to the respondents. The scheduling (and rescheduling) of the e-learning program and the
impact of operational requirements on respondents’ training activities, both influenced the
availability of the respondents, and informed the research. However, despite these limitations, an extensive range of data sources was accessed across the e-learning activities in the organisation. By focusing on the emerging themes to guide the cycles of data collection and analysis, there was confidence that theoretical saturation was reached for the main themes.

Within the tenants of using Grounded Theory, the data collection approach was largely opportunistic and flexible, allowing me to take advantage of unexpected opportunities and to pursue new leads. There was an overall guiding principle to gain access to respondents and other data sources that would assist in further comparisons and the development of the emerging themes and concepts.

3.4.4 Respondent groups

When approaching research in an organisation, the researcher may have a ‘partial framework of local concepts’ (e.g. different roles of staff) that provide a ‘beginning foothold’ on the research (Glaser & Strauss 1967, p. 45). It was evident from the initial visit to the TTC that the Army’s e-learning activities reflected the highly structured, hierarchical organisational functions. There were obvious and well-defined sections responsible for how e-learning was designed, developed, delivered and used, so, gaining the perspectives of respondents from these sections emerged as important for theoretical sampling.

Groups of respondents were defined in terms of their function in relation to e-learning (e.g. instructors, managers, trainees, instructional designers), with the principle of theoretical sampling as the criteria for what groups were included and for what theoretical purpose. However, the aim was not to compare the respondent groups but to compare the similarities and difference in the concerns and concepts emerging from the research to inform theoretical development.

Glaser (1992, p. 4) suggests that when data is being collected and analysed the researcher should be asking two main questions to inform theory development:

- ‘What is the chief concern or problem of the people in the substantive area?’
- ‘What accounts for most of the variation in processing the problem and what category or what property of what category does this incident indicate?’
Therefore, the field was entered with the question in mind: ‘What is the key concern or problem for people involved in the Army’s e-learning?’ This focus enabled me to open discussion with the respondents on their terms and allowed their concerns to inform theory development. It was also important to encourage the respondents to discuss any issues relating to e-learning that were important to them, rather than predetermining the focus of the research. A convergent interviewing method (Dick 1998) was used to establish the main concerns for respondents and to explore these issues in order to inform the emerging substantive codes and theoretical themes.

Face-to-face and phone interviews formed the major part of the data collection method. Face-to-face interviews were arranged with respondents at training centres and workplaces, including two RTCs, the TTC and Headquarters RTC. The face-to-face interviews took about 45 minutes to an hour, with two of the retired senior managers’ interviews taking about two hours. The instructor phone interviews also took about 45 minutes to an hour and the Reservists’ distance learning feedback phone interviews took 20 to 30 minutes, on average. I preferred to take hand written notes of the main issues and to concentrate on what the respondents were saying and showing me. Not taping kept the interviews more informal, which encouraged the respondents to raise issues with me, and for me to be a more active listener. Particularly illustrative quotations were noted verbatim, where possible, to assist in the analysis and presentation of the thesis.

The opening question used for all of the interviews was open, allowing the respondents to raise and discuss any issues that were important to them, ‘What do you think of computer-based learning?’ An additional prompt was asked, if necessary, ‘What are the main advantages or disadvantages?’ The term ‘computer-based learning’ was used in the interview questions, as the Army personnel commonly used this term during the study to describe the Subject 1 CPL modules. The questions became more focused to confirm the main themes and to gain an understanding of the reasons for any differences emerging in the themes. These additional questions were also open-ended, so that they did not inform the respondent of previous perceptions or guide the respondent. This data collection process allowed the constant comparison of the substantive concerns and the development of the theoretical concepts.
3.4.4.1 Managers

In this hierarchical organisation, it was important to understand the managers’ perspective, so the first round of interviews was with current and retired senior training managers. To gain an understanding of the background to the Army’s e-learning, I asked if there were retired managers available who were involved in setting up the e-learning projects. I was able to negotiate through the POC and the TTC manager to gain access to two retired senior Army training managers. These were extended interviews of about two and half hours each. As I wanted to capture the verbal history of the e-learning projects, these interviews were taped, with the respondent’s permission. It was also evident that political issues and confidentiality were issues, and I was asked to turn off the tape at various stages of the interview. I was allowed to continue taking notes of the main issues, which assisted the coding of the interview afterwards. The managers were willing and keen to talk with me about the e-learning activities, and were at times critical of some decisions and reflective of their experiences. It was evident that despite organisational commitment to e-learning implementation, there were individual perceptions of advantages and disadvantages to inform the research. These initial interviews provided many of the initial themes that were explored in further data collection.

The retired managers also indicated that there were Army historical documents that could assist in building an understanding of the issues, and the TTC manager provided access to these documents. These documents were reviewed and the main issues and recommendations were noted for analysis. The retired manager interviews and documents provided the background history to the Army’s e-learning projects up to the beginning of this study, which was summarised in section 2.4.4. This history had not been previously collated or published and was written up as a conference paper as a part of this study (Ellis & Newton 2004).

Further face-to-face interviews were undertaken with current senior training managers, including the TTC manager and the Commander and Deputy Commanders at two RTCs. I found that the managers were willing and keen to talk with me about e-learning activities, and that they were at times critical of decisions and reflective of their experiences. It was evident that despite organisational commitment to e-learning implementation, there were individual perceptions of advantages and disadvantages, which further informed the research.
### 3.4.4.2 Instructional designers and courseware developers

Potential sites and groups of respondents who would be relevant for following up and exploring some of the issues that had been raised were discussed with the POC. Since the managers highlighted the importance of the instructional design of the e-learning packages, access was negotiated for face-to-face interviews with the TTC instructional designers and courseware developers. While the manager was willing for me to interview the staff, accessing the TTC for interviews involved security checks and constant attendance by a staff member in the building. Although the TTC staff members were, in general keen to talk with me, I invited each one to participate and respected their right to refuse an interview, which was not communicated to the manager.

As the respondents were sitting at their work computers, they often showed me examples of their design or development work on the e-learning courses. This provided valuable data, as they were able to discuss and demonstrate a range of issues that were influencing their work, such as technical issues, project management requirements and learner needs. As the TTC employees were working in an open-plan office, some of the respondents moved to closed rooms to discuss issues that were more controversial. Such requests also provided data about the organisational and personal influences on the e-learning development processes.

The instructional designers and course developers were very open to providing their views about e-learning, problems they were experiencing and recommendations for change. Most of the instructional designers and courseware developers employed at the TTC were full-time soldiers with previous experience in the Army, and they were able to reflect on the use of e-learning in relation to these experiences. Some civilian contractors, employed mostly for their specialised multimedia skills, were also employed and were included in the interviews. The contractors were able to reflect on the Army context for e-learning design, from an outsider’s perspective, which provided additional comparative data for the research. It was a valuable research experience for me to be able to observe the structure and communication within the workplace, the technologies being used and the e-learning courses in design and production.
Various concerns that emerged during the first year of data collection relating to course design, which indicated that revisiting the TTC was necessary. Consequently, there were two rounds of interviews done with the TTC course design and development staff and the TTC manager (2004 and 2005). This opportunity provided a longitudinal perspective to the issues and changes experienced in the Army, including the constant shift of staff to different Army sections. About half of the staff from the 2004 interviews had been transferred and replaced by the 2005 interview period. The instructional designers indicated that there were issues with communication between the design and delivery stages of e-learning. In particular, there were issues with instructors who worked with the instructional designers as Subject Matter Experts (SMEs).

### 3.4.4.3 Instructors

Negotiating access to instructors was difficult due to the very tight training schedules. Trainers were active soldiers brought into the RTCs for the residential training sessions. The POC initially arranged for me to visit two RTCs during e-learning periods of residential training. Visiting the RTCs provided me with an excellent opportunity to observe and participate in the e-learning classes, and to become familiar with the day-to-day workings of an Army base. This experience included having lunches with the trainees in the Army canteen and with the managers in the Officers’ dining room, participating in e-learning classes commencing at 7 a.m. and being flexible when training schedules changed with very little notice. I interviewed the instructors at their desks in between their e-learning sessions, which required some flexibility and cooperation with the instructors. However, they were all very willing to speak with me and they seemed to appreciate the open nature of the questions, and the opportunity to provide feedback to an external person.

At the first RTC, the interviews were done privately, one-on-one and at the second RTC, the interviews were arranged in an open-plan office. Although there was occasionally some communication between the instructors during these open-plan interviews, they were encouraged to express their personal perspectives. For the first round of interviews at the two RTCs, all of the instructors involved in e-learning delivery for the Sub 1 CPL course were available and willing to talk with me. The instructors seemed to value me writing down what they were saying and went out of their way to provide comprehensive and thoughtful replies. Therefore, a range of perspectives of the instructors’ experience with e-
learning was gained. Technical support staff members at the RTCs were also interviewed to explore some of the technical issues that had been raised.

As there was evidence of regional differences in instructors’ perspectives and the instructor’s role was emerging as a key factor in the research, attempts were made to expand the instructor interviews to include more RTCs. Many attempts by the POC to arrange more face-to-face interviews failed due to training and operational issues, and it took over a year (June 2004 to October 2005) to gain access to instructors for phone interviews, at a wider range of RTCs. Consequently, phone interviews were undertaken with instructors at seven of the eight RTCs located around Australia. Operational restrictions at one RTC prohibited me from contacting them. I made initial contact with the Senior Instructor (SI) at each RTC who invited, and at times selected, instructors to talk with me. While this process could have resulted in bias in perspectives, it was evident from the interviews that the SI had attempted to provide instructors with a range of experiences and perspectives of e-learning.

The instructors’ interviews provided confirmation and more details of the main concerns and developing themes. The significant time gap in the research with the instructors was fortuitous, as this second round of interviews provided a good opportunity for comparing issues and concepts with a longitudinal perspective. As the other data collection from other respondents had been analysed, it was possible to focus on the theoretical concepts to assist in theory building.

Instructors from one of the RTCs from the first round of interviews in 2004 had been included in the second round in 2005. Some of the instructors, including the SI, were therefore interviewed twice. However, these respondents were able to reflect on changes over the previous year, which added depth to the data collection. By comparing the issues raised and the concepts that had emerged from the data analysis study, it was also possible to develop and refine the substantive and theoretical codes.

An opportunity was provided by the Headquarters RTC to participate in the Army’s trial of a Subject 1 CPL distance-learning pilot for Active Reserve trainees. This trial involved seventeen soldiers and four instructors, who were to support the distance learners. However, despite gaining permission to contact these instructors and many attempts to phone them and email them, it was not possible to interview them. It became evident at the
end of the trial that the original instructors had left about mid-way during the trial due to workload conflicts. Therefore, it was not possible to provide the instructors’ perspective of the distance learning trial. However, the lack of instructor support for the trainees influenced their e-learning experiences.

3.4.4.4 Trainees

The other respondent groups considered gaining the perspective of the trainees was important, but it was also acknowledged as difficult for an external researcher. Managers and instructors considered that trainees are adequately surveyed in the Army’s standard weekly and summative course evaluations, and that course outcomes indicated success rates of the training. Some of the summaries of the Army’s e-learning course evaluations were provided; however, they tended to focus on very specific aspects of individual modules or general satisfaction aspects of the training. Face-to-face interviewing with Regular soldiers was not possible for this study due to the very tight training schedules, with up to fourteen hours a day committed to training sessions during the residential training periods. I also felt that there was some reluctance from within the RTCs to allow me to interview the Regular soldiers. However, details of these training schedules and procedures in relation to e-learning delivery provided further data for the study.

Consequently, it was decided through the POC’s communication with the Commander of an RTC, that I could use pre-course and post-course questionnaires for a group of Regular soldiers in the Subject 1 CPL course in a training session that commenced in September, 2004. The questionnaire session were run in tandem with the Army’s regular course evaluation with the co-operation of the RTC evaluations officer. The development of the questionnaire questions was based on the issues emerging from the research over the previous year, and in collaboration with the POC and evaluation’s officer. The Army feedback was focused on providing correct terminology and avoiding duplication with the Army’s questionnaires.

I addressed the trainees at the e-learning orientation session and distributed the pre-course questionnaires to them in person and the trainees completed the questionnaires overnight. Trainees were encouraged to participate but it was made clear to them that participation was voluntary. The pre-course questionnaire (n=54) had a return rate of 100 percent of the class, which indicated the respondents’ interest (and the influence of an authoritarian
culture). The post-course questionnaire was posted to the Army evaluation office who handed them out to the soldiers during the final session of the training. Of the 48 trainees who attended this session, there was also a 100 percent return rate.

The questionnaires asked Likert-type ranking of statements that had been made about e-learning by previous respondents and statements that had been made in Army documents. There were also open-ended questions asking about their e-learning experiences. The pre-course questionnaire asked about demographics, computer use, Internet tools use, learning strategies, learning styles and perspectives of e-learning. The post-e-learning course questionnaire asked about the e-learning experience, the usefulness of various multi-media aspects of the course, computer skill requirements, time management, learning styles, feedback on content, learning support requirements and perceptions of retention and usefulness of the e-learning course. While these questionnaires provided some valuable data, there were limitations compared with the in-depth responses gained from interviews. The questionnaires are available, upon request to the researcher.

Face-to-face questions were asked at an Army trainee feedback session, which was held by the RTC evaluations officer (no instructors or superiors in attendance) after the completion of the summative field-based assessment session for the course. While it was evident that some very vocal trainees with negative views about e-learning dominated the focus group discussion, this experience also provided data about the individual differences within the group.

It was possible to interview the Reserve soldiers for the distance learning Subject 1 CPL trial. As they were part-time soldiers and the e-learning content was to be completed in their own time, outside of the residential training period or operational periods, permission was given from a Head of the RTC (through the POC) to invite the trainees to be involved in this study. While the Reservists would have had a different experience of e-learning delivery to the Regular soldiers, the course content and competencies required were very similar to the Regular soldiers. Permission was also gained to give the Reservists a pre-course questionnaire that was similar to the ones given to the Regular soldiers, with additional questions on their expectations about distance learning.
I attended the Reservists’ course orientation session and invited them to participate in the research. All of the trainees present at the orientation session (n=16), agreed to participate in three rounds of phone interviews; one at the beginning, one in the middle and one at the end of the three month e-learning period. The Reservists indicated that they were keen to provide feedback to me during the distance-learning period. They provided their private phone numbers, email addresses, and they were keen to make times available to talk with me. However, the time commitments for the Reservists became evident during the three-month period as work, family and Reserve commitments made it difficult to contact them. The e-learning course was particularly stressful for some students and I had to play a neutral role in talking with them. The time pressures also emerged as a major factor influencing the progress of the course and resulted in attrition in the course. Attendance at the post-course briefing focus group for the Reservist trial was also possible and asked follow-up questions about the issues arising from the questionnaires and the interviews.

The Reservists reflected on their experiences with distance learning using the e-learning packages and the changes in their expectations and experiences. In response to the trainees’ concerns about the lack of peer communication in the e-learning course, I set up an online discussion forum for the trainees on the university site using Blackboard. The university provided permissions to ‘enrol’ these trainees in a course that provided them with the experience of using online discussion. While only five trainees used this forum, this opportunity proved to be a valuable experience and source of data for the research.

While there were small numbers of Reservist respondents in the pre-course questionnaire group, along with the associated limitations on statistical reliability and possible bias, the data could be compared with the issues being raised in the interviews and by the other respondents and with the emerging concepts. Therefore, it was possible to include the concerns of Regular and Active Reserve soldiers involved in the use of e-learning in the comparative analysis.

### 3.5 Researching in the organisation

The procedures for doing Grounded Theory were conducive to understanding the social context of e-learning from the perspective of the Army respondents. The organisation’s operational and training concerns were the main influences on whom could be spoken to and when they could be interviewed. It was important that this research did not interrupt
operations and that confidentiality and anonymity was assured. As an external researcher, particularly doing qualitative research, it was also important to have a relatively long period available to negotiate access to sites and respondents and to fit in with the operational activities.

It was necessary to gain an understanding, and to work with the organisational culture to gain the confidence and trust of staff. Working within the organisational hierarchy and having a POC who could negotiate with gatekeepers facilitated the research processes. It was important to negotiate entry to the organisation with higher-level staff by establishing some mutual interest and benefits from the research. This higher-level support was particularly important in a hierarchical organisation that required approval through the chain of command for me to access staff and sites. Discussing the research aims with senior staff members encouraged an interest and facilitated support for the research from higher management levels.

It was also necessary to be sensitive to the training schedules and requirements. Where possible, the research took place during the Army’s e-learning training activities or ran in parallel with the Army’s training evaluation processes. The POC provided alerts when new e-learning courses were commencing or when there were new developments, and I took advantage of all offers to access sites or respondents. It was necessary to be very flexible and responsive about the data collection, including responding rapidly to offers for data collection or being patient as arrangements made for accessing sites were postponed, or cancelled, due to operational or approval requirements. There was also a practical delimiter for data collection due to a major change in the management and structure of the Army’s e-learning project in mid 2005. Therefore, while theoretical saturation was the focus for data collection, the organisation’s operational concerns influenced the timing of data collection and the extent of the research period. By persisting with the aim of gaining a diverse range of perspectives from a wide range of stakeholders, it was possible to obtain theoretical saturation of the main themes.

My involvement in the research was generally passive, limited to observing, recording and reflecting on the experiences and activities associated with e-learning. Any time that I was dealing with Army staff or observing a site, notes were taken for the research. However, there were also times when a more active role was played in providing feedback to the
organisation, including regular progress reports, a report written with a Headquarters RTC staff member (also the POC) on the Reservist pilot (Newton, Ashman & Ellis 2005) and a major report, (Newton 2005) to the Army’s Headquarters Training Command. Practical recommendations that were presented to the Army (Newton 2005) are reflected in the data analysis chapters of the thesis.

This study indicates that it is possible for an external researcher to gain access to respondents in a military setting and to use an inductive approach to encourage reflection of experiences. A high level of respondent co-operation was experienced while conducting the data collection. While there was encouragement from the soldiers’ superiors for respondents to participate in the interviews, the respondents indicated that the interviews were a positive experience that provided them with the opportunity to provide feedback on a range of issues. My participation in the research at the Army sites added richness to the research experience, and assisted in understanding the respondents’ experiences and perspectives. While recording events relating to e-learning in the organisation, it was possible to observe the nature of the workplace and the training.

External research in an organisation involves being open to the understanding of a wide range of unfamiliar, and at times, complex factors and situations. This understanding includes managing and using the large amount of organisational jargon and acronyms (which was very evident in the Army), and specific concepts related to the organisational culture (e.g. military ranks and forms of address). This research experience was valuable as it provided additional insights into the organisational culture.

3.6 Conclusions

This chapter discussed the process of selecting a research approach that would satisfy the research aims to provide both empirical and theoretical outcomes for the study. A Grounded Theory research approach was selected as appropriate for achieving the research aims. The usefulness of a Grounded Theory approach in this research situation is discussed in terms of the iterative cycles of data collection and analysis, which enabled the comparison of stakeholders concerns of across the range of the Army’s e-learning activities. The exploratory research approach complemented the organisation’s ongoing course evaluation methods and provided insights, which both satisfied the aims of the thesis and informed the Army’s discussions about e-learning. While Grounded Theory has
been used in workplace studies, very few studies have applied Grounded Theory to researching e-learning issues. The practical and theoretical applications of a Grounded Theory approach in the study are further discussed in Chapters 8 and 9.

Therefore, this study adopted a Grounded Theory approach to meet the aims of the study to provide empirical workplace-based research that informs the development of a model. Chapters 4 to 7 discuss the main factors that emerged from the data analysis as influences on the effectiveness of the Army’s e-learning.
Chapter 4 Organisational priorities

4.1 Introduction

The results of the data analysis are presented in Chapters 4 to 7. Based on the analysis of the concerns of the Army respondents, the four factors influencing e-learning effectiveness emerged as:

- Organisational priorities
- Learning environment
- Instructor’s role
- Learners’ needs

From the data analysis, the core concern that explained the variation in respondents’ concerns and actions relating to these four factors, was managing tensions by integrating e-learning into the organisational culture. The analytical approach used in this research, with examples provided from the organisational priorities factor, is outlined in section 4.2.

Chapters 4 to 7 provide the data analysis and examples of respondents’ perspectives in relation to these four main factors and the core concern (Figure 4.1). The main factors are presented in section 4.3 (Organisational priorities), Chapter 5 (Learning environment), Chapter 6 (Instructor’s role) and Chapter 7 (Learners’ needs).

Figure 4.1 The main factors and core concern that emerged from the study and the focus of Chapter 4 (shaded)
All of the main factors and the core concern are interrelated. The constant comparative method used in this study allowed the overlaps and interactions within and between the main factors and the core concern to inform the development of the substantive model, which is presented in Chapter 8.

Therefore, this chapter:

- provides an overview of the theoretical analysis processes used in the research, with examples for the organisational priorities factor (4.2)
- discusses the main concepts that informed the generation of the organisational priorities factor (4.3)
- presents a summary of main concepts in the organisational priorities factor and provides recommendations for practice (4.4)
- presents a conclusion to the chapter (4.5).

### 4.2 Theoretical analysis

This section outlines the theoretical analysis process adopted based on the constant comparative method as described in section 3.3.3. In summary, this method yields a range of theoretical codes, or main categories of factors, that informed the generation of a core concern (or core category). The core concern of the respondents informs further data collection and data analysis to assist in theory development, which informs the development of a model. The analytical processes described in this section were used to generate all of the main factors that emerged as important for the respondents.

In the study, after data was collected from a few different respondent groups, the coding framework started to develop quickly and some main issues started to emerge. Through the constant process of comparing incidents and codes, a pattern was discovered in the concerns and actions of respondents. To guide the substantive coding of the data three questions suggested by Glaser (1978, p. 57) were continually asked of the data:

- What are these data a study of?
- What category does this incident indicate?
- What is actually happening in the data?
These questions assisted in focusing on the main factors that influence e-learning effectiveness for the respondents in the dynamic and complex Army environment. The results and implications of asking each of these questions are discussed in turn, with examples provided from the organisational priorities factor.

4.2.1 ‘What are these data a study of?’

The first question helped to focus on respondents’ concerns and actions, rather than simply describing or summarising all the aspects of the respondents’ replies. For example, it was evident early in the research that aspects of the workplace culture were a major factor influencing perceptions of e-learning. However, respondents did not talk about ‘workplace culture’. Instead, they talked about the culture in terms of their experiences, such as ‘we were told to do it’, ‘it had to be approved through the chain of command’, ‘there are turf wars’, ‘It’s hard to change the way things are being done’ and ‘The Army works in a different way to everyone else’. These data incidents informed the development of codes, which further informed the development of theoretical concepts. Figure 4.2 outlines the comparative process of generating codes, with examples from the organisational priorities category.

Figure 4.2 An example of the constant comparative process of incidents of data that informed the development of codes in this study

4.2.2 ‘What category or property of a category does this incident indicate?’

After collecting more data, some trends started to emerge that assisted in building the concepts. The incidents in turn became the beginning of properties of the concepts. Figure 4.3 shows an example of this concept development process.
In reality, many incidents informed the development of a concept. Concepts were also continually compared with the incidents of data to inform memos and to further develop the theoretical concepts. The names of these concepts changed, and relationships were determined, as the data was collected and compared. The codes were based on particularly descriptive phrases used by the respondents, such as ‘turf wars’, or on a conceptualisation of the main issue being discussed. The relationships between these concepts formed the basis for the development of theoretical codes, which focused attention on the developing theory.

In this way, the code has to ‘earn its way into the theory’ (Glaser 1978, p. 57). As the main concerns and concepts became clearer, it was easier to make these decisions. A wide range of concepts were developed and compared and as interrelationships were established, broader categories were developed that reflected these relationships. For example, the organisational priorities category included a wide range of concepts and related properties, including ‘hierarchical structure’, ‘infrastructure provision’, ‘policy concept and practice’ and ‘communications’. The term ‘organisational priorities’ was used as the respondents were discussing concerns that related to the inherent authoritarian nature of the organisation and what was expected to be done of them.

A large number (218) of substantive codes were generated that included descriptive aspects (e.g. role of respondent and location), and the developing concepts and their properties. Through the process of comparing incidents in the data to each other, data to
concepts and concepts to concepts, the theoretical aspects of the research started to
develop. By constantly comparing the codes, it was possible to reduce and refine to reflect
the main concerns and their relationships. An example of the comparative process used to
generate substantive codes and categories from the data in this study is illustrated in
Figure 4.4.

![Figure 4.4 An example of the constant comparative process of concepts that informed the
development of the major categories in this study](image)

The generation of the major categories of factors reflected the attitudes, beliefs and
experiences of a wide range of stakeholders in the Army’s e-learning activities. In
particular, this was a very structured organisation with well-defined sections responsible
for e-learning activities, which are management, design and development, delivery and
learning. The interrelationships between these e-learning related sections were evident in
coding and in the memos made during the research. These major factors earned their way
into the developing model as they reflected the respondents’ perspectives on their
experiences of this division of activities associated with e-learning. These
interrelationships were the basis of the sources of tension and concern for the respondents.

### 4.2.3 ‘What is happening in the data?’ The core concern

The third question asked of the data was ‘what was the basic problem(s) faced by
participants in the action scene and what accounts for the basic problem and process?’
(Glaser 1978, p. 57). This question assists in generating the ‘core category’. This category
accounts for the pattern of behaviour ‘which is relevant and problematic for those
involved’ and it is usually a ‘Basic Social Process’ of what explained the most variation in
respondents’ behaviour (Glaser 1978, p. 93). Once generated, the core category delimited
the coding process and indicated gaps for theoretical sampling.
For this study, it took a few stages of refinement to articulate the core category; or the core concern of the respondents. It was evident that influences of the organisational culture were important to respondents and that their concerns and actions reflected this influence. E-learning had been introduced into this culture through the hierarchical structure, and respondents raised various organisational and individual issues based on their expectations and experiences. It was evident that there were differences in perspectives, experiences and concerns between the different sections of the organisation involved with e-learning. Therefore, based on this analysis the main concern raised by respondents was, at first, defined as trying to fit e-learning into what is expected to be done around here, or fitting e-learning into the organisational culture.

Identifying the core concern provided insights into the previous data analysis and effectively brought together the concerns and actions of the respondents and provided a focus for further data collection. Instructors, as the implementers of e-learning courses, experienced the impact of this ‘fitting in’ process along with the other respondents. However, as intermediaries in the e-learning process they were reflecting on the tensions between the expectations of the management and course design, and the experiences of delivery and learning. Therefore, the instructors’ perspective, in particular, highlighted ‘tensions’ in terms of fitting e-learning into the organisational culture. It was evident from the later rounds of the data collection that the e-learning environment was being modified, within the constraints of the organisational culture. Therefore, ‘fitting in’ was changed to ‘integrating’ to better reflect this process of change and adaptation. The core concern for respondents was identified as managing tensions by integrating e-learning into the organisational culture.

This core concern proved useful for understanding the main factors. It related easily to the concepts, it occurred frequently in the data and it had clear implications for theory development. The categories of main factors reflected, and were informed by, the main concern of the respondents. Figure 4.5 outlines the comparative processes that informed the development of theoretical categories in the study.
Theoretical saturation was reached when, despite looking for a range of respondents who may have different perspectives, no new insights were being provided for the theoretical categories, including the core category. This saturation indicated that it was time to stop data collection, and that further theoretical development would require reflection and refinement of the categories and their relationships to develop the model.

### 4.3 Organisational priorities

The main concepts and their properties relating to the organisational priorities factor are summarised in Figure 4.6.

The two main concepts relating to the organisational priorities factor were e-learning policy and infrastructure, and workplace culture. The first concept reflects issues relating to the provision of centralised decision-making and the provision of regional infrastructure across the organisation to support e-learning. The second concept relates to the inherent workplace culture that affects the expectations of the role of e-learning in Army training. These concepts are interrelated and contribute to the decisions and actions relating to e-learning developments.
While policy documents tended to reflect the perspectives and goals of managers and guided the course design and development, the experiences of instructors and trainees more directly reflected e-learning effectiveness. Differences between expectations of e-learning developments in policies and the experiences of implementation created tensions in understanding the role of e-learning in Army training. These tensions were being resolved by staff working within the workplace culture and organisational structures to integrate e-learning into the training culture. All respondent groups reflected on issues resulting from the impact of the assumptions, goals and processes inherent in the organisational culture and structures on e-learning activities.

While management goals were based on policy documents outlining organisational priorities, all of the respondent groups reflected on issues resulting from the impact of the assumptions, goals and processes inherent in the organisational culture and structures on e-learning activities. Sections 4.3.1 and 4.3.2 discuss the main concepts and the related issues and provide some relevant respondent quotations that relate to the organisational priorities factor.

4.3.1 E-learning policy and support infrastructure

Figure 4.7 indicates that by 2003 the Training Command had planned that the e-learning processes, methodologies and techniques were to have been established. From 2003, there would be continued expansion of e-learning projects into new courses, particularly officer courses and the development of technical systems capability. There was a particular focus on the development of all-corps soldier training, which includes the Subject 1 CPL course. By the end of 2005, the TTC had developed over fifty stand-alone CD-ROM learning modules, mostly in the Subject 1 CPL and Subject 1 Sergeant courses. Figure 4.7 also illustrates the structured planning of course development with the support of established infrastructure, including centralised design through the TTC and regional delivery through the RTCs, co-ordinated through Headquarters RTC. The external influence of Department of Defence is also indicated by the provision of a Learning Management System (LMS) through the Defence Restricted Network (DRN).
In mid 2003, planned targets for flexible delivery not been made past 2005 (Figure 4.7). The collection period (2004 to mid 2005) was a consolidation period of e-learning in the Army. Changes in personnel and policies in the Training Command from mid 2005 resulted in changes in the e-learning program during 2006. A major new project was launched in early 2006, called the ‘Hardened and Networked Army’, which will include the examination of the use of mobile e-learning technologies (Department of Defence Australia 2006b). While this announcement occurred after the data collection and analysis period for this study, it indicates the influence of the constantly changing operational environment and technologies on the Army’s e-learning developments. The impacts of the new focus for Army training on e-learning projects and effectiveness will require further research.

Figure 4.7 Outline of Training Command-Army’s flexible delivery capability, provided at TTC briefing meeting for this study, 14 August 2003.
The main issues that arose from the data analysis relating to the two main concepts that informed the organisational priorities factor are discussed in sections 4.3.1.1 and 4.3.1.2. All of the following discussion is very firmly grounded in the perspectives of the respondents.

4.3.1.1 Policy: compliance and compromise

To encourage the acceptance and sustainability of e-learning projects, policies need to be aligned with the training culture. The hierarchical and structured approach to planning and managing activities in the organisation dominated the conduct and experiences of e-learning. Policies relating to e-learning were issued as formal instructions from the Department of Defence, Headquarters Training Command-Army, the TTC and Headquarters RTC. While managers only referred to these policies in passing, there was evidence of the impact of these decisions on expectations and experiences of e-learning. One exception was the design instructions developed by the TTC (Training Technology Centre-Army 2003) for the design of the e-learning courses. The TTC manager (interview) referred to this document as ‘The Rock’, and instructional designers and course developers discussed it as a core document.

As summarised in section 2.6.2, the implementation of e-learning in the Army since 1996 had been in response to external directives from the Department of Defence. An external directive (Department of Defence Australia 1996a) for an efficiency review provided top-down support to change training delivery, which the Army used to gain support for the implementation of e-learning. Where proposed changes were previously met with resistance from management, the high-level support for efficiency outcomes provided ‘commitment to projects’ that fulfilled the aims of the efficiency review (Past senior training manager interview). Centralised e-learning policies also provided commitment to projects, despite the continual changes in management staff in the Army.

Therefore, the top-down support and consequent policy development provided managers with the framework to develop co-ordinated and centralised e-learning projects. The courses that were targeted for e-learning development included subjects that involved high trainee movement costs and high training costs, such as those courses requiring regular refresher training for all personnel (e.g. navigation and first aid), and core courses for promotion.
Shifting the focus of training from ‘training delivery to learning facilitation’ was also a focus for the implementation of e-learning (Retired senior manager interview). Policy documents reflected this shift in aims, with statements changing from a focus on the ‘delivery mediums’ to ‘the facilitation of the “learning” component’ (Headquarters Training Command-Army, 2003, p. 4). This shift was also discussed in terms of organisational change as ‘a challenge’ requiring ‘a fundamental shift in the way training was viewed and carried out’ (interview). While there was a shift to some independent learning opportunities, e-learning delivery reflected the traditional training culture, with the delivery of the CD-ROM courses in instructor led classrooms.

The external efficiency objectives provided a scaffolding process for managers to develop other training goals that focused on standardising training for all trainees and reducing disruption to unit operations and soldier’s families. The goals for using e-learning to improve efficiencies were also reflected in statements in internal policy documents (Headquarters Training Command-Army 2002b, 2003, 2004). Embedding e-learning goals within broader organisational goals allowed managers to address changing training requirements. With increasing operational demands in recent years and decreasing Army recruitments, it has also become more essential to provide Reservists with the same opportunities as Regular soldiers to achieve core competencies for field operations: ‘You can’t just look at a group of Corporals and say, “You're Reservist, you stand over there”. You have to be able to say, “You are a Corporal, do that”’ (Retired training manager interview). The reduced time available for Reservists to attend training also provided the incentive to trial distance e-learning. E-learning policies that aimed to provide consistent, standardised content to all trainees, regardless of where they were based, or whether they were employed part-time or full-time, where supported by the respondents. There were other issues that related to trainee support needs that influenced the achievement of these goals discussed in Chapter 7.

There was awareness that there could be significant differences in the quality of training within and across training centres, depending on instructors’ knowledge and training expertise. There are also legal and occupational health and safety issues for all trainees to gain consistent and standard training competencies. ‘It can’t be such that you turn out a soldier who is less capable because you put them at risk, and you put the people around him or her at risk, you put the mission at risk’ (Past training manager interview). E-
learning was valued as it could provide consistency in content and training approaches across the training centres.

Conflicts between the intended distance delivery of e-learning courses and the practice of using them in residential classrooms emerged. The expectation was evident in the Army’s evaluation reports of e-learning trials in the 1990s that e-learning would be eventually moved to distance learning. The trials were instructor-led classroom sessions rather than distance learning to provide instructor feedback and supervision of the trainees. There were also statements of concerns in these reports that most trainees are not independent learners and that distance learners would require support (Headquarters Training Command-Army 2000).

‘Distance Education and Training’ (DET) was used in Army policies to define ‘training delivered by training establishments at a distance from trainees that may include residential components of the course’ (Headquarters Training Command-Army, 2003, p. 3). Implementing distance learning, using e-learning approaches, faced many inherent cultural and technical barriers. These barriers included:

- managers’ reluctance to allow disruptions to operations in units for regular soldiers; the authoritarian teacher-trainee relationship that created difficulties in defining distance learners’ support needs
- the need for security of Army doctrine and security of course assessment;
- the need for field-based assessment
- equity in access to computers in training establishments (Headquarters Training Command-Army 2003, Annex).

While the Army’s policies supported the use of flexible learning approaches, the flexibility for trainees to access the training they required, how, when and where they needed it was limited by the decisions to deliver e-learning courses in structured classroom settings. The programming and presentation of e-learning course design did not support a flexible approach for trainees to access aspects of the content for individualised learning. Therefore, the rhetoric associated with more flexible, and independent e-learning opportunities conflicted with the established training culture. There were contentions between the aim to provide flexible learning opportunities through e-learning course
delivery and the experiences of e-learning for instructors and trainees. These tensions contributed to varying levels of support and some resistance for e-learning use in Army training. E-learning policies need to be aligned with technical infrastructure and workplace cultural factors to provide relevant outcomes.

4.3.1.2 Infrastructure: standardisation and diversity

Aligning e-learning functions within the hierarchical organisational structures encouraged the development of sustainable infrastructure, including technology provision, training centres and support services. The shift to centralised e-learning design and development and regional delivery reflected the organisation’s need for more efficient training. The establishment of a centralised e-learning infrastructure supported the management, design, development and distribution processes. To improve and maintain control of the quality of the e-learning products, training managers, and specialised instructional design and courseware developers were centrally located in the TTC. The courseware was distributed to the RTCs for delivery to residential groups of trainees. However, the TTC and the RTC systems are within different hierarchies of the Army, which resulted in some conflicts, in balancing priorities (Senior training manager interview).

E-learning policy supported the development of the RTC system, which aimed to encourage efficiency in terms of improving access to training across Australia. An estimated seventy percent of the costs of training were attributable to residential costs and time off for trainees from regular duties (Training Technology Centre-Army, 2003, p.2). The provision of larger e-learning classrooms in the RTCs allowed for larger cohorts of trainees than was possible previously with face-to-face classroom training. Due to the increasing enrolment of Reservists in the Subject 1 CPL course there was also increasing demand on training resources.

There were also questions raised in the RTCs about efficiency being the main motivation for e-learning implementation, rather than focusing on learning needs. There were additional concerns about whether the use of residential e-learning was saving costs, since trainees and trainers were still being transported to centres around Australia to make up course quotas and were being accommodated during residential periods. Establishing an understanding of the efficiency advantages of e-learning implementation for different sections within the organisation would encourage improved acceptance.
While there were advantages in the standardisation of training using e-learning content and delivery, there were also assumptions made about the homogeneity in the provision of technical infrastructure in training establishments. There were structural and regional differences experienced in the supply of infrastructure in training establishments that produced technical inconsistencies and some problems in using the e-learning courses. There was a need to consider the impact of the non-standardisation of technology provision on the efficiency of e-learning course delivery.

The Information Technology (IT) support staff in the RTCs indicated that while there was a need to comply with Army operating equipment standards, there were some site-specific problems resulting from technological differences. For example, some RTCs had smaller computer classrooms than others but were required to take increasing numbers of trainees, forcing trainees to share computers for e-learning. The Local Area Networks (LAN) in the RTCs that were used to distribute the CD-ROM content also varied in technical capabilities, which added to the technical problems encountered by instructors and trainees. There were differences in the types of peripherals, such as CD-ROM drives and video cards being used, that influenced the usability of the e-learning courses. Differences in computer configurations were also raised as possible issues for distance students accessing e-learning courses from their Army base or home.

Experiences of regional technical problems indicated the need for more standardisation in the e-learning infrastructure or for more flexibility in the technical specifications of e-learning course design. The pre 2000 trials had involved testing the e-learning courses at the prototype RTC and trials after 2000 did not include all of the RTCs. It was suggested by the IT staff that e-learning course trials needed to occur at more than one RTC to make understand the impact of different RTC setups and technical requirements on course delivery. Sharing and networking the ideas and problems experienced by IT staff across the training centres would assist in resolving regional technical issues.

Due to the mobility of the managers, instructors and trainees there were opportunities to compare the facilities at training establishments. There was awareness of these regional differences leading to comparisons being made and some expressions of resentment within training establishments. Furthermore, awareness of regional differences in the supply of infrastructure reinforced the culture of ‘territoriality’ (Training manager interview).
between sections in the organisation. This aspect of the culture spread across geographic and functional aspects of the organisation. Therefore, conflicts and inequalities in the provision of technology reflected and reinforced the workplace culture.

External directives continued to influence e-learning infrastructure development and experiences of e-learning. The directive from the Defence Minister, Canberra in July 2003, for the Australian Defence Organisation (ADO), including the Navy, Army, Air Force and eleven defence civilian groups was for the implementation of the Defence Online Management and Instructional Network (Project DOMAIN), which was implemented in 2004. Subsequently, there was a series of externally produced Web-based compliance (e.g. equity, ethics, anti-discrimination) and computer skills training courses delivered over the DRN for Defence employees.

This focus of the project was on delivering networked Web-based courses, developed by the ADO with the rulings governing content development for the new LMS coming from the Defence Information Systems Directorate. The aim was to improve efficiency in developing and sharing e-learning courses across the Department for civilian and military staff. Due to security concerns, it was necessary to use the DRN to provide networked access throughout the Army. However, the limited available bandwidth on the DRN reduced the possibility of providing media-rich content through Web-based delivery. This external technical restriction was presented a major limitation to changing the delivery mode of e-learning courses to a more flexible networked model.

However, the Army was not consulted or involved in the decision-making for this Defence project. This situation created tensions between the external requirements and the Army’s experiences and expectations of e-learning courses. The Army developed some Web-compatible modules, which were trialled temporarily on the DRN during the research period, but they were not adopted due to problems with course design quality and technical issues. The challenges for e-learning course production are discussed in section 5.2.

Subsequently there was misalignment between external directives to implement more networked learning and the provision of supporting infrastructure. This conflict was identified as a major barrier to developing efficient and effective e-learning development.
Therefore, external directives to use the DRN, security concerns requiring the use of the DRN and regional differences in the supply and support of technology, all created tensions in the e-learning environment. Furthermore, there were communication problems between the software purchased by the Department of Defence to produce Web-based e-learning courses for the DRN, the Learner Management System and the Defence personnel administration system that limited centralised management of trainees’ achievements and learning needs. Therefore, one major technical aspect relating to the provision of an efficient secure wide area network that could deliver media-rich course content remained unresolved and continued to be a source of tension for e-learning course development.

The perceptions of e-learning effectiveness were influenced by the availability of centralised infrastructure, diversity of regional access to technology and workplace cultural factors. Tensions arose when there were conflicts between policy and directive expectations and the experiences in the e-learning environment.

### 4.3.2 Workplace culture

Organisational priorities, as expressed through the workplace culture, influenced respondents’ expectations and experiences of e-learning. The hierarchical and authoritarian culture encouraged both areas of support and areas of resistance to e-learning. Leadership and communication structures influenced who participated in decisions relating to e-learning and whether feedback of experiences was incorporated into e-learning planning, or not. Developing effective two-way communication channels between design and delivery sections proved to be difficult due to the territorial organisational structures. Experiences of barriers to bottom-up communication of feedback increased levels of resistance to e-learning in training establishments.

A shift during the research period to more regional decision-making about e-learning delivery options encouraged the instigation of local changes in e-learning use (section 5.2.2.3). Therefore, more control of decision-making to integrate e-learning courses into the expectations of training relieved tensions, particularly for instructors. However, there were concerns about the effectiveness of the modified use of the e-learning courses from TTC course designers. Issues relating to aligning the structured e-learning course design
with the perceptions and experiences of learners’ needs highlighted the nature of the workplace culture.

4.3.2.1 Leadership: e-learning champions

The hierarchical management structure provided a leadership role for managers to exhibit support and commitment to e-learning. There was acknowledgement of the importance of the support of individual senior managers to achieve e-learning goals. Retired managers acknowledged that for the e-learning projects that worked well, there was the support of individual champions: ‘it worked well because you had an individual in the training establishment who had an idea, was committed to it and followed it through with enormous energy and personal commitment’ (Retired manager interview). The current managers supporting e-learning development similarly exhibit this enthusiasm as pioneers and champions for e-learning innovation, particularly within the Australian military context.

Varying levels of support for e-learning within the training sector hierarchy and across training establishments also reflected the politics of decision-making about e-learning developments. In particular, the scheduled movement of all staff members, including managers, within the organisation every two to three years created an environment of constant change that influenced levels of understanding and commitment to e-learning. Managers were under pressure to determine goals and to achieve outcomes within their posting to encourage their promotion or transfer to a more desirable section.

The ‘competitive culture’ and the need for ‘scoring points’ in work performance sometimes resulted in unrealistic deadlines for e-learning project developments and high levels of work pressure. Furthermore, focusing on the agendas within their operations area created tensions between sections and resulted in ‘turf wars’ (Senior training manager interview) and difficulties in communication and management relating to e-learning. Therefore, the dichotomy between the centralised approach to e-learning infrastructure and course provision, and the competitive nature of the hierarchical and functional sections, was a feature of the workplace culture. The resulting division of e-learning activities and diversity in priorities generated competing interests and conflicts that influenced e-learning projects.
Leaders within the TTC were valued as e-learning experts and the staff members were encouraged to become experts in e-learning skills. As most TTC staff members were active soldiers who had expressed an interest in being involved in e-learning course design and development, they were able to incorporate their military experience into course development. The instructional designers and courseware developers valued the opportunities provided by management to gain skills in specialised areas, including undertaking tertiary qualifications and in-service training courses. Civilian contractors were also employed to fill particular skills gaps and were encouraged to mentor staff in order to build-up the skills base. The mentoring of staff had become an established practice that facilitated courseware development, particularly with the new skills required to move to Web-based course development and with the frequent transfer of staff within the Army.

Instructional designers enjoyed the creative environment encouraged at the TTC, particularly the opportunities to develop interactive multimedia activities. Similarly, many of the staff also enjoyed being a part of video shoots as role models on the CD-ROMs. There was a sense of pride in the work and satisfaction in being involved in the production of a complete product ‘from go to whoa’ (Instructional designer interview). Therefore, the instructional designers and courseware developers had developed a strong team culture to support the skill development requirements.

However, understanding what knowledge and experience was valued in relation to e-learning course design and development was contentious. Instructors with particular subject knowledge were selected as Subject Matter Experts (SMEs) to develop the content of the e-learning modules. SMEs were required to work with the TTC staff to check and sign-off all aspects of content, where it complied with Army doctrine and practice. This quality-control check took place at all major milestones in the courseware development, and in e-learning modules included the text and multimedia aspects.

TTC staff found that instructors who had become more familiar with e-learning features and delivery were also more likely to be ‘champions’ in their support for e-learning. These instructors developed an understanding of the possibilities of e-learning course design and tended to suggest ideas for presenting content in the e-learning courses. With frequent staff movements, it was necessary for instructional designers to ‘break in new SMEs’ (Instructional designer interview). Instructors also expressed concerns that SMEs were not
always involved in the quality-control processes and insufficient release time was provided for them to undertake SME duties. Therefore, developing good communication channels between course production and content experts was, at times, difficult, but it was an essential part of developing relevant course content.

There was also evidence of some antagonism between instructors and course production staff. Within the TTC, staff members’ e-learning skills and training (mostly university qualified) were considered superior to the instructors’ skills, which formed a basis for devaluing some SME suggestions about e-learning courses: ‘The course is designed for people without experience in the RTC’ (Instructional designer interviews). Instructors were required to have subject knowledge, active workplace experience and to have undertaken the Certificate 4 in Workplace Assessment and Training. Instructors were not provided with any professional development for e-learning skills, except a basic self-directed orientation to the e-learning course content prior to delivery.

There was some evidence of resentment emerging in the TTC when instructors started to resist the use of e-learning: ‘We are meeting trainees’ expectations. It is designed for the trainees, not the instructors’; ‘The instructors are providing evil feedback’ (Instructional designers interviews). However, instructors valued their Army experience and training skills and the expertise they brought to the trainees. E-learning presented a threat and shift in instructors’ roles, which is discussed in Chapter 6.

Therefore, there was misalignment of the perceptions of the skills base relating to e-learning course production and delivery caused some conflicts. There was a need to understand how different expertise was being valued and developed in the organisation and how to best align skills and experience to support e-learning production and delivery.

4.3.2.2 Communication channels: hierarchy and feedback

Issues relating to the workplace culture also included the hierarchical structure of the communication channels that were available to stakeholders to provide feedback and on e-learning experiences. Due to difficulties in communication between SMEs and course development staff, there had been some problems and delays in e-learning course production. The TTC staff wanted SMEs to understand the capabilities of the features of e-learning so that design and content changes could be better planned.
Conflicts and course production delays also arose when instructors designated as SMEs were provided with insufficient time to attend the TTC to complete this duty. There was acknowledgement within the TTC of the increase in workloads for instructors’ in SME roles: ‘It is a problem. The SME role is secondary to their instructor role. They don't have the time. It is dumped on top of them’ (Instructional designer interview). Insufficient consultation resulted in problems, with misunderstandings between the expectations of instructional designers and the SMEs about design features, or content accuracy that delayed production releases. This conflict in workplace communications highlighted issues relating to communication channels between the course development and delivery sections.

There were formal end-of-course evaluation feedback procedures for trainees and instructors to comment on course content or support problems, including technical or administrative issues. However, any major changes to course content required hierarchical approval processes through the chain of command to Headquarters Training Command, in order to maintain doctrinal accuracy and consistency. These processes were often time consuming with some reports of content changes to e-learning courses taking over a year. While maintaining content currency was a priority for the TTC, doctrine changes were very frequent and updating the CD-ROMs courses was time consuming and expensive, particularly for multimedia components. As a result, out-of-date doctrine content was one of the main reasons that e-learning modules were being criticised and resisted in training centres.

The difficulties in responding quickly to doctrine content changes and other feedback from trainees and instructors resulted in decreasing use of some e-learning modules in training centres. These errors reduced instructors’ confidence in the e-learning courses and provided evidence for them to resist e-learning. These negative attitudes and experiences were communicated in turn to trainees providing them with a basis to criticise e-learning courses. Therefore, there were trade-offs between providing an e-learning course design that aimed to provide structured, stimulating and relevant learning experiences and the technical difficulties in responding to content changes and the experiences of e-learning course use.
The hierarchical leadership and communication processes associated with the organisational structure influenced who participated in decisions about e-learning. The top-down communication channels reduced the feedback from the experience of e-learning in the training centres to the production sections, which increased resistance to e-learning use. Providing effective two-way communication channels between the expectations of e-learning course designers and the concerns of e-learning users was important to reduce resistance in the training centres and to encourage better learning design.

4.3.2.3 Managing change: structure and flexibility

The workplace culture also influenced the ability of the e-learning design and delivery processes to respond to change. Reflecting the structured nature of this large organisation, a formal project management method had been developed based on the experience over the previous five years. However, the division of e-learning related activities accentuated the competing interests and priorities in gaining and acting on feedback and encouraged resistance to e-learning use by instructors and trainees.

The TTC staff valued the structured project management approach as an efficient way to meet increasing and changing demands for e-learning course production: ‘The production planning is more embedded into workplace practice. It provides an “idiot’s guide” to step-step course development’ (Course developer interview). While there was a structured approach to project management and course design, there was also considerable creative flexibility provided to course designers to develop the ‘look and feel’ of the modules to meet learners’ needs. As part of the project management there were also stages of quality testing while the products were development and at various stages of release. This testing involved both in-house TTC testing and pilot runs in the RTCs. Instructors were invited to provide feedback on these trials, however, they were sceptical that this feedback was always included due to the short deadlines for many of the course developments.

Therefore, there were structured and standardised processes for managing e-learning design and development that facilitated e-learning course production and supported the workplace culture. The instructors’ autonomy to change course delivery was controlled by the hierarchical management processes and the structured course design approach reduced the flexibility available for instructors to respond to learners’ needs. There were
difficulties with adapting course content to suit the learning needs of different student cohorts or quickly responding to changing content. Therefore, there was a trade-off between providing structured e-learning course production processes and providing flexibility to respond to learners’ needs and instructors’ requirements in the training centres.

In late 2004, collective representation by RTC managers to senior management to shift the control over e-learning delivery encouraged some regional flexibility in course delivery policy. With a change in personnel in the Training Command upper management, RTCs managers were directed that as long as Training Management Package (TMP) objectives were met, each SI in consultation with the instructors could decide how to deliver training content to suit their needs. There was a shift in control through the hierarchy from course design to delivery sections to decide which aspects of the e-learning courses would be used in training, or not used. With this change in control over delivery modes, the role of e-learning was also more supported and integrated into the training expectations of instructors and trainees.

4.4 Summary and recommendations

The main issues for respondents relating to the organisational priorities factor are summarised, and recommendations for developing a sustainable e-learning environment are presented. These recommendations could provide propositions for further research into e-learning effectiveness issues.

4.4.1 E-learning policy and infrastructure

The Australian Army is a large, dispersed public sector organisation that is influenced by external factors, including the push to implement e-learning courses to achieve learning efficiencies and effectiveness. External policy requirements to encourage efficient training encouraged the Army to scaffold the implementation of e-learning to this external directive. The alignment of e-learning goals with organisational efficiency priorities assisted senior training managers to gain the top down support to invest in substantial technological infrastructure to support centralised e-learning production. Piloting e-learning courses and conducting formal assessments of learning outcomes justified the continued expenditure on e-learning course development. Policies also provided
consistency in the organisation in terms of the goals and directions for using e-learning courses and commitment to projects, despite continual changes in staffing.

**Recommendation:**

Aligning e-learning policies with organisational priorities assists in facilitating centralised support and investment in infrastructure to develop a sustainable learning environment.

Organisational priorities as expressed through the workplace culture influenced the expectations and experiences of e-learning. The intention of e-learning design protocols, which was to include features that encouraged more learner control over the learning process, was modified by the realities of the workplace culture.

**Recommendation:**

Aligning e-learning use with transformational aims in the training culture requires an understanding of the workplace culture and the need and ability to change the focus of training.

Centralised support for e-learning infrastructure encouraged the development of formal management and organisational structures to support e-learning projects. However, the centralised approach resulted in less flexibility to respond to regional diversity in technology provision and learner needs in the training centres. Regional diversity created practical problems in the use of e-learning courses and reinforced the workplace culture of territoriality and competition between sections of the Army.

**Recommendation:**

Understanding the capabilities and diversity in the provision of the organisation’s computing infrastructure will assist in planning and developing effective e-learning.

### 4.4.2 Workplace culture

The hierarchical management structure provided a leadership role for managers to exhibit support and commitment to e-learning. The hierarchical and authoritarian culture encouraged areas of support and resistance to e-learning. Continual changes in management staffing challenged top-level support for e-learning. Developing champions in different e-learning areas, including instructional designers and instructors encouraged continuing support. However, gaining good cooperation between the various e-learning
activities was difficult due to a perceived top-down hierarchy from managers, instructional designers to instructors.

Recommendation:

Understanding how different expertise is being valued and developed in the organisation and aligning skills and experience to support e-learning production and delivery, improves the development of a sustainable e-learning environment.

Issues relating to the workplace culture also included the hierarchical structure of the communication channels that were available to stakeholders to provide feedback on e-learning experiences.

Recommendation:

Providing effective two-way communication and feedback channels within the workplace culture encourages alignment of expertise and skills across e-learning production and delivery processes.

The authoritarian workplace culture also influenced the ability of the e-learning production and delivery processes to respond to change. The centralised management structure provided structured project management processes that supported e-learning development processes. However, this structured approach reduced responses to changes either in the training environment, content changes or problems experienced in the training centres.

Recommendation:

Understanding workplace culture influences on the responsiveness of course production processes to changes or diversity in the use of e-learning courses will inform a sustainable e-learning environment.

4.5 Conclusions

The concerns raised by respondents relating to organisational priorities were presented in this chapter. These issues were discussed in relation to two main influences on e-learning effectiveness - the e-learning policy and support infrastructure, and the workplace culture. A summary of the main issues and recommendations for developing effective organisational outcomes were presented. The concerns discussed in this chapter informed
the development of recommendations for practice. This analysis also contributed to the development of the model presented in Chapter 8.
Chapter 5 Learning environment

5.1 Introduction

This chapter discusses the main concepts that informed the generation of the learning environment factor. Figure 5.1 outlines the focus of this chapter and the relationship between the factors influencing e-learning effectiveness.

Several concepts emerged from the respondents’ concerns about the interactions between e-learning design and delivery processes, which were influencing expectations and experiences in the learning environment. The following analysis is firmly grounded in the respondents’ perspectives. Recommendations for practice are presented at the end of the chapter.

Therefore, this chapter:

- discusses the main concepts that informed the generation of the learning environment factor (5.2)
- presents a summary of the main concepts in the learning environment factor and provides recommendations for practice (5.3)
- presents a conclusion to this chapter (5.4).
5.2 Learning environment: main concepts

The main concepts and their properties relating to the learning environment factor are summarised in Figure 5.2.

![Figure 5.2 Summary of the main concepts that generated the learning environment factor](image)

The focus of this chapter is on the issues relating to the respondents’ efforts to design an learning environment using e-learning courses. Alignment between expectations of e-learning design and experiences in delivery led to overall support for e-learning. However, differences between the expectations and assumptions in design and the experiences of delivery created tensions in the learning environment, and some resistance to e-learning use. While the TTC instructional designers were responsible for decisions about the presentation of content and learning activities, all respondent groups reflected on aspects of the e-learning features and the usefulness of the e-learning courses for achieving learning outcomes.

The instructional design of the e-learning courses aimed to provide self-contained learning opportunities, with only limited instructor facilitation. However, this delivery intention conflicted with expectations and experiences of learning environments in the training centres. Instructors provided field training and conducted summative assessment sessions after the e-learning course residential period. This scheduling provided instructors with the opportunity to reflect on the usefulness of the e-learning courses for knowledge and skill development and the impact of the changes in the learning environment. Thus, the instructors’ views informed the issues relating to the learning environment delivery. The concepts relating to instructional design are presented in section 5.2.1. The issues relating to the experiences of the delivery of e-learning courses are discussed in section 5.2.2.
5.2.1 Learning environment design

The learning environment was influenced by the need to coordinate and align e-learning design and delivery with the organisational structures and workplace culture. There was alignment between the hierarchical organisational structures, the organisational requirements for competency-based course content and structured lesson presentation, and the e-learning course design. Instructional designers supported these organisational requirements, while they aimed to provide innovative learning activities using multimedia technologies. However, external directives to implement Web-based learning delivery conflicted with the limited bandwidth availability of the DRN and the Army’s expectations for rich multimedia e-learning design. The separation of the external management of the technological infrastructure by the Department of Defence and the Army’s e-learning course production, created further tensions in the understanding of how to satisfy expectations of learners’ requirements within the technical limitations.

5.2.1.1 Role of e-learning: implicit and explicit enculturation

The original intention outlined in policy documents was that the design of these e-learning courses was to enable independent, distance learning, with or without facilitation by an instructor (Training Technology Centre-Army 2003). The instructional design of these e-learning courses provided self-contained independent learning modules, which included structured content, interactive learning activities and formative assessments. However, management concerns about the move to more independent learning and experiences with technical limitations resulted in e-learning courses being delivered predominantly in structured residential classroom periods with limited facilitation by an instructor. Trials of distance learning indicated problems with trainee completion rates, trainee support needs and the need for practical reinforcement of skills (Chapter 7).

Aligning the design of e-learning courses with the authoritarian training culture facilitated acceptance of the use of e-learning courses in training programs. All personnel involved in Army courseware production were instructed to use the TTC developed ‘rigorous instructional design methodology’ (Headquarters Training Command-Army 2002b, p. 5). The structured instructional design approach aligned with the Army’s use of an instructivist, behavioural and competency-based approach to training incorporated in the
Army Training System (ATS), ‘the cornerstone for all military instruction’ (Training Technology Centre-Army 2003, p. 12).

Underpinning the TTC development of e-learning instructional design was extensive research into instructional design, adult learning theories and online usability (Training Technology Centre-Army 2003). The approach to instructional design was described as ‘eclectic’ with the TTC selecting ‘design tenants that it considers appropriate for the development of its TBT’ (Technology Training Centre-Army 2003, p. 4). However, the requirement to use the ATS approach for all training influenced the interpretation and application of the TTC research into e-learning theory and practice. This preconception was evident in the behavioural learning theorists mentioned in policy documents and in TTC staff member interviews. It was also observed during the research period that behaviourist theoretical ideas were taught to trainee instructional designers as the preferred way to design e-learning courses. Therefore, the behaviourist pedagogical approaches adopted in e-learning design were supported, since they reflected the training culture and policy requirements.

The e-learning course development approach reflected the accepted project management approach used in the organisation. A structured instructional design approach was considered essential for developing e-learning courses: ‘Instructional design is the strongest part of the medium’ (Training manager interview). The TTC staff members follow a structured Analysis, Design, Development, Implementation and Evaluation (ADDIE) process of instructional design. The TTC’s e-learning instructional design and development is based on Gagne’s (1985) model of ‘conditions of learning’ that provides a sequence of nine ‘instructional events’ and incorporated Keller’s (1987) ARCS model of motivation (Training Technology Centre-Army 2003). TTC instructional designers argued that these instructivist approaches provided an effective project management process for e-learning course design and development and provided trainees with the structure and consistency that was used in other Army training.

The instructional design factors supported the development of a competency-based, linear learning approach to guide trainees through the content and learning activities with minimal instructor support. Instructional designers valued this course design approach as it provided a model of the ATS for the trainees who needed to learn to manage and train
small groups as a Corporal. A structured lesson plan approach was also considered valuable for trainees who had low educational skills ‘to guide them through the content, so that they don’t get lost’ (Instructional designer interview). While there was some recognition of literacy problems in the Army, there was little understanding of the extent of the problem (Training Manager).

Although e-learning design and delivery needed to comply with the ATS, the design guidelines also aimed to include some features of ‘other learning orientations’ (Training Technology Centre-Army 2003, p. 12). For example, ‘[course] scripts have an objectivist orientation, but embedded within the scripts are features found within a constructivist approach—the aim is to empower the trainees to select an approach to assimilate the material that best suits them’ (Training Technology Centre-Army 2003, p. 4). These approaches included the presentation of content through a variety of mixed media presentations including text, audio, video and animation. The multimedia innovations included scenario-based problem solving using video clips of simulated workplace situations and games quality animation with interactive drag and drop problem solving with responsive feedback.

The inclusion of these innovations was described in terms of a shift from the ‘push’ concept of training to the ‘pull’ concept of learning where the trainees ‘can extract information or knowledge for themselves from the multimedia’ (Instructional designer interview). Therefore, there was a transformational aim in the e-learning design, an attempt to move the learning focus to using more constructivist learning activities within a behavioural learning framework.

Achieving a more constructivist approach was interpreted by the instructional designers as providing an ‘active learning’ environment, which was described by the TTC manager as ‘what the user pulls from a self-paced eLearning course as a consequence of their own endeavours, they will learn more deeply and profoundly’ (Greenberry 2004. e.p.). The aim to encourage more learner involvement was as described by another manager as ‘even with an instructivist approach the learners could explore the medium and learning’ (Training manager interview). Therefore, there was a shared expectation by managers and course designers that there were opportunities, within the structured learning design, for learner flexibility and involvement in the learning process.
To establish the role of e-learning in training it was necessary to present doctrinally correct content and modelling of Army values and traditions in the lessons. E-learning’s role was defined with the explicit recognition of the use of training for the enculturation or ‘resocialisation’ of trainees from civilian to the authoritarian Army culture: ‘This is a deconstruction process, a resocialisation process’ (Retired training manager interview). This enculturation process was explicitly embedded in the structured course design and content of the e-learning courseware. Therefore, the e-learning course content and presentation explicitly aimed to reinforce the Army culture through ‘vicarious learning’ (Training manager interview).

Considerable efforts in reviewing and editing went into providing doctrinally correct content and Army procedures in the e-learning course. All of the courses included Army insignia and mottos, and all of the content and scenarios were checked for doctrinal accuracy, including uniforms and Army protocols for actions, speech and interactions. The Subject 1 CPL and Subject 1 Sergeant e-learning lessons were introduced and guided with the use of ‘virtual mentors’ (Training manager interview) who were videoed soldiers or professional actors who were instructed to model Army skills and to lead the learners through the course. Instructional designers considered that the virtual mentor feature was vital for learner engagement in providing a ‘human feel’ and a sense of empathy with the character.

A strong safety culture was also promoted in all of the visual and textual aspects of the e-learning courses. By incorporating safety problem solving tasks, virtual mentors and exemplar scenarios, e-learning was also valued as providing a safe training environment where dangerous situations could be practiced and wrong decisions made during learning. Therefore, the importance of leadership, mentoring and training in the organisation was explicitly incorporated into the design of the e-learning courses. Trainees were aware of any errors in content or presentation of Army doctrine or protocols in the e-learning packages and questioned some of the presentations of the virtual role models. The intention of providing virtual mentors conflicted with the trainers’ expectations and experiences of their role as mentors for the trainees (section 5.2.2.2). Thus, managers and instructional designers supported the structured design of the e-learning courses as it explicitly and implicitly supported the Army’s training methods and the organisation’s cultural requirements.
5.2.1.2 Technological divergence: compliance and compromise

The learning environment was influenced by the capabilities of the wide area network infrastructure provided externally by the Department of Defence, the LAN infrastructures provided in training establishments, the courseware available and the technical features required in the design of the e-learning courses. Improvements in the sophistication of the look and feel of the courseware and learning activities since 2000 reflected the software available, the development of the skill base in the TTC development team and their understanding of the capabilities of producing e-learning activities.

Initially, the courses contained predominantly text and graphics with limited movement, supported by interactive questions and answers. As sophisticated multimedia software became available and the TTC staff developed technical skills, course development included more multimedia features and animation. Instructional designers were trained in various multimedia development products and were directed to select a learning orientation based on their assessment of the appropriateness of the content for e-learning. ‘TBT packages are put together by instructional designers who are driven by the aim to facilitate learning: they are not put together by ‘propeller heads’ whose aim is to demonstrate technology’ (Training Technology Centre-Army 2003, p. 43). However, while the software available to instructional designers was being constantly upgraded there were contentions with the ongoing bandwidth limitations of the DRN and external directives to use more networked delivered courses.

While the Army had focused on CD-ROM development, the potential of electronic networks was mentioned in training policies: ‘the full potential of emerging e-learning practices can only be realised when learning can be delivered on-line utilising an intranet or the Internet’ (Headquarters Training Command-Army 2004, p. E-2). A major issue for the acceptance and effectiveness of the e-learning courses were the ongoing problems associated with maintaining current content in CD-ROM delivered courses. A prime advantage of using networked Web-based courses was the possibility of providing regular updates of e-learning content.

There were tensions resulting from the external directives from the Department of Defence for Project DOMAIN in late 2003 requiring a move to Web-based course development for
distribution across the DRN and use of a new Learning Management System (LMS). This
directive placed pressure on TTC staff to move to developing courses for Web-based
delivery, without consultation about the impact on e-learning design and learners: ‘The
pressure to put things on the Web is a financial decision... It does not provide effective
content for all learners’ (Instructional designer interview).

This top-down directive created considerable pressure on the TTC to reconsider the
multimedia content of the courses and the possible redesign of the courses. In particular,
the technical limitations of the available bandwidth on the DRN threatened the TTC model
of delivering rich multimedia interactive content. Department of Defence directions in late
2004 from Project DOMAIN to use its Web course development tools and Web page
templates imposed further restrictions on the TTC models of e-learning product design
and development.

Project DOMAIN involved a ‘total shift’ in the way that courses could be designed and
presented (Instructional designer interview). The limited available bandwidth on the DRN,
and associated Department of Defence directives on file size limitations, challenged the
continuing development of multimedia features in the e-learning courses. Over the
previous four years the TTC staff had developed high-level skills in using Director™ that
enabled them to produce high quality interactive multimedia: ‘The look and feel was
beautiful - it allowed subtle shadings’ (Instructional designer interview). The courseware
provided the required functionality to make animated scenarios and provided more
learning design options to develop ‘authentic learning and assessment activities beyond
multiple-choice’ (Instructional designer interview).

A prime concern for the instructional designers was the directive to use the Department of
Defence’s purchased course development software (Outstart’s Evolution®), which limited
the design of the courses. The TTC responded to this demand for Web-based courses and
the technical restrictions by developing a ‘hybrid’ approach (Instructional designer
interviews), providing Web-compatible content on CD-ROMs in an attempt to maintain
the quality of the design of CBL products. While the initial Evolution® developed courses
were more text-based than the previous e-learning courses, designers still focused on
providing structured lessons with examples of virtual role models in motivational
introductory and concluding video clips. However, there were still technical problems
with using the DRN for these TTC developed modules. Consequently, Web-based delivery of course content over the DRN was trialled during the study period but not adopted in any substantial way.

Using Internet communication tools to improve e-learning facilitation, particularly for officer trainees, was also proposed by respondents as an advantage of Web-based delivery. Instructional designers were also funded by the TTC to explore the possibilities of Web-based learning using wireless mobile learning technologies in field-based situations (Geddes 2004). ‘Collaborative networked Web-based learning’ was described in Army policies in terms of it being a ‘mature state of e-learning’ (Headquarters Training Command-Army, 2003) and managers indicated that the Army is ‘not up to this stage yet’ (Training manger interview).

Concerns about collaborative e-learning that reflected structural and cultural factors were raised by managers and instructors. These concerns included scheduling instructor availability for facilitating online learning, the need for trained support staff and issues with instructors maintaining credibility online. It was also recognised that the authoritarian teacher-trainee relationship, particularly for non-commissioned soldiers, was a barrier for online communications: ‘the Army does not care what they [trainees] think at least for non-commissioned ranks’ (Training manager interview).

Therefore, the organisational culture and structure was influencing the selection and use of available learning theories and technical tools to develop e-learning opportunities. Designing e-learning courses to support training needs involved a top-down decision-making process that included structured processes of trailing and gaining feedback from users. Online networked interaction was not a priority, primarily due to technical and cultural factors. As the training culture emphasised a behaviourist approach using didactic instruction, the traditional authoritarian teacher-trainee relationships, particularly for non-commissioned soldiers, influenced e-learning design and delivery approaches. Therefore, course production processes complied with the high-level directives and developed compromises that aligned e-learning courses with organisational requirements.
5.2.2 Learning environment delivery

While the design of e-learning courses was well defined in terms of organisational requirements, the delivery of e-learning use in training centres was not well defined and created tensions. The design of the e-learning courses focused on self-contained learning with all of the content, learning activities and formative assessment and learning support:

A key factor in the learning process is the means by which the whole process of learning has been planned by the instructional designers. Instructional design lies at the core of HQ TC-A’s TBT packages; it is the means by which video, graphics, animation and audio are interwoven into an active learning package to optimally maximise learning (Training Technology Centre-Army 2003, p. 3).

Therefore, independent learning support design presented interactive content, learning activities and formative assessment tasks, structured text, visual and audio directions throughout the CD-ROM modules. However, as the e-learning courses were delivered in classroom settings, there was the shared understanding and practice that this decision was intended to replace some traditional face-to-face classroom teaching sessions. This e-learning environment involved more learning independence than traditional face-to-face classes but these were structured learning situations where trainees worked at their pace within the time limits of the residential class session.

5.2.2.1 Role of e-learning: structure and flexibility

As the role of more independent trainee learning in the training program was not clear, and it conflicted with traditional training delivery expectations, there were issues with resistance in the delivery settings. This resistance developed further as content errors started to accumulate in the e-learning packages due to frequent doctrine changes and as difficulties in updating the e-learning CD-ROM content emerged. Therefore, the intentions of e-learning course instructional design were not matched by delivery experiences. Tensions were arising between the requirement to provide structured, formal e-learning course content design and the need for flexibility to meet changing training needs.

While the e-learning courses were designed for independent self-paced learning, instructors presented the courses as self-paced learning to be completed within the scheduled class periods. The self-paced aspect was viewed as an advantage of e-learning:
‘It is self-paced; some trainees are slow and others are fast: this is not a problem’
(Instructor interview). The time taken to do the modules was not seen as an issue with most
trainees completing within TTC suggested times included in the e-learning package.
Instructors and trainees valued some aspects of the self-paced learning possibilities but the
structured nature of the classroom training periods and the very tight training program
schedules prohibited the use of more flexible learning times.

The self-paced aspect was also valued by instructors as providing the option for practice in
class time or revision when trainees could go through a module in ‘browse’ mode without
the formative assessment tasks. However, in general trainees did not have time to practice
or revise the e-learning modules within the set class periods. Providing trainees with
access to e-learning classrooms after class hours to revise or complete e-learning modules
was considered an advantage, particularly in the first week when some trainees were still
learning how to use computers and for trainees with less experience in content areas.
However, instructors were also aware that not many trainees took advantage of the after
hours access due to the long residential training times, which often continued to 9 p.m.

Standardisation of content and learning processes was an advantage of e-learning delivery
compared with face-to-face teaching where the knowledge and quality of instructors’
knowledge, experiences and abilities varied. Following the Army’s training method in e-
learning courses was viewed as both an advantage and disadvantage. Trainees recognised
the Army training lesson approach presented to them in the e-learning courses and
appreciated the provision of some structure to the lesson. However, some trainees
interpreted this approach negatively as simply replicating the content from the paper-based
pamphlets (‘pams’) that provided Army doctrine: ‘A lot of it was transferred from pams,
such as, “In this lesson you will learn...”. It used the same catchphrases as the pams’;
‘Pams on a computer package’ (Reserve trainee interviews). Therefore, the adoption of a
formal instructional design approach corresponded with the organisational training
requirements and the traditional training approach. However, trainees were expecting
more flexibility in accessing content and control over the pace of learning (Chapter 7).

Using the Army training method in the e-learning courses provided the trainees with a
model of the method but it also limited the range of learning opportunities available. For
example, in a face-to-face classroom instructors had the opportunity to provide stories of
their experiences and to adapt the lesson to suit learners’ needs. There was also concern that module completion times could reflect the skill and knowledge base of the majority of trainees in the group rather than individual understanding. While e-learning provided a comprehensive coverage of the doctrine, there were limitations to the extent that instructors could challenge brighter trainees or assist less able trainees. Instructors were concerned that although the structured lesson design and content provided consistency and standardisation, it did not allow delivery to be adapted to respond to changing or different learning needs for various groups of trainees.

The structured technical design of the e-learning modules reduced the possibility for trainees to manage the learning environment. The e-learning modules were designed so that each content section and formative assessment had to be completed before the trainee could progress to the next module. This technical design feature was to encourage trainees to cover all of the content, which instructors supported as providing a structured or ‘logical path’ (Instructional designer interview) for learning. Alternatively, instructors suggested that trainees who had a stronger knowledge and skills base should be able to complete assessments as a type of challenge test and not to have to do all of the modules: ‘there was need for more training needs assessment’ (Instructor interview).

Some trainees found the structured, linear lesson approach inflexible, particularly if they knew the content already. Distance learning trainees were also frustrated that the technical design of some e-learning modules in the Subject 1 CPL course did not allow for interruptions to their study and that they had to repeat sections of the content to be permitted to continue. Therefore, there was a trade-off experienced between standardisation of content and delivery and enabling flexibility in the learning environment to meet learners’ needs.

5.2.2.2 Valid learning experiences

E-learning policy documents indicated that these modules were intended to replace some aspects of face-to-face classroom teaching, particularly lectures, but not practical training (Training Technology Centre-Army 2003). However, e-learning courses were being used as a replacement for face-to-face practical training: ‘Some people miss the point of the multimedia. It is not intended for learning practical skills; it is more about how to manage
them’ (Training manager interview). Thus, there were contentions about the role of e-learning courses in Army training, particularly in relation to learning practical skills.

While the focus of the Subject 1 CPL course was on gaining the leadership skills and knowledge to manage small teams in practical situations, there was the perception from instructors and trainees that the e-learning packages were intended to teach practical skills. In all corps courses, such as Subject 1 CPL, there were trainees without experience in the full range of practical infantry skills that were being presented in the e-learning modules. The e-learning modules were discussed in terms of the relevance for learning providing practical knowledge and skills, with some concern expressed that they were replacing practical, field-based training time. Therefore, there were conflicts between the intention of presenting e-learning visual content and learning activities and understanding of the role of e-learning in the Subject 1 CPL course.

There was overall support for the role of e-learning course content in some subject areas. Instructors reflected on the value of using e-learning modules as replacement for face-to-face classroom delivery and practical lessons. Modules that were considered effective as e-learning delivery included theory content, such as ‘Customs and Traditions’, background to simple practical skills, such as rolling flags and, theoretical background knowledge to practical skills, such as occupational health and safety. Instructors valued the theory-based modules as they provided content that would otherwise be difficult for them to present: ‘The history is good. The instructors would not have that knowledge’; ‘Law of Armed Conflict module has good footage, good visuals. The Tiananmen Square and Vietnam footage adds realism and a historical perspective to learning’ (Instructor interviews). Therefore, multimedia presentation of theoretical content in the e-learning packages was valued as enhancing learning opportunities.

However, there was a range of views about the role of e-learning modules in relation to learning practical skills that led to confusion and tensions in the learning environment. E-learning was seen as ‘a good tool’ that provided a base for practical skills: ‘It gets everyone to a certain level when they go into the field’ (Instructor interviews). There was also concern about the difficulties in gaining practical skills using e-learning: ‘Some subjects on e-learning would be better as practicals - drill and operations, such as wiring would be a lot easier as a practical lesson’ (Instructor interview). It was emphasised that
the trainees still needed to have face-to-face practical experience in most areas. There was also concern that some skills were not practised at all in the field before summative assessment. Alternatively, that there was some doubling up of practical training and e-learning content that would generally be better done as a practical lesson. Therefore, unclear directions on how e-learning modules should be integrated into the training program led to some confusion about the role of e-learning.

Issues with learning practical skills were also related to aspects of the e-learning design, particularly the way skills were visually presented. For example, the lack of clarity and camera angles of some e-learning practical demonstrations (e.g. hand signals) led to incomplete or incorrect learning. While multimedia features were considered as providing useful and interesting content there was a need for the content to be relevant to training needs: ‘So, it has to be a mixture. At the end of the day, they are not there to enjoy themselves. It ain’t the video arcade. As we in the hierarchy say, “This is what we must teach you”’ (Senior instructor interview). Therefore, there was a need to understand the role of e-learning courses in learning the physical and practical skill competencies considered the core focus of the training.

While e-learning courses provided workplace scenarios with virtual role models, including leadership and training methods, providing pre-determined options in the scenarios was considered a limitation for learning: ‘black and white options’ that ‘did not reflect human nature’ (Instructor interviews). The opportunity for students to keep clicking until they found the correct answer in multiple-choice questions in e-learning assessments was seen as not reflecting real decision-making situations. Providing trainees with the opportunity to discuss the range of answers in face-to-face sessions after the e-learning session was suggested as providing an improved learning experience.

There was concern about the relationship between completing the e-learning modules and actual learning outcomes. While trainees had to gain sixty percent in the formative e-learning assessment tasks, some trainees were seen to be rushing through the courses, ‘just clicking through’ and ‘not assimilating the knowledge and skills’ (Instructor interviews). One popular saying with instructors to describe e-learning lessons was ‘a data dump - once passed, it was flushed from system’. Apart from demonstrating a shared view amongst some instructors, this attitude revealed a concern with learning retention. However, there
was some support for e-learning courses based on experiences of transferring learning and learning retention in the field, for example: I was spending less time showing them how to do it and retesting. They can do the practical needing less controlled supervision; ‘They can actually do it - not perfect, but they can do it’ (Senior instructor interviews). Therefore, there was support for e-learning courses in terms of providing an initial orientation and basis for demonstrating physical and practical skills.

Informal comparisons of e-learning and face-to-face learning retention were informing instructors’ understanding of the usefulness of e-learning delivery. While e-learning modules were valued for providing theoretical knowledge and some basic understanding of practical skills, there were varying perceptions about the levels of retention of e-learning content for field-based practice and assessment. Other factors not related directly to e-learning also influenced retention, including individual learning ability, past educational experiences, interests, time of day and Army experiences. For example, the different backgrounds of an all-corps group meant that some trainees had previous knowledge of the skills. Experienced trainees found learning and transferring e-learning content to the field easier than less experienced trainees did. Learning retention was also related to the two-week time lag from the e-learning lessons to field-based practice sessions.

One of the main concerns about e-learning content was the increasingly out-of-date content in the modules. Frequent changes in doctrine were difficult to include in the CD-ROM courses and influenced the usefulness of the courses. There were reports of some content being up to four years old and not containing recent doctrine changes. For example, while the ‘Military Discipline Law’ module contained the knowledge base and skills considered suitable for e-learning delivery, due to problems with constantly changing content and difficulties in updating the CD-ROM content, this module was no longer used by the end of the research period and had been replaced with face-to-face classes.

Instructors pointed out that using multimedia, particularly videos, to present content exacerbated difficulties and costs in updating the e-learning courses. Often professional actors were used in video-shoots, so it was expensive to redo the video, or only small sections of the video became out-of-date, which made it misleading for the trainees.
Instructors were also concerned that explaining errors in the course to trainees was considered ‘unprofessional’ (Instructor interview) and reduced the credibility of the e-learning courses for trainees. There were also potential legal issues if doctrine was incorrect. There was recognition that in many subject areas, such as law, there were frequent content changes that made content maintenance difficult for both paper-based or electronic updating. However, using CD-ROM delivery contributed to the difficulties in editing and updating courses and maintaining version control information. The issue with out-of-date content was also one of the main drivers for the shift in course delivery experienced during the research period, discussed in section 5.2.2.3.

5.2.2.3 Delivery divergence: adjustment and integration

Concerns about e-learning course delivery effectiveness were related to the learning of practical skills, the currency of the content, learning retention and trainee feedback. During 2004, negotiations between instructors and the senior instructors had resulted in some RTCs delivering more practical or face-to-face instruction sessions within the residential training periods. While e-learning was viewed as providing initial background to practical skills, instructors valued the additional engagement in relevant practical sessions to reinforce learning and to gain an understanding of trainees’ learning progress.

The use of more mixed mode teaching approaches in the training centres reflected traditional face-to-face classroom practices with short practical demonstrations and practice sessions incorporated within the residential class time. Instructors were managing available course time to provide some short face-to-face classroom or closed field practical sessions on the same day as the relevant e-learning sessions, particularly for skills that could be quickly demonstrated, such as setting up flares and parade drills.

Combining face-to-face group discussion or practice sessions with e-learning lessons was valued for providing learning clarification and learning reinforcement. Trainees also indicated in the course feedback a preference for practical sessions. This preference confirmed the instructors’ preference for more practical training that was integrated with the e-learning modules: ‘With the pracs closer to the CBL, people learn quickly. They are hands-on learners, most of them’ (Instructor interview). Combining e-learning sessions with short practical sessions was aimed at providing trainees with more experience and
understanding of group dynamics and for instructors to demonstrate leadership and training skills.

E-learning and practical skills learning were perceived as requiring different skills and providing different types of outcomes: ‘We added practical sessions because conceptually trying to understand what a computer was saying and physically doing it is completely different’ (Instructor interview). E-learning was described more positively in the later instructor interviews as a ‘teaching aid’ or ‘teaching tool’ that had a role in providing theoretical content and a background for practical skills: ‘It gets everyone to a certain level when they go into the field’. Practical training was considered essential to provide hands-on experience, particularly where some degree of safety skill or knowledge was involved. Providing some experience of the realities of the working environment was also important, and difficult to gain from the e-learning: ‘and they go out the back and physically do that with the barbed wire, with the razor wire and they learn how sharp it is and it scratches your hands’ (Instructor interview).

There was confidence that the mixed delivery approaches were providing an improved learning environment:

We do lessons on computer-based learning and then we go out and do the practical reinforcement of it: “OK, you’ve seen the little computer graphic set up the barbed wire, now here is a couple of rolls of barbed wire and some star pickets, let’s get into it”. And they actually take from the CBL and they put it to practical use (Instructor interview).

There were also a few reports of better overall summative competency outcomes using mixed delivery methods, compared with similar past groups of learners using predominantly e-learning courses. Therefore, concerns about the role of e-learning in relation to learning practical skills were being eased with the shift to integrating more practical training with e-learning sessions.

There was a need to understand what training methods work best for particular theoretical and practical competencies and for particular groups of soldiers. Instructors suggested the need for formal evaluation and validation of the transfer of e-learning to the field. The formal Trainee Evaluation Questionnaire given to trainees at the end of each training module was criticised by instructors, as it did not ask questions about the effectiveness of
training in terms of applicability to field situations. There was also a need to better understand the value of using different course delivery methods: ‘there needs to be some identification of areas that could be enhanced with face-to-face and understanding what would be better learnt from multimedia’ (Instructor interview).

Therefore, the embedded assumptions in the design and delivery of e-learning courses influenced the development of the learning environment. There were contradictions in the design of e-learning courses for independent learning and the delivery of courses in traditionally structured classroom situations facilitated by an instructor. The inflexibility to respond to changes in content or diversity of training needs built into the design of the e-learning courses encouraged resistance in the learning environment. Subsequently, there were pressures for adjustment of the delivery of e-learning courses to fit into the expectations of effective teaching and learning conditions to provide relevant learning opportunities. With the use of mixed course delivery modes, the role of e-learning was also more supported and aligned with the training expectations of instructors and trainees.

5.3 Summary and recommendations

The main issues for respondents relating to the learning environment factor are summarised, and recommendations for developing effective e-learning are presented. These recommendations could provide propositions for further research into e-learning effectiveness issues.

5.3.1 Learning environment design

The behaviourist e-learning instructional design principles were explicitly aligned with the authoritarian training culture. This alignment process improved top-down support for e-learning and facilitated the enculturation of the approved training method for trainees. However, using multimedia in problem-based learning activities was also intended to provide innovative approaches to encourage some learner control over learning. The enculturation of trainees was also explicitly embedded in the design of the content aimed to provide a model of Army culture and training methods. However, delivery experiences did not always align with design intentions, resulting in tensions in the learning environment.
**Recommendation:**

Understanding the explicit and implicit enculturation processes influencing e-learning course design and delivery will assist in developing effective learning opportunities.

While considerable investment had gone into standardising instructional design and course delivery, diversity in technology provision and access in the learning environment created tensions for users. There were conflicts between the Department of Defence’s external directive to use Web-based learning and particular course development tools and design, and the limited available bandwidth and the TTC’s expectations for multimedia e-learning course design. The management of the expectations of instructional design and delivery with regional and central technological limitations was contentious and reflected ongoing political and regional control issues.

**Recommendation:**

Coordinating e-learning design and delivery with existing technology provision priorities will assist in developing relevant learning opportunities.

### 5.3.2 Learning environment delivery

While the e-learning courses had been developed for independent learning, the courses were being delivered primarily in structured classroom situations, facilitated by an instructor. The workplace culture had influenced the decisions about delivery and the contentions between course design and delivery influencing the intended learning environment. The organisational need for standardisation of content and delivery were being challenged by the need for flexibility to respond to diversity and changes in the learning environment.

**Recommendation:**

Coordinating e-learning design intentions with expectations of delivery practices will encourage the development of effective learning opportunities.

Defining the role of e-learning in Army training was particularly contentious in relation to learning practical and physical skills. Providing valid learning experiences depended on the provision of correct content and useful background knowledge for practical skills. Providing doctrinally correct content in e-learning courses was being challenged by the
realities of constantly changing operational conditions. Instructors resisted e-learning use where these changes influenced the provision of effective learning opportunities. Providing mixed modes of course delivery aligned more closely with the expectations of students and instructors.

**Recommendation:**

Aligning course design and delivery modes with training priorities and learners’ needs and experiences will assist in developing effective learning opportunities.

### 5.4 Conclusions

The concerns raised by respondents relating to the learning environment were presented in this chapter. The issues were discussed in relation to two main influences on e-learning effectiveness - the expectations embedded in the design of the e-learning, and the experiences of e-learning delivery. A summary of the main issues and recommendations for developing effective learning opportunities were presented. The concerns discussed in this chapter informed the development of recommendations for practice. This analysis also contributed to the development of the model presented in Chapter 8.
Chapter 6    Instructor’s role

6.1 Introduction

This chapter discusses the main concepts that informed the generation of the instructor’s role factor. Figure 6.1 outlines the focus of this chapter and the relationship between the factors influencing e-learning effectiveness.

![Figure 6.1 The main factors and the core concern that emerged from the study and focus of Chapter 6 (shaded)](image)

Several concepts emerged from the respondents’ concerns about the impact of using e-learning courses on the instructor’s role in relation to the position in Army training, and the role in supporting learners. The following analysis is firmly grounded in the respondents’ perspectives. Recommendations for practice are presented at the end of the chapter.

Therefore, this chapter:

- discusses the main concepts that informed the generation of the instructor’s role factor (6.2)
- presents a summary of main concepts in the instructor’s role factor and provides recommendations for practice (6.3)
- presents a conclusion to the chapter (6.4).
6.2 Instructor’s role: main concepts

The main concepts and their properties relating to the instructor’s role factor are summarised in Figure 6.2.

![Figure 6.2 Summary of the concepts that generated the instructor’s role factor]

Instructors provided a vital role in delivering the e-learning courses to the trainees. While the training culture was reflected in the instructional design approach used for developing e-learning courses, the directives for the course delivery challenged the traditional instructor role. The focus of this chapter is on the concerns relating to the efforts to reconcile the instructor’s role in e-learning courses with the traditional position as a role model and classroom teacher. Two main rounds of interviews with instructors involved in the Subject 1 CPL course were undertaken, in 2004 and a year later in 2005. The later interviews informed the development and refinement of some of the concepts that related to changes in the learning environment and the instructor’s role in promoting change.

Uncertainty about the instructor’s role in e-learning and challenges to the instructors’ position as a role model for the trainees encouraged resistance and concerns about e-learning effectiveness. (section 6.2.1). The instructors’ responses included attempts to reclaim their position in training situations to improve training effectiveness (section 6.2.2). Therefore, section 6.2.1 focuses primarily on the concerns evident in 2004 and section 6.2.2 focuses primarily on the changes experienced in 2005. There was evidence of similar concerns in both rounds of interviews indicating an ongoing process of adjustment and reconciliation of the instructor’s role.
6.2.1 Shifting role: teacher to facilitator

The changes in working conditions for instructors that came with e-learning use generated concerns about the reduction in status of the position associated with the traditional instructor role. As discussed in Chapter 5, there was no role identified for instructors in the TTC instructional design specifications, except to facilitate the delivery of the e-learning courses to trainees as self-contained learning within the classroom training periods. The role associated with e-learning facilitator was hierarchically directed from Headquarters RTC, to Senior Instructors (SI) in each of the RTC and to the instructors. Instructors’ experiences with e-learning delivery led to concerns that this was a lesser role than as an instructor and so there was some wariness of the reasons for the support of e-learning use in Army training.

6.2.1.1 Uncertainty and maintaining control

The role of instructors in delivering e-learning courses was not well defined in policy directions or through training management, which encouraged ambiguity about the instructor’s role. There was awareness of the impact on the instructor’s role from within the TTC: ‘Instructors have a regime change. There is a threat to their jobs. Instructors are concerned about where they fit into it and what are we going to do without them’ (Instructional designer interview). There was some resentment and uncertainty relating to the Army’s motives for implementing e-learning from the instructors: ‘But if the Army’s idea is that instructors do not have the background knowledge in subjects, do not want to learn the background knowledge or can’t learn the background knowledge; well perhaps there shouldn’t be instructors’ (Instructor interview).

A lack of top-down management explanations for the use of e-learning courses led more uncertainty about the instructor’s role. While there was no evidence of positions being lost, there were concerns about the lack of communication and understanding about the Army’s motivations for using e-learning courses. These concerns impacted on perceptions of the instructor’s role in training programs and on how the e-learning courses were presented by the instructors to the trainees.

The SI in each RTC was responsible for the supervision of instructors, including directing instructors on their roles and evaluating their progress. The SIs were aware of the concerns
of instructors but they were responsible for implementing top-down decisions: ‘A lot of them [instructors] think that their job is on the way out but like I told them, it is not really, but it is really just how you present the course you’ve got in there’ (Senior instructor interview). The SI guided the instructors on how they were to present the e-learning lessons, with a preference for providing a formally structured face-to-face introduction and conclusion to each of the modules, similar to those used in a traditional classroom lesson:

We use the “During this lesson you will be taught…”, “The reason you are taught this is…” and then headphones go on…At the end of it, we conclude the lesson. Talk about what you have gone through and points to remember once they have actually done that lesson (Instructor interview).

There was diversity in the management styles and approachability of the SI, but overall instructors respected and valued the SIs and their support. There was an awareness of the need to manage the change process for instructors. SIs provided support to instructors to negotiate the use of e-learning, which assisted in reducing some anxiety: ‘I hated computer based learning initially. The SI made a compromise with me and we came out with a happy medium. It was a major shift for me’ (Instructor interview).

Instructors supported the structured face-to-face approach as providing them with some contact with the trainees and providing ‘traditional elements’ of the classroom lessons. There was SI support for providing an instructor-led approach to introduce the e-learning modules to invite trainees to ask questions at any stage during the e-learning lessons. Instructors were encouraged to monitor trainee progress actively during the e-learning classes by checking that they were working on the correct content. The SIs monitored the instructors’ progress and there was concern that not all instructors were using face-to-face instructions or conclusions in the e-learning sessions. Providing verbal instructions in the e-learning class was supported to provide trainees with a focus for the lesson, and to provide instructors with a teaching role to play in the lesson and to maintain face-to-face teaching skills.

Some instructors viewed the directives to change the role from an instructor to an e-learning facilitator as eroding the traditional teaching role in classrooms. The role of e-learning facilitator was perceived positively as an easier role involving less teaching preparation than traditional classroom teaching: ‘Press play, I’m here to supervise’
The facilitator role was also considered ‘boring’ involving little involvement during the class time: ‘Most people use the time to catch up on paperwork that they have piled up’; ‘basically a trained monkey could be an instructor for the purposes of running a CBL lesson’ (Instructor interviews). There was concern that there was some ‘skills fade’ (Instructor interview) as they were losing their face-to-face teaching skills and subject knowledge. Therefore, e-learning delivery was not associated with the requirement to learn new teaching skills.

Trainees experienced more problems technical problems than subject-based problems, and so the facilitator role primarily involved providing technical support more than subject knowledge learning support: ‘We are technical fixeruperers’, ‘We are technical troubleshooters’ (Instructor interview). Some technical instability in the training centres and the requirement to provide trainees with technical assistance was a major issue leading to reduced support for e-learning. Due to ongoing technical problems with computers and networks, instructors had to prepare back-up, face-to-face lesson plans and resources. If there were computer problems, instructors were concerned that they would not be prepared to teach face-to-face, as they had not necessarily rehearsed the lessons.

Dealing with technical issues was a bigger issue at some RTCs that experienced frequent problems, sometimes every day. These problems included unreliable connections to the LAN that was delivering the CD-ROM courses, electricity blackouts and problems with individual computers stalling. While instructors had sufficient technical skills to troubleshoot the use of the e-learning modules, as they did not have the skills to manage computer network issues, they valued the availability of the IT support staff during e-learning class periods.

Maintaining credibility with the trainees created pressure on instructors to make sure they had sufficient knowledge of the content and technical features of the e-learning course so that they ‘did not look stupid in front of the students’ (instructor interview). Support for new instructors to perform this role was minimal in 2004 and involved them going through the modules themselves when they first started with the section. The instructors considered this orientation as adequate for what they were expected to do. Computer literacy was generally not a problem for instructors who used computers as a part of their administration duties. However, each of the e-learning modules had different navigation
features and instructors generally went through the whole course before the residential period to make sure that they were familiar with the content and the technical features. The e-learning courses were also useful for instructors to revise and to update their own knowledge prior to going into the classroom.

Due to routine staff movement, with a fifty percent average turnover of staff every year, and a lack of e-learning experience amongst new staff, in 2005 there was recognition that regular e-learning induction sessions were required. There was a range of levels of instructor preparation and skills for e-learning and the support sessions provided for instructors varied across the RTCs. IT support staff took instructors through the technical aspects of the course with new instructors at most RTCs. At one RTC a mentoring system had been established, where experienced instructors shared experiences with the new instructors and at another RTC a more formal two-week instructor orientation session had been introduced. Before this formal session, the SI evaluated the new instructors to ‘identify their learning shortfalls’ and worked with them as part of their development (Senior instructor interview). The SIs valued providing instructors with an induction program that focused on how to use e-learning to improve training outcomes.

There was a wide range of levels of support and resistance to using e-learning courses. Instructors’ negative experiences of changing training processes and learning outcomes resulted in some resistance to using e-learning and requests for more control over course delivery. As instructors were directed to use e-learning courses, with little involvement or explanation about the decision, there was some resistance to change: ‘the traditional approach to training was OK’ (Instructor interview). There was peer pressure to support e-learning with derogative terms, such as, ‘greybeards’ or ‘dinosaurs’ being used to ridicule resisters. However, overall, instructors could see a role for e-learning in Army training and provided constructive suggestions for improvement.

While the Army provided feedback procedures for instructors to comment on content and delivery issues, these procedures required hierarchical approval processes through the chain of command in order to maintain doctrinal accuracy and consistency. The resulting delays in updating content on the CD-ROMs resulted in incorrect content being delivered, which reduced instructors’ support for using e-learning courses. Furthermore, explaining
content errors to trainees or having students locate errors was considered ‘unprofessional’ (Instructor interview), which instructors felt was reducing their credibility with trainees.

The delivery of e-learning courses challenged traditional face-to-face classroom management strategies. There was concern about reduced involvement in managing e-learning classes compared with traditional face-to-face classes: ‘I am not a passenger; I would like to have some input: it is hard to change the way it is being done’ (Instructor interview). Different perceptions of the flexibility of self-paced learning were reflected in instructors’ classroom management styles. Some instructors provided some flexibility with timing guidelines (e.g. ‘finish three modules in a morning session’), while other instructors required trainees to ‘stay on track’ to complete each module within the suggested period (Instructor interviews).

There was a sense of loss of authority over the class and frustration over trainees rushing through courses and getting up ‘whenever they felt like it’ (Instructor interview) and possibly disrupting other students. However, this issue tended to be a more of a problem for instructors who discussed a preference for face-to-face classroom teaching. Diversity in instructors’ management of e-learning classrooms also influenced trainees’ perceptions of e-learning and necessitated the need for them to be flexible in meeting instructors’ different expectations. However, trainees also experienced diversity in instructors’ skills and approaches in face-to-face classes and practical training.

6.2.1.2 Changing trainee interactions

The more independent learning aspect of e-learning courses challenged instructor and trainee experiences of the traditional authoritarian face-to-face classroom lesson. Prior to 2005, e-learning courses were being used as self-contained learning with only few motivated trainees asking questions about the content and some trainees questioning content correctness. Most questions were about course navigation and other computer related technical problems. Instructors also attributed this lack of trainee questioning to the authoritarian Army culture, where soldiers ‘do not want to look dumb’ (Instructor interview), similar to the situation occurring in face-to-face classrooms.

There were concerns the larger size of e-learning classes, compared with face-to-face classes, there would be add barriers for trainees to ask questions: ‘You can’t ask a box a
question’ (Instructor interview). Due to the reduced questioning between trainees and the instructors, there was a greater sense of isolation than in a traditional face-to-face classroom situation. However, there was also an alternative view that using e-learning assisted trainees who may feel intimidated to ask questions:

The computer allows them to replay. Whereas, when we deliver in instructional style they would be less inclined and feel too intimidated for a variety of reasons to say, “can you please say that again?” With the computer, they can replay aspects. That is a definite positive for them (Instructor interview).

Nevertheless, the limited opportunity for instructor-initiated interaction was thought to reduce training and learning opportunities. Instructors valued questioning to determine trainee understanding and progress in the class, which was a feature of traditional face-to-face classes: ‘Face-to-face with students provides better learning. They pay more attention. You can fire questions at students: target students who may not be listening’ (Instructor interview). Instructors also thought that asking questions during the e-learning period broke up the lesson and made it less monotonous. As developing good verbal communication skills was one of the learning outcomes required in the Corporal course, being able to adapt questions ‘to see how they communicate’ and ‘who can offer an opinion’ was valued in training (Instructor interviews). With e-learning delivery there was more opportunities content than in face-to-face classes for trainees to independently engage and interact with the content. However, e-learning delivery was reducing the interaction between instructors and trainees, which was valued as part of the traditional training process.

While establishing trainees’ learning progress was an issue with face-to-face classes, it was considered more difficult with e-learning delivery. In e-learning classes there were limited opportunities to ask trainees questions to test understanding or to adapt the questions in the lesson to individual needs: ‘You can tell by looking at their faces whether they understand before you move on. Only a person can do that. A computer cannot do that’ (Instructor interview). Less interaction with trainees in e-learning lessons reduced the instructors’ opportunity to understand individual abilities and weaknesses and to provide assistance. There was an alternative viewpoint that e-learning classes freed up the instructor’s time to provide attention for trainees’ inquiries. Understanding individual
trainee learning needs was a concern for instructors and valued as a part of the traditional teaching role, which was challenged with e-learning use.

Instructors valued being an authority and role model by mentoring trainees and they felt that this relationship was being reduced with independent e-learning. Face-to-face training was valued as providing an opportunity to share Army experiences or ‘war stories’ (Instructor interview) with trainees of their knowledge and experience. ‘With face-to-face…you certainly get the feeling that you are passing on your knowledge and you are contributing to the learning of the students. With CBL you don’t get a sense of satisfaction in any way, whatsoever’ (Instructor interview). As the Corporal course required trainees to gain leadership and training competencies, there was concern that trainees were experiencing less face-to-face examples of these skills: ‘There is a difference in the Army. The instructor needs to set an example’; ‘We are trying to build leaders - to show confidence’ (Instructor interviews). With a sense of erosion of instructor skills and position, there were also direct consequences in how e-learning was introduced to trainees in some sessions, which influenced subsequent trainee course feedback on courses.

E-learning was considered a positive experience, as it provided modelling of behaviour to Army standards, which all instructors might not provide consistently, and it provided standardised course delivery. Alternatively, it was argued that different face-to-face instructors could provide a range of instruction styles that the trainees can reflect on, and model. There were concerns that the enculturation aspect of mentoring in Army training was being eroded with the independent learning features of e-learning and instructors were attempting to understand the impacts for themselves and trainees.

6.2.2 Reclaiming position: adjustment and reconciliation

The RTC managers and some of the training managers indicated a need to define the role of e-learning: ‘E-learning is more than the course package. There is a need to understand the role of e-learning in training’ (Training manager interview). From 2004 to 2005 the main changes in the learning environment were the increased use of mixed modes of delivery and the implementation of more instructor-led e-learning delivery. While there were individual differences in practices and perspectives of e-learning, there was subsequently a more positive attitude from instructors about using e-learning courses.
6.2.2.1 Re-establishing e-learning role

Instructors’ concerns about the relevance and currency of e-learning modules and changes in management led to increasing autonomy within training centres to negotiate the use of e-learning modules. Instructors valued the increasing autonomy to negotiate with the Senior Instructor (SI), who could ‘assess the situation on the ground’ (Instructor interview) on managing the delivery of particular sections of e-learning modules. However, instructors’ experiences of requesting changes about course delivery also reflected the personality and experiences of the individual RTC managers and the SI.

A greater sense of instructor confidence about managing e-learning was evident where there was some local decision-making over course delivery mode, including the options for using face-to-face classroom delivery, practical sessions or e-learning modules. Modifications in delivery method by the instructors had to meet the training package specifications to comply with training requirements and to maintain standardised training outcomes, however, changes in course delivery mode could be negotiated with the SI. Consequently, various models of e-learning and face-to-face delivery were emerging in the training centres based on instructors’ preferences as negotiated with the SI, and in response to learners’ needs.

By early 2005, most RTCs had examined the Subject 1 CPL e-learning course and many practical skills modules were targeted for additional face-to-face sessions to supplement or replace e-learning: ‘We’ve got permission to do a lot of things face-to-face. And the rest of the stuff that we believe enhances the learning skills or ability of the trainee we keep on CBL’ (Instructor interview). The outcome of this review process was the consensus that it was not a matter of using either face-to-face or e-learning sessions, but that there was a need to understand the benefits of both methods. Some instructors would have preferred not to use e-learning at all due to the need for learning practical skills and their preference to interact face-to-face with the trainees. However, there was overall support for using some e-learning courses in Army training:

   Basically, the system works. There are problems on both sides. There are problems with total CBL and there are problems with total face-to-face. They are the by-gone years. I guess that on either side, it is the retention of information by the individual that counts (Instructor interview).
By mid 2005, there were reports of an overall balance of about sixty percent e-learning to forty percent practical lessons in most RTCs as opposed to the predominantly e-learning sessions run previously. Undertaking this review process also had a confirming effect by establishing the value of using e-learning for some modules when previously there were doubts about their usefulness.

By the end of the data collection period in mid 2005, there were diverse models of e-learning course delivery across and within RTCs. Most of the RTCs took advantage of trainees completing the e-learning modules faster than the TTC allocated period. The extra time was used to introduce short face-to-face classroom or outside practical sessions close to the relevant e-learning session, often on the same day. Other RTCs had extended the practical session at the end of the two-week, e-learning period to one day. Using additional face-to-face lessons was described positively by instructors as ‘enhancing’, ‘embellishing’, ‘supplementing’, ‘reinforcement’, ‘reiteration’, ‘backing up’ or ‘confirming’ e-learning. However, there was no consistency in the use of these terms, which indicated regional perspectives and the regional implementation of these changes.

Consequently, various models of e-learning delivery emerged in the training centres based on training preferences and learners’ needs. These models included: replacing e-learning with face-to-face classroom teaching for some modules, using the e-learning modules as independent learning and incorporating more practical training to reinforce the learning, using parts of e-learning modules in instructor-led classroom sessions or replacing some e-learning content with practical training. Accompanying the introduction of more practical and face-to-face classes in the residential period was a shift to less independent learning situations that reflected the traditional instructivist approach. Therefore, the e-learning lessons were integrated into the traditional training expectations of instructors. The integration was associated with greater sense of confidence about the role of e-learning courses within the training program.

6.2.2.2 Re-establishing instructor’s role

The mixed modes of course delivery adopted reflected traditional instructor-led lessons rather than shifting to more learner-centred approaches. Improving support for using e-learning content was based on a move towards the traditional didactic teaching delivery approach. While SIs encouraged instructors to structure the presentation of e-learning
modules, some instructors had changed to an entirely instructor-led classroom delivery approach for some e-learning modules. This approach involved the instructor designing a lesson plan and directing trainees to access short sections of an e-learning module from an individual computer, or from a data projector, and then returning to the instructor’s explanations and directions.

Therefore, in some classrooms, the independent and self-paced learning aspects of the e-learning modules were replaced by more instructor direction and control.

There were varied levels of the control used by instructors to guide trainees through the modules. There was some support for presenting the e-learning modules as an equivalent to a PowerPoint presentation in face-to-face classes. This approach provided the instructor with increased control of the teaching process. Using the data projector assisted with troubleshooting trainees’ navigation and technical issues. In other situations, the trainees covered some of the e-learning module content, did some of the e-learning activities independently and then broke into groups to discuss issues or do other learning activities. This diversity in delivery approaches reflected instructors’ perspectives of trainees’ learning needs and individual instructor’s preferences for training.

A sense of improved instructor control over classroom e-learning delivery was also associated with more control over the progress of the class: ‘That works a lot better and the class moves as a single entity and you can sign them off on this and say they are ready for assessment. That works very well’ (Instructor interview). The more didactic teaching approach was defended in terms of ensuring that the trainees had covered the content. This approach also enabled instructors to confirm trainees’ understanding of the content by asking questions. The shift back to more instructor-led teaching was not seen as replacing e-learning but supplementing it: ‘Then we have big screens as well, so I can stop people and talk and carry on. It’s (e-learning) great but it just needs that finishing touch with a bit of hands on, I think’ (Senior instructor interview). Therefore, e-learning course delivery had been adapted to fit within the traditional authoritarian delivery approach.

There was a general acceptance that e-learning courses were there to stay and that they were ‘a part of the future’ (Instructor interview). Alternatively, there was some cynicism that developing the e-learning courses had cost a great deal of money and it was unlikely
that they would be withdrawn from use. There was an awareness of the instructor’s role in balancing organisational and trainee learning needs:

Yes, we are at a sort of happy medium. Because at the moment after each block of lessons on CBL we back it up with a practical activity which reinforces what they learnt. We are compromising what we fully want but we are balancing what Headquarters Training wants and what the trainees want (Instructor interview).

The impact of more independent learning using e-learning courses on the social and cultural aspects of training and learning was an incentive for initiating change. The use of more mixed mode delivery approaches reflected an adjustment in the instructor’s role that reconciled the advantages of using e-learning courses and the advantages of using the traditional face-to-face training approaches.

6.3 Summary and recommendations

The main issues for respondents relating to the instructor’s role factor are summarised and recommendations for developing effective e-learning based on these experiences are presented.

6.3.1 Shifting role

The directives to deliver e-learning courses as independent learning packages facilitated by instructors challenged the traditional instructor role in Army training. The instructors’ experiences of e-learning were being reconciled with the top-down directions for the delivery of e-learning. The additional uncertainty of technical problems was adding to the stress and concerns about e-learning effectiveness. With continual changes in the workforce, the provision of formal induction programs was valued for new staff members. The uncertainty about the organisation’s reasons for changes to instructors’ roles was encouraging areas of resistance and concerns about e-learning effectiveness.

Recommendation:

Understanding the position of instructors in the traditional training culture assists in defining the role of instructors to encourage effective e-learning.

The traditional authoritarian role of instructors being a mentor for trainees to demonstrate leadership and training skills was challenged with e-learning use. There was a sense of greater isolation from the training and learning processes with fewer opportunities for
interaction with the trainees. However, due to their authoritative position, instructors were able to influence directly trainees’ perceptions of e-learning.

**Recommendation:**

Understanding the impact of e-learning delivery on the instructor’s role will reduce uncertainty and facilitate effective learning.

### 6.3.2 Reclaiming position

Working within the organisational hierarchical communication structures, instructors gained upper level support to reconcile e-learning delivery policy with experiences of e-learning delivery. This review process reflected the local priorities and preferences of management balanced with the organisation’s requirements for learning objectives and competencies. Although various mixed delivery models emerged, these approaches shifted e-learning to reflect the traditional instructor-led training.

The instructor’s role had been reclaimed through readjustments in course delivery approaches within the expectations of the training culture, resulting in a greater sense of confidence about the role of e-learning in the training centres.

**Recommendation:**

Reconciling shifts in the instructor’s role with the expectations of the training culture assists in encouraging support for the role of e-learning courses.

### 6.4 Conclusions

The concerns raised by respondents relating to the instructor’s role were presented in this chapter. These issues were discussed in relation to two main influences on e-learning effectiveness - the changes in the instructor’s role and the adjustment processes required for effective e-learning delivery. A summary of the main issues and recommendations for developing effective learning outcomes were presented. The concerns discussed in this chapter informed the development of recommendations for practice. This analysis also contributed to the development of the model presented in Chapter 8.
Chapter 7    Learners’ needs

7.1 Introduction

This chapter discusses the main concepts that informed the generation of the learners’ needs factor. Figure 7.1 outlines the focus this chapter and the relationship between the factors influencing e-learning effectiveness.

![Diagram showing the main factors and core concern]

Several concepts emerged from the respondents’ concerns about learners’ needs that were influencing the design, delivery and learning processes associated with e-learning courses. The following analysis is firmly grounded in the respondents’ perspectives. Recommendations for practice are presented at the end of the chapter.

Therefore, this chapter:

- discusses the main concepts that informed the generation of the learner’s needs factor (7.2)
- presents a summary of the main issues and recommendations based on these experiences (7.3)
- presents a conclusion to the chapter (7.4).
7.2 Learners’ needs main concepts

The main concepts and their properties relating to the learner’s needs factor are summarised in Figure 7.2.

Trainees were viewed as the end consumers of e-learning courses, which reflected the authoritarian and competency-based training culture. However, contentions existed between the assumptions made about trainees’ characteristics and their learning methods, and the trainees’ experiences of e-learning.

Trainees were selected for promotion and invited to undertake the Subject 1 CPL course, which included the compulsory e-learning component. The Regular soldiers undertook the e-learning component in classrooms facilitated by an instructor as a concentrated two-week block during a residential period. Some opportunities for me to observe and participate in e-learning classes with the trainees also provided data about learners’ needs. The Reservists were given the CD-ROM course package for home use and trainees without computer access were provided with a laptop computer to take home. The Reservists’ course was similar in content and design to the one undertaken by the Regular soldiers, with the additional experience of managing distance learning. Consequently, the distance learning Reservists trial provided the opportunity to establish and compare the issues being raised about e-learning course use in distance learning to residential use. The Reservists’ experiences highlighted some of the general issues relating to learners’ needs in e-learning courses.
As discussed in section 3.4.3.4, the data collected from trainees included both quantitative and qualitative sources. The constant comparative analysis process allowed concepts to emerge from all data sources. Therefore, both statistical data and quotations are provided to illustrate the issues and concerns that were emerging about learners’ needs. The trainee respondents for this research were one cohort of Regular soldiers undertaking the Subject 1 CPL course and a group of active Reserve soldiers undertaking a trial distance learning Subject 1 CPL course. The focus of data collection and analysis was to compare the issues arising rather than comparing the two trainee groups. However, the trainees’ experiences of different delivery modes highlighted the assumptions and experiences of catering for learners’ needs using e-learning courses.

While all groups of respondents provided perspectives of trainees’ learning needs, this chapter focuses predominantly on the trainees’ perspectives and concerns. The expectations and experiences of learners’ characteristics are discussed in section 7.2.1 and the strategies used by trainees to manage their e-learning course experiences are discussed in section 7.2.2.

### 7.2.1 Learners’ characteristics: standardisation and diversity

Trainees were treated as a homogeneous group regardless of evidence of differences in age, gender, previous knowledge and experiences. The structured and standardised training approach facilitated the development of consistency in soldiers’ knowledge and abilities for field operations: ‘in the army, aptitude and trainability are built into trainees’ (Training manager interview). While the e-learning courses were valued for providing standardised content for all trainees regardless of background, experience or location, instructors recognised that trainees had individual characteristics: ‘The lesson is the same; the person we are talking about is completely different: that will also change from course to course’ (Instructor interview).

Individual differences in maturity and discipline were also claimed to influence trainees’ ability to focus on the more independent learning required in e-learning course delivery. Instructors also considered that e-learning courses would suit trainees with less educational experience as they provided a structured path for learning. As many trainees in the lower ranks have low education levels, face-to-face class delivery can present
problems: ‘they can be lost in face-to-face lectures where the information is presented too fast for them’ (Instructor interview). Therefore, balancing the need to provide standardised training and to respond to the learning needs of individuals and different groups of trainees was an issue influencing all training situations.

7.2.1.1 Understanding learning needs

The content presentation formats of the e-learning courses reflected the TTC instructional designers’ understanding of learners’ needs. Instructional designers indicated that there were assumptions made about the homogeneity of learners’ characteristics and that more understanding of the characteristics of groups of learners would have assisted in the design of appropriate e-learning courses. Based on the TTC research into learning styles and learning theories, the e-learning courses contained an integration of a wide variety of content presentation formats (e.g. audio, text, animation, and video) that were aimed at catering for a range of learning styles. There was confidence within the TTC that the e-learning design provided effective training experiences: ‘This training should provide a wider range of learning - seeing it and doing it’ (Instructional designer interview).

Instructional designers included a range of multimedia activities and voice-overs to complement the text content in the e-learning lessons. The focus on including rich multimedia was based on their understanding of lower reading literacy levels and predominantly auditory and visual learning styles in the lower trainee ranks. E-learning courses that were more text-based were designed for higher ranks of soldiers, who it was assumed would have higher educational levels and experiences than the Corporal trainees. Therefore, there was a priority to provide a range of media presentations in the design of e-learning courses to cater for different learning styles. Instructors recognised that trainees had different learning styles and that trainees generally preferred practical training sessions: ‘It is more people’s capacity to learn. Some people do not have that discipline, the aptitude to take in information. Some people are better at practical exercises’ (Instructor interview).

Based on the assumptions being made by instructional designers about trainees’ learning preferences, four questions from the VARK (Fleming 1997) learning style test were included in the Regular soldier pre-course questionnaire. When the responses for the four questions were totalled, the overall learning preference for the group was determined. This
analysis indicated that as a group, there was a preference for kinaesthetic activities, followed by auditory, visual and reading (Figure 7.3).

<table>
<thead>
<tr>
<th>Learning style</th>
<th>Responses*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>Kinaesthetic</td>
<td>104</td>
</tr>
<tr>
<td>Auditory</td>
<td>89</td>
</tr>
<tr>
<td>Visual</td>
<td>68</td>
</tr>
<tr>
<td>Reading</td>
<td>61</td>
</tr>
</tbody>
</table>

Figure 7.3 Learning styles preferences using four VARK (Fleming 1997) test questions, Regular soldiers, pre-course questionnaire (n=54)
*Multiple responses were allowed

While only a very limited sample of VARK questions were used, the trainees’ responses indicated that further research into learning mode preferences of different groups of trainees would be useful to understand effective training delivery.

The trainees indicated a preference for practical field-based training rather than classroom-based sessions and their suggestions indicated a need for more opportunities to practice skills in the field: ‘We don’t want to sit in the classroom. Infantry Corp don’t like being indoors’ (Regular soldier, pre-course questionnaire). Therefore, the reduction in time available for practical experience with e-learning course use was a main concern for trainees. However, there were also indications that trainees found that e-learning in classrooms provided a more interesting and varied learning environment that the traditional face-to-face classroom situations.

Providing varied and interactive features in the e-learning courses was also valued for catering to different learning needs. There was support for the inclusion of multimedia features in the design of the e-learning that were relevant to learning needs. Trainees found that the more text-based modules were quicker to go through and easier to use to answer the formative quizzes. There was a range of support for the different content formats in the e-learning course to assist learning with a higher preference for the inclusion of videos and animations followed by reading text content, doing the online learning activities and listening to the audio content (Figure 7.4). Therefore, learning was associated with the provision of relevant and interesting content and doing the formative assessments.
Overall there was support for using e-learning with the majority of the Regular soldier respondents (72.4%) indicating that they liked e-learning (Figure 7.4). Individual learning style preferences influenced perceptions of the usefulness of e-learning content presentation formats. Trainees referred to the various presentation formats in the e-learning modules that were assisting their learning, for example: ‘Audio and text both helpful for learning - the text is more helpful’; ‘It is hard to learn from the text. Some things you have to see and hear’; ‘The computer models of positions are effective for learning’; ‘The multimedia keeps you interested: it is easier to take into your mind-easier to remember - stays in your mind more’, I will remember the visual images in the practical. I have a visual memory’ (Reservist interviews). Trainees were aware of their learning preferences and related these preferences to their e-learning experiences. Therefore, presenting multiple content formats in the course catered to a range of learning styles and an improved understanding of learning style preferences would further inform effective instructional design.

Providing relevant and interactive graphical content encouraged course participation and the learning of practical skills. The interactive learning activities in the e-learning modules provided a positive learning experience in terms of providing background practical skills and a more interesting learning environment than a face-to-face classroom: ‘I go back through the package to do the games again - do the fun bits. I enjoy the games. I have played some of them eight times. That is what learning is about - you learn more. This is true especially for soldiers’ (Reservist interview). The graphical content was considered more valuable than text content to provide background for practical skills: ‘The
multimedia is more relevant for the outdoor practical activity. It is handy to see it. It presents different approaches, which is good’ (Reservist interview). However, the overall preference was for the inclusion of more practical training to reinforce or replace e-learning content: ‘The designers of the package must have been excited by the possibilities of CBL but they need more applied aspects of the course’ (Regular soldier, post-course questionnaire).

While trainees appreciated the richness and interactivity of the multimedia, there were issues with the lack of control over the e-learning features in the courses. Some trainee respondents had difficulty managing multiple sensory inputs: ‘I find that I have to go over it two to three times - there is too much going on the screen’ (Reservist interview). In particular, text and audio content presented together was found confusing for about a third of the Regular trainee respondents (Figure 7.4) and prolonged the study time for some trainees as they wanted to either read or listen but not both: ‘It is annoying. As I am trying to read, I find the audio annoying, distracting’ (Reservist interview). Sometimes the text and audio content presentations were different, which was distracting. The provision of content in different media formats was also confusing for trainees who had difficulties switching focus across the media. Ensuring that content in the course was covered in all media and providing directions for turning off the audio, particularly when it was duplicating text were included in trainees’ suggestions for improvement.

Therefore, while the e-learning courses were designed based on TTC research into learning theories and learning styles, trainees’ experiences with different media formats and combinations of formats did not necessarily correspond with these expectations. Trainees were able to provide feedback on these features in the course evaluations, however there was resignation to the fact that course design changes would take a long time to complete.

While motivation to complete the e-learning course was not considered an issue as trainees wanted to learn in order to be promoted, instructional designers considered that the inclusion of motivational music and visuals were essential to encourage trainee engagement in the course, particularly for the lower ranks. There was trainee frustration that some of the multimedia content was irrelevant, too time consuming to watch and repetitive that slowing progress through the course. Reservists, in particular found the
length of some of the video and animation features frustrating, as they had to manage their limited available study time. Therefore, there was a need to balance the provision of interesting and motivational multimedia aspects with the relevance and pace of learning to improve flexible learning options.

There was a wide range of individual preferences for reading text, indicating differences in learning style preferences and reading literacy skills. Reading literacy was mentioned within the TTC, as the Army had become increasingly aware of literacy issues for some of the trainees, due to lower education levels, dyslexia and other reading problems. Instructors also indicated that some trainees (with estimates of up to twenty percent) had reading literacy and numeracy problems that were evident in both e-learning and in face-to-face classes. However, there was no formal program to assess literacy skills being used in the Army.

Despite the knowledge of some literacy problems, the e-learning formative assessments required reading and accurate spelling skills, which was a concern for some trainees. In particular, the written formative assessment answers required trainees to provide the correct spelling, word spacing and the exact words used in the e-learning module to be recorded as correct by the e-learning application. This technical aspect caused concerns and stress, exacerbated by any literacy problems. There was considerable frustration expressed about these features of the e-learning assessment tasks that added to the pressure of the need to gain sixty percent in the formative assessments. Trainees’ experiences of face-to-face classrooms were that they could provide verbal answers, instructors would allow for spelling mistakes and the use of synonyms, and that broader descriptions of answers would be considered correct. Therefore, the design of the e-learning modules conflicted with the expectations and abilities of trainees. In particular, course design features that influenced assessment participation and outcomes were a focus for concern.

Despite the availability of the different media in the e-learning course and a lower preference for reading, trainees also took hand-written notes to record the main points for assessment tasks (Figure 7.4). This question was added to the Regular soldiers’ questionnaire as many of the Reservists mentioned that taking notes while they were doing the e-learning modules helped them to learn and would help them with revision.
The time gap between completing the e-learning modules and doing practical training and summative assessment was a reason provided for note taking, particularly for Reservists who had up to a three-month period to remember the e-learning content. Observations of the e-learning classes also indicated that instructors were encouraging trainees to make notes while they were progressing through the modules. While an online notepad was provided in all of the modules for trainees to copy and paste text for future reference, very few respondents indicated that they used this feature and instructors were observed directing trainees not to use this tool as it was ‘complicated’.

Writing notes was also related to the trainees’ need to actively participate in the learning process: ‘Writing helps me with learning rather than just reading a screen.’; ‘It keeps my mind active and thinking’; ‘Because I actually have to think about what I'm writing so I absorb info better’ (Reservist interviews). Making notes also enabled trainees to manage the available class time to complete the modules: ‘I also find it difficult to keep up with the class under pressure’ (Regular soldier, post-course questionnaires) and as revision notes for the summative assessment: ‘I can reflect back and confirm’ (Regular soldier and Reservist interviews). Note taking had become a major activity for some trainees (one Reservist had made two exercise books of notes) to help them to remember and revise. While trainees considered that making notes improved their learning capabilities, this activity also slowed e-learning module completion rates.

Instructors compared e-learning classes with traditional face-to-face classes where trainees were given more notes to keep and time was provided to write their own notes. There were also suggestions from trainees for the provision of printed notes in a structured lesson format with the support of multimedia modules to assist learning as an alternative course delivery mode, particularly for Reservists. However, Reservists reported after the course that most of them had not used their notes for revision. Therefore, note taking was associated with improving learning capabilities on previous training experiences. However, the usefulness of note taking for improving learning retention was uncertain.
7.2.1.2 Understanding computer skill needs

Assumptions were also made by the TTC staff that the trainees were computer literate as they were ‘a part of Generation X’ (Training manager interview). However, as this was an all-corps course, trainees had a wide range of Army experience providing them with a variety of skills and knowledge, including computer experience. While most trainees expressed confidence in using computers, and some Reservist respondents had completed tertiary computer courses, there were respondents with limited experience in using basic computer functions (e.g. opening and closing computer, saving files, virus management, familiarity with Windows, entering login and password information). The less computer literate trainees also had problems with the wide range of navigation tools (e.g. rollovers, pull down menus, drag and drop) used in the course that slowed their progress in the course.

Instructors’ reports of computer illiteracy problems for at least twenty percent of trainees in all course cohorts were confirmed by the trainees’ feedback. At one RTC, the instructors reported the computer illiteracy rate was closer to thirty percent, which they attributed to regionally lower educational levels and family income levels. The questionnaire results supported the instructors’ reports of computer literacy rates with about twenty percent of respondents indicating that they did not have access to a computer at home and eighteen percent of Reserve soldier respondents lacking confidence in their computer skills (Figure 7.5).

<table>
<thead>
<tr>
<th>Pre-course questionnaire</th>
<th>Respondent</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have access to a computer at home?</td>
<td>Regular soldiers</td>
<td>77.8</td>
<td>22.2</td>
</tr>
<tr>
<td></td>
<td>Reserve soldiers</td>
<td>81.3</td>
<td>18.8</td>
</tr>
<tr>
<td>Do you have access to a computer at work?</td>
<td>Regular soldiers</td>
<td>88.9</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>Reserve soldiers</td>
<td>68.8</td>
<td>31.3</td>
</tr>
<tr>
<td>I feel confident that I have sufficient computer skills to do the course.</td>
<td>Regular soldiers</td>
<td>81.2</td>
<td>18.8</td>
</tr>
<tr>
<td></td>
<td>Reserve soldiers</td>
<td>81.2</td>
<td>18.8</td>
</tr>
</tbody>
</table>

Figure 7.5 Trainee access to computers at home and at work, Regular (n=54) and Reserve soldiers (n=16), pre-course questionnaire results
* This question was not asked in the Regular soldier pre-course questionnaire.

Regular soldiers had more access to computers at work than at home or in base accommodation than the Reservists (Figure 7.5). Infantry-based soldiers reported that they were less likely to have computer skill training in their job than clerical staff, or the
infantry tasks could involve specialised computer skills that may not transfer to e-learning. For example, ‘they might be operating computers for their job but different types of computers. These ones calculate where bombs go off and things like that’ (Regular soldier, pre-course questionnaire). Similarly, Reservists indicated that the computers they used in civilian work were for specific purposes, including cash registers, or simple data entry tasks, such as inventory inquiries. In these work positions, the respondents were not usually responsible for understanding or fixing computer problems.

The wide range of computing skills was also evident to the trainees, which reduced confidence in their ability to complete the course effectively. Some Reservists experienced technical problems in using the e-learning packages, which required learning new skills. Trainees in classrooms were stressed when they experienced problems in using the e-learning modules due to their computer inexperience. Therefore, despite evidence of significant differences in confidence and skills in computer use, there was no pre-course knowledge of these differences built into the Army’s preparation for e-learning courses.

Experiences of frequent technical problems during the course led to frustration and worry about completing the modules. An orientation session on using the e-learning course was provided to trainees on the residential day prior to course commencement. This half-day session was generally adequate for trainees to learn to navigate the modules. However, the technical problems, such as computers and networks stalling, that were experienced during the e-learning course both in the classroom and at home reduced trainees’ confidence to participate effectively in e-learning modules.

While Regular soldiers had instructors and technical assistance in the classroom, the Reserve soldiers had to be more independent. Reservists had a toll-free 1-800 number through to the RTC technical assistant but most technical problems had to be solved themselves: ‘I mucked around and fixed it’ (Reservist interview). Some Reservists reported an improvement in their technical confidence at the end of the course from these experiences. Therefore, technical problems were commonly experienced that trainees had to manage, either with some assistance or independently, depending on the learning situation. As remedies, trainees and instructors suggested identifying less computer literate trainees and providing them with additional support or computer orientation.
With the trials to move to more Web-based course delivery, this research also asked about trainee experiences with accessing the Internet and using Internet tools (Figure 7.6). While most trainee respondents used the Internet, Figure 7.6 indicates that just under half (44%) of both the Regular soldier and Reservist respondents reported less than weekly use of the Internet. The relatively high percent of low or non-users of the Internet could indicate possible issues for the use of Internet tools (e.g. email) or Web-based delivery, in the future.

<table>
<thead>
<tr>
<th>Pre-course questionnaire</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you use the Internet?</td>
<td>Regular soldiers</td>
</tr>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Every day</td>
<td>18.5</td>
</tr>
<tr>
<td>Almost every day</td>
<td>27.7</td>
</tr>
<tr>
<td>Weekly</td>
<td>20.4</td>
</tr>
<tr>
<td>Fortnightly</td>
<td>11.1</td>
</tr>
<tr>
<td>Monthly</td>
<td>7.4</td>
</tr>
<tr>
<td>Less often than monthly</td>
<td>1.9</td>
</tr>
<tr>
<td>Never used</td>
<td>13.0</td>
</tr>
</tbody>
</table>

Figure 7.6 Trainee use of the Internet, Regular (n=54) and Reserve soldiers (n=16), pre-course questionnaire results

There was an assumption within the TTC that these trainees would be experienced at using computer tools, including computer games that formed the basis of the e-learning scenario-based multimedia e-learning activities. However, the questionnaire results indicated a wide variation in self-reported computer skills relating to online communications and game playing (Figure 7.7).

<table>
<thead>
<tr>
<th>Computer skill</th>
<th>Respondent</th>
<th>Never used</th>
<th>Very low</th>
<th>Low</th>
<th>Average</th>
<th>High</th>
<th>Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>Regular</td>
<td>3.7</td>
<td>9.3</td>
<td>3.7</td>
<td>44.4</td>
<td>27.8</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>Reserve</td>
<td>0</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
<td>25.0</td>
<td>37.5</td>
</tr>
<tr>
<td>Web browsers</td>
<td>Regular</td>
<td>7.4</td>
<td>13.0</td>
<td>9.3</td>
<td>31.5</td>
<td>29.5</td>
<td>9.3</td>
</tr>
<tr>
<td></td>
<td>Reserve</td>
<td>0</td>
<td>12.5</td>
<td>0</td>
<td>31.2</td>
<td>25.0</td>
<td>31.3</td>
</tr>
<tr>
<td>Online forums</td>
<td>Regular</td>
<td>14.8</td>
<td>22.2</td>
<td>20.4</td>
<td>31.5</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Reserve</td>
<td>43.8</td>
<td>6.3</td>
<td>0</td>
<td>18.7</td>
<td>18.7</td>
<td>12.5</td>
</tr>
<tr>
<td>Online chat</td>
<td>Regular</td>
<td>42.6</td>
<td>18.5</td>
<td>9.3</td>
<td>16.6</td>
<td>5.6</td>
<td>7.4</td>
</tr>
<tr>
<td></td>
<td>Reserve</td>
<td>37.5</td>
<td>6.3</td>
<td>0</td>
<td>12.4</td>
<td>43.8</td>
<td>0</td>
</tr>
<tr>
<td>Single-player games</td>
<td>Regular</td>
<td>29.6</td>
<td>16.7</td>
<td>3.7</td>
<td>16.6</td>
<td>20.4</td>
<td>13.0</td>
</tr>
<tr>
<td></td>
<td>Reserve</td>
<td>6.3</td>
<td>12.5</td>
<td>0</td>
<td>31.2</td>
<td>31.2</td>
<td>18.8</td>
</tr>
<tr>
<td>Multi-player games</td>
<td>Regular</td>
<td>50.0</td>
<td>9.3</td>
<td>5.6</td>
<td>11.0</td>
<td>7.4</td>
<td>16.7</td>
</tr>
<tr>
<td></td>
<td>Reserve</td>
<td>37.5</td>
<td>0</td>
<td>12.5</td>
<td>12.4</td>
<td>31.3</td>
<td>0</td>
</tr>
<tr>
<td>Computer file management</td>
<td>Regular</td>
<td>5.6</td>
<td>16.7</td>
<td>3.7</td>
<td>38.8</td>
<td>24.1</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>Reserve</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Figure 7.7 Trainee reported competence with computer tools, Regular (n=54) and Reserve soldiers (n=16), pre-course questionnaire results * This question was added to the Regular soldier questionnaire based on Reserve soldier interview feedback
While self-reporting can be subjective, it can be interpreted as an indication of confidence levels. The question asked was: How would you rate your level of competence in the following computer skills? Assumptions made by the TTC staff about generation X playing computer games were associated with the design of scenario-based and problem-solving multimedia presentations. However, a majority of Regular soldier respondents indicated little or no experience with online forums or multi-player games (Figure 7.7). A lack of experience with navigating around graphics-based programs could be related to the difficulties raised by trainees who had problems understanding the screen navigation involved in scenario-based e-learning situations.

Computer literacy problems also included some issues with file management (e.g. opening files, saving files, navigating file management tools) that were required to save e-learning assessment results. Reservists indicated that although they had some experience in using computers at work, they were not necessarily competent in using file management skills. Therefore, the assumptions of computer literacy included in e-learning design negatively influenced some trainees’ experiences and confidence in using e-learning modules. In contrast, trainees with computer experience found the lack of flexibility in accessing content and learning activities frustrating as it slowed their progress.

There was also recognition that trainees required a range of computer skills, particularly in higher ranks, in many Army activities. These computer skills were mostly learnt on the job through on-the-job mentoring. Providing some formal accreditation of computer skills was suggested by instructors as a way to encourage all trainees to gain basic computer skills and to improve their confidence with e-learning and using computers in the workplace. Therefore, using e-learning courses had introduced the need for more computer-based skills than were required by traditional Army training methods. There was an association made between changes in the workplace and the need for computer skills. However, while specific technical skills were being learnt on-the-job, e-learning related technical skill development was not being adequately provided. Plans to use mobile learning technologies in the Army will need to consider the diversity in trainees’ experience and abilities in using these technologies.
7.2.2 Learning strategies: expectations and experiences

Trainees compared e-learning courses favourably with the traditional instructor-led classroom course in terms of e-learning providing more opportunities for interaction with the content. However, the trainees were concerned about the reduced contact with instructors and the reduced amount of practical training with e-learning course use. There were differences in experiences between the two trainee respondent groups due to the distance delivery of the Reservist course over three months compared with the two-week residential period for Regular soldiers. However, the overall concerns were similar and indicated that there was a preference for using more practical-based training or the integration of practical-based training to reinforce the e-learning courses.

There was some support for using e-learning modules to replace face-to-face classroom lectures as e-learning provided a more interesting learning environment: ‘Classrooms can be boring. Just sitting there for forty minutes. People go to sleep’; In face-to-face classrooms there are too many distractions. I would not pick up as much information’ (Trainee interviews). Therefore, trainees were comparing e-learning courses with traditional training modes and developing learning strategies within the constraints of the course delivery requirements to facilitate effective learning opportunities.

7.2.2.1 Defining learning effectiveness

As other respondent groups were making judgements about the comparative usefulness of e-learning courses and traditional face-to-face classroom delivery, this aspect was included in the trainee questionnaires. Trainees made comparisons of experiences of the e-learning course with previous experiences of Army training requirements in the questionnaire replies and in the open-ended answers, and in the Reserve soldier interviews. Effectiveness was viewed by the trainees as the capabilities of the e-learning course to provide relevant content and perceptions of retention of the e-learning course content for the summative field assessment.

A third of the Regular soldier respondents and nineteen percent of Reserve soldier respondents had previous experience with e-learning prior to the Subject 1 CPL course in the Army or outside, such as university courses (Pre-course questionnaires). Therefore, the
pre-course responses in Figures 7.8 and 7.9 predominantly reflect expectations about e-learning courses based on a lack of experience with e-learning.

<table>
<thead>
<tr>
<th>Questionnaire statement</th>
<th>Respondents</th>
<th>Not confident</th>
<th>Fairly confident</th>
<th>Moderately confident</th>
<th>Very confident</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-course: I am confident that I will learn using CBL.</strong></td>
<td>Reserve soldiers</td>
<td>6.3</td>
<td>18.8</td>
<td>25.0</td>
<td>43.8</td>
</tr>
<tr>
<td></td>
<td>Regular soldiers</td>
<td>11.1</td>
<td>14.8</td>
<td>57.4</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Post-course: I am confident that I have learnt using CBL.</strong></td>
<td>Reserve soldiers</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Regular soldiers</td>
<td>6.7</td>
<td>20.0</td>
<td>26.7</td>
<td>46.7</td>
</tr>
</tbody>
</table>

Figure 7.8 Trainees’ perceptions of confidence in learning using e-learning: Regular soldiers, pre-course (n=54) and post-course (n=48) and Reserve soldiers, pre-course questionnaires (n=16)
* There was no post-course questionnaire for the Reserve soldiers. Interview data provided feedback on this issue.

Before the e-learning course, the Reservists were less confident than the Regular soldiers that they would learn with the e-learning course (Figure 7.8). Some Reservists described unsatisfactory experiences with university e-learning and concerns about the usefulness of e-learning for Army training. In the interviews towards the end of the three-month e-learning period, Reservists expressed considerable concern about remembering the e-learning content for the summative assessments. Regular soldiers were less confident that they would learn using the e-learning course than they were about their learning after completing the course (Figure 7.8).

The pre-course questionnaires indicated that the respondents predominantly ranked the effectiveness of e-learning and face-to-face instruction as about the same or were uncertain in terms of relative effectiveness (Figure 7.9).

<table>
<thead>
<tr>
<th>Pre-course questionnaire statement</th>
<th>Reserve soldier respondents</th>
<th>Regular soldier respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBL more effective</td>
<td>6.3</td>
<td>7.4</td>
</tr>
<tr>
<td>Both are the same</td>
<td>18.8</td>
<td>37.0</td>
</tr>
<tr>
<td>Face-to-face instruction is more effective</td>
<td>25.0</td>
<td>33.3</td>
</tr>
<tr>
<td>Uncertain</td>
<td>49.9</td>
<td>22.3</td>
</tr>
</tbody>
</table>

Figure 7.9 Trainees’ ranking of perceived effectiveness of course delivery modes: Pre-course questionnaire results (Regular soldiers n=54, Reserve soldiers n=16)
For the Regular soldier respondents there was more certainty about course delivery preferences after experiencing the e-learning course, with about seventy percent indicating that e-learning was less effective than face-to-face instruction, and a greater percent (20.9%) than pre-course (7.4%) indicating that e-learning was more effective (Figure 7.10).

<table>
<thead>
<tr>
<th>Regular soldiers Post-course questionnaire statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think that CBL is a more effective way to learn than face-to-face instruction.</td>
<td>29.2</td>
<td>41.7</td>
<td>8.2</td>
<td>18.8</td>
<td>2.1</td>
</tr>
<tr>
<td>I think that CBL is a more efficient way to learn than face-to-face instruction.</td>
<td>18.8</td>
<td>33.3</td>
<td>6.2</td>
<td>37.5</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Figure 7.10: Trainees’ ranking of perceptions of course delivery modes: Regular soldiers, post-course questionnaire results (n=48)

There was also a diversity of opinions about the efficiency of e-learning (Figure 7.10). There was a more even split indicated for efficiency than effectiveness, with fifty-two percent of the Regular soldier respondents who indicated that e-learning was more efficient than face-to-face instruction. Respondents indicated an overall preference for using face-to-face training as a more efficient way to learn practical skills. The efficiency aspect was included in the post-course questionnaire as managers made claims that e-learning was more efficient than face-to-face classes in terms of covering the amount of content. However, there were negative trainee comments based on inflexibility in using the e-learning modules to reflect previous knowledge, such as ‘repetitive content’ or ‘too much unimportant information’ (Regular soldier questionnaire).

There was also a range of support for the usefulness of e-learning within the Reservist group. Most of the Reservist respondents indicated at the end of the course that the flexibility of self-managed learning was an advantage to manage many competing priorities. Primarily, Reservists were concerned about the time gap between doing the e-learning modules and gaining practical experience. There was a preference to include more face-to-face instruction during the e-learning period to reinforce and confirm practical skill training. Trainees could see the advantages of using a mixture of course delivery methods: ‘They both have good and bad points. There are some things best learnt one way and some the other’ (Regular soldier questionnaire). Face-to-face delivery provided a more focussed learning environment with the discipline of an instructor and opportunities for questions and feedback and e-learning courses provided a more flexible learning environment in terms of self-paced learning:
At first, I had doubts. At first I thought the face-to-face was better - you can talk with people...Instructors who have served, particularly overseas, can talk about their experiences. However, with computer-based learning you can revise. Face-to-face - once the lesson is done, it’s finished. (Reserve soldier interview)

Therefore, trainees to some extent supported training managements’ expectations that e-learning classes would effectively replace some face-to-face learning in classrooms. However, practical training and face-to-face contact were valued as an important part of the learning process by trainees.

Providing correct content and procedures influenced perceptions of the value of doing e-learning courses. The Regular soldier respondents indicated that there were issues with incorrect content and differences between the course and training experiences (Figure 7.11).

<table>
<thead>
<tr>
<th>Regular soldiers Post-course questionnaire statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The content was accurate and correct.</td>
<td>2.1</td>
<td>31.3</td>
<td>12.4</td>
<td>52.1</td>
<td>2.1</td>
</tr>
<tr>
<td>The CBL content reflected my previous Army experience.</td>
<td>6.3</td>
<td>56.3</td>
<td>6.1</td>
<td>29.2</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Figure 7.11 Rating of course content currency and relevance to experience: Regular soldiers, post-course questionnaire (n=48)

The Reservists also raised issues about content particularly on issues that related to discrepancies between experiences of practical training in the Reservist training units and the presentation of procedures in the e-learning course: ‘Reality is a bit of difference - what is being taught and what they are expected to learn in the units. There is a gap’ (Reserve soldier interview). These discrepancies created tensions for trainees, as they were required to meet the requirements of both the course and the officers in the units. Ensuring the currency and accuracy of the content was also important to encourage confidence in the reliability and relevance of e-learning courses. Trainees suggested that Web-based course design and delivery could provide opportunities for faster content updates than CD-ROM courses.

7.2.2.2 Self-paced learning contentions

There were expectations from management and instructional designers that e-learning courses would provide flexibility for trainees to access content to suit individual learning
needs. However, trainees experienced restrictions in the time available to complete the modules. For the Regular soldiers, progress was enforced by the classroom delivery and for the Reservists, family, work and other study commitments restricted the time available to do the course. Therefore, the potential for flexible self-paced or independent learning from using e-learning courses was modified by other factors in the learning environment.

The structured classroom delivery periods provided the Regular soldiers with a defined period of study for the e-learning modules, which gave the majority of them sufficient time to complete the modules (Figure 7.12). The Regular soldier, post-course questionnaire indicated that while most respondents (79.2%) found that they could comfortably complete the modules in the time provided, there were about twenty percent who had difficulties Figure 7.12. They were not confident that they could complete modules or they were not confident that they had learnt during the class periods.

<table>
<thead>
<tr>
<th>Regular soldiers</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I felt I could comfortably complete the modules in the class time provided.</td>
<td>2.1</td>
<td>16.7</td>
<td>2.0</td>
<td>66.7</td>
<td>12.5</td>
</tr>
<tr>
<td>I felt confident that I could learn in the class time provided.</td>
<td>2.1</td>
<td>20.8</td>
<td>4.1</td>
<td>66.7</td>
<td>6.3</td>
</tr>
<tr>
<td>I felt that I had control over the pace of my learning.</td>
<td>8.3</td>
<td>18.8</td>
<td>0</td>
<td>66.7</td>
<td>6.3</td>
</tr>
<tr>
<td>I felt that I had time to repeat the CBL modules to learn, if necessary.</td>
<td>12.5</td>
<td>27.1</td>
<td>4.1</td>
<td>50.0</td>
<td>6.3</td>
</tr>
<tr>
<td>I found it useful to come back after class to revise the CBL modules.</td>
<td>6.3</td>
<td>37.5</td>
<td>8.2</td>
<td>41.7</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Figure 7.12 Trainees’ support of e-learning course self-paced learning factors: Regular soldiers, post-course questionnaire (n=48)

The diversity in perspectives about the self-paced aspects of e-learning courses indicated individual differences in abilities and preferences for independent learning: ‘I can go at my own pace-can go back over things. I am in control’; ‘…this course is not self-paced, so you rush through most information to stay with the group’ (Trainee interviews). There was also concern that completing the modules did not necessarily equate with learning the content: ‘The computer program allows you to continue, even if you don’t fully understand’ (Regular soldier, post-course questionnaire).

Therefore, with the opportunity for more independent learning there was an associated expectation of more control over the learning process. However, the programming of the course provided for a structured, linear approach to completing the modules, which
provided limited flexible access to the content to self-manage learning needs. Reservists in particular requested more flexibility to be able to stop and start the modules when study was interrupted. Although a bookmark facility was available on the modules, trainees found that this feature did not always work or it did not allow trainees to progress to the next section. Trainees were also frustrated with a feature of the modules that required every aspect of every learning activity to be completed before the next section or assessment tasks could be accessed. Often these features were not obvious (e.g. rollovers) and trainees accidentally missed some aspects that involved repeating sections of the module. While these technical features led to trainees completing the entire course, there were no allowances for flexibility in accommodating previous knowledge.

There were also differentiations made between having control of the pace of learning and having control over selecting the content needed for learning. This last aspect was included in the Regular soldier, post-course questionnaire as it reflected issues emerging from the Reservists’ interviews. That is, some trainees already had the skills and knowledge required and found the module content repetitive. Alternatively, trainees without experience were going through the e-learning modules and trying to remember every aspect of the content for the assessment. The Reservists commented that in a face-to-face class the instructor would highlight the important sections to focus on for assessment. Providing some indication of the relative importance of various aspects of the e-learning content and some flexibility over selecting the content to be studied in depth was suggested as a possible improvement.

The Reservists varied in their management of self-directed learning depending on their past educational experiences and other competing demands on their time. At the beginning of the e-learning course the respondents valued being able to do self-paced learning and being able to repeat and revise the content in the e-learning modules. However, it became evident that time management became more of an issue for Reservists and revision was not undertaken before the summative assessment period. Long working days, young children and spouses who work shifts made time management difficult for Reservists. Reservists who were university students found that they could manage their e-learning study time well by allocating specific periods to do the course. However, the field-based training session clashed with the end of year exam period and they had to withdraw from the course.
Further indications of the difficulties that Reservists were having with time management came from the Army’s end-of-course check of the automatic recording of module completions for the course. These recordings indicated that only one of the sixteen Reservist trainees had completed all of the e-learning modules. At the end of the course, only ten trainees had completed the pilot e-learning course and attended the field training and summative assessment session. Three trainees failed to complete more than thirty percent of the e-learning modules and only one trainee completed all of the e-learning modules (Training manager interview).

Understanding the commitments and lifestyles of Reservists and providing some flexibility to manage training and assessment periods were suggested as remedies. Alternatively, there were suggestions from the Reservists to move back to a two week residential, using either e-learning or face-to-face instruction. This suggestion came within the context of difficulties in managing other commitments in their life over three months compared with the relative ease of organising a block of time away from these other commitments. Distance learning provided flexible learning options to cater for trainees’ range of lifestyles and time available for study. However, the trainees’ experience with distance learning influenced their ability to manage the e-learning course effectively. Providing a structured learning environment in the residential period supported the Regular trainees in completing the e-learning modules efficiently and assisted their learning needs. The trainees were balancing the self-paced aspects associated with e-learning with the discipline provided in the structured classroom environment.

7.2.2.3 Valuing instructor and peer interactions

The provision of some instructor support and peer interaction were important to provide structure and feedback for e-learning module completion. Trainees valued asking instructors and peers questions to provide clarification of content and learning in face-to-face classrooms and in e-learning situations. This opportunity for interaction was still available in the classroom for the Regular soldiers but greatly reduced for the distance-learning trainees. The Reservists also valued instructor and peer contact in face-to-face classroom situations, and were disappointed with instructor contact during the e-learning course: ‘Other trainees were put in a room with the computers and they can talk and ask questions. We need to have someone to clarify questions’ (Reserve soldier interview).
The Regular soldier respondents were generally satisfied with the learning support they received in the classroom (Figure 7.13). They also felt confident that they could ask the instructor, and other trainees, questions in the e-learning sessions.

<table>
<thead>
<tr>
<th>Regular soldiers Post-course questionnaire statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I felt that I could ask the instructor questions.</td>
<td>0</td>
<td>8.3</td>
<td>0</td>
<td>75.0</td>
<td>16.7</td>
</tr>
<tr>
<td>I felt that I could ask the other students questions.</td>
<td>0</td>
<td>12.5</td>
<td>4.2</td>
<td>72.0</td>
<td>10.4</td>
</tr>
<tr>
<td>It was useful to ask the instructor questions.</td>
<td>0</td>
<td>12.5</td>
<td>4.2</td>
<td>72.9</td>
<td>10.4</td>
</tr>
<tr>
<td>It was useful to ask the other students questions.</td>
<td>0</td>
<td>2.1</td>
<td>2.1</td>
<td>87.5</td>
<td>8.3</td>
</tr>
<tr>
<td>I was satisfied with the learning support I received.</td>
<td>0</td>
<td>8.5</td>
<td>2.1</td>
<td>83.0</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Figure 7.13 Trainees perceptions of learning support: Regular soldiers, post-course questionnaire (n=48)

Asking questions to instructors was valued for gaining information and clarification. Some trainees preferred not to ask instructors questions publicly to avoid criticism: ‘Sometimes I prefer to ask the instructor more discreetly’; ‘It depends on how comfortable I am with the instructor’ (Regular soldiers, post-course questionnaire). Trainees found it more useful to ask other trainees questions rather than instructors. There was a preference to ask other trainees questions rather than the instructor due to practical reasons: ‘The person next to me might have cottoned onto what the instructor said’; ‘If a question arises that is easily answerable by a peer, it is quicker to ask them than disrupt the whole class’ (Regular soldier, post-course questionnaire). There were also emotive reasons for asking question to peers: ‘Don’t want to feel like an idiot, like not knowing basic computer skills’; ‘Mateship - if I could help someone with something, I would. That’s what mates are for’ (Regular soldiers, post-course questionnaire). Therefore, interaction was encouraged within the classroom, including student discussion. The Regular soldier respondents were transferring experiences of face-to-face classroom interaction situations to the e-learning classroom that provided effective learning support.

In comparison, the Reservists were not satisfied with the learning support they received from instructors or peers. While the Reservists indicated differences in their preferences for working alone, there was support for interacting with peers for learning (Figure 7.14).
Instructor support for distance learning reflected the hierarchical teaching relationships. As an indication of the shift in instructors’ role in distance learning to a facilitator, instructors were called Directing Supervisors (DS) by the training management. Trainees were managing their time in terms of being contacted by the DS by phone every week and having to hand in the paper-based quizzes. These quizzes were formative assessments based on the e-learning assessments that were sent by email or post to the DS each week for marking. This additional assessment was considered important by the trainees to gain feedback on their progress and as a form of discipline to complete the modules. However, there was little distinction being made between doing the assessments or ‘finding the answers’ and learning: ‘I have done three modules out of eight. I am just clicking through the module and doing the quiz at the same time (Reservist interviews).

To control the trainees’ progress, quizzes were initially sent out to the trainees each week. However, trainees requested the provision of more flexible learning options during the course and all of the quizzes were posted out together: ‘DS are pretty flexible if you don’t have your assignment done and you can give them a reason. They are not chasing up about the assessments—it’s good’ (Reservist interview). Therefore, completing the quizzes became the explicit motivation for completing the e-learning modules as the supervisors were marking them. Trainees supported this structured approach to course management from previous education and training experiences but also required some flexibility to manage study time as a distance learner.

Distance learning trainees found instructors approachable and helpful when they were contacted. Learning support for the distance learners was minimal and became more erratic during the course, which led to confusion over course requirements and reduced motivation to complete the modules. However, many of the trainees missed the instructor’s phone call and some confusion over course progress started to emerge during
the e-learning course period. The administration of the assessments started to fail in the middle of the course when the four DS left the trial due to work commitments, and trainees did not receive the marked quizzes back. Consequently, the trainees were not as motivated to do the modules, and they were falling behind the suggested schedule.

The decrease in DS contact led to mixed responses. There was a need for feedback and motivation: ‘DS have only called a few times - it hasn’t really worked out. All the DS asks is, ‘How are you going?’ All right?’; ‘I needed to chase the DS up for assignments. They let it go. Not having done them all was a problem. I need a fixed submission date’ (Reserve interviews). There were also some difficulties experienced in asking questions about content and procedures over the phone or email. Long delays in replies from the DS that extended to over a week also deterred trainees from asking questions. This situation stressed some trainees, particularly in relation to submitting quizzes, while other trainees were not concerned: ‘They have not contacted us, so I guess everything is OK’ (Reservist interview). Therefore, distance-learning trainees varied in the need for structure and management of their progress in the e-learning course depending on previous study skills and other commitments. However, providing some prompt and relevant feedback from instructors assisted in course management.

The trainees were also reflecting on the impact of e-learning courses on the cultural aspects of Army training and the importance of instructor interaction to develop and reinforce Army culture: ‘With face-to-face classes, you can observe others, observe the supervisors - look up to supervisors, ask: ‘What am I doing right?’’ (Reservist interview). Distance learning trainees were also asking superiors in their Reserve training units questions related to the e-learning course. However, this attempt to gain support for learning proved both a useful and frustrating experience. Some trainees were able to gain feedback and practical experience in their units. However, there were some discrepancies in the descriptions of practices provided by unit superiors and the course content that caused some conflict and concern for trainees: ‘Three (superiors) were asked a question and they all gave answers different to the course. The infantry in the Unit are giving different answers based on experience’. Some unit supervisors were also openly critical of the e-learning course, which also added to the trainees’ frustration: ‘I want to do it to learn, not to be confused’ (Reservist interview).
While the e-learning course was providing doctrinally correct content, trainees were influenced by the opinions and input of their supervisors. However, trainees were also aware that theory and practice often diverged, which was not reflected in the ‘black and white answers’ provided in the e-learning course (Regular soldier, post-course questionnaire). Enlisting the support of training unit supervisors to provide consistent skills and knowledge as presented in the e-learning course would have assisted trainees’ confidence and progress in the course. The value of the traditional position of instructors as role models was missing from the distance learning e-learning course experience and reduced in the face-to-face e-learning classroom.

Distance learning trainees sought out contact with peers to support learning needs, particularly to manage assessment tasks. Trainees were provided with each other’s phone numbers and email addresses by the RTC and they were encouraged by the instructors to contact each other. Some trainees had attempted to form study groups. However, as the trainees were from locations all over Australia it was difficult to establish and maintain contact.

The study groups were mostly based on geographic proximity where the trainees were in the same Reserve training unit and regularly met face-to-face. These trainees contacted each other on the phone or email for both social and learning needs that were primarily to discuss the quiz questions and answers: ‘We ring each other up before the quiz to discuss answers. If they were marked wrong we have a lot of discussion’; ‘There is a mate who lives nearby. He goes to uni too. If we have any dramas, we sit down and clarify’ (Reservist interview). Other trainees tried to establish a study group but found it difficult to find the time to meet face-to-face due to their civilian and Army commitments. Furthermore, these study groups tended to break down as trainees withdrew from the course for a variety of personal and work related issues.

Distance-learning trainees without local Reservist contacts wanted more peer support: ‘Online learning does not have enough discussion’ (Reservist interview). Because of this feedback, I gained permission from the RTC and the university to set up an online discussion forum on the university site using Blackboard™ to gain trainees’ feedback on using this tool. I was also motivated by the Reservists’ response to the pre-course survey question where most (15 out of 16 respondents) indicated that they agreed with the
statement that ‘I would like some contact with the other trainees while I am learning’ (Figure 7.14). As the Army had not planned to use discussion forums and did not have experience in using them with distance learning trainees, this experience would provide some feedback to them. The POC for the research was also a member of the forum and observed the discussion anonymously. Trainees were invited to participate in the forum by email and about half of the trainees indicated that they would like to participate in the forum.

About half of the Reservist respondents indicated in the pre-course questionnaire (Figure 7.7) at least average competence using discussion forums (49.9%) and chat sessions (56.2%). Therefore, it was anticipated that trainees would need some encouragement and assistance to use the forum. In Week 3 into the distance learning course, I sent an email to the trainees indicating that I had set up a discussion forum and invited them to participate and provided them with a login and password. I provided instructions to use the forum and encouraged them ‘to have a go’. I had also emailed the trainees asking for feedback on the course and they indicated that time management was the main issue. Initially I provided a discussion area and links to resources for distance learning trainees, such as time management and study skills. I also set up a discussion area for a ‘Coffee Shop’ where they could introduce themselves and raise any issues. Five trainees became active contributors to the forum providing background information and sharing some of their problems and study strategies.

Towards the end of the course, I asked by email for feedback from the trainees on the potential usefulness of using discussion forums in the e-learning course. I also asked for feedback in the last round of interviews. Lack of time was provided as the most common reason for not using the forum. Trainees who had used the forum thought that this tool could be useful if it was focussed on discussing the course content and specific areas related to the course. Therefore, there was some support for the use of online forums to support distance learning if it was directly relevant to completing course assessment.

The Army’s competitive team-based culture was reflected in the interest in using online discussions. The group of Reservists would be required to work as a team in the practical summative assessment session where they would be competing against other trainee sections. Therefore, getting to know the other trainees and their capabilities was important.
in planning for the teamwork: ‘Communication within Section is important - comradery, blokey stuff. It is competitive - the Army way of doing things’ (Reservist interview). Therefore, there was support for using online forums or chat to communicate with other trainees for tactical reasons:

    The Section needs a plan of attack for residential - how they are going to help each other to get through. I have a few ‘tricks of the trade that I need to pass onto the Section. It is essential that they get through the practical...It is important to gauge other people's weakness, where they are struggling (Reservist interview).

The differences between face-to-face instruction and e-learning sessions in terms of developing the comradery of the traditional training culture were also a disadvantage of distance learning:

    This is different to face-to-face where I would get to know them. It would be good to get to know them by the end of the year. It would be good to get to know how they think. How they go about doing things. How they work together. They should be getting together. The Army hasn't encouraged this’ (Reservist interview).

Reflecting the Army training culture, distance learning trainees indicated that they missed the discipline and structure required in face-to-face classroom situations: ‘You need discipline for the job. For face-to-face classes you have to be on time. With computer-based learning - you can do this at 1 a.m.’; ‘This involves Army things - have to look and feel sharp, not asleep’; ‘With face-to-face learning you have to be on the ball’; ‘Army courses keep you on your toes, lot of regurgitation’ (Reservist interview). Therefore, trainees valued experiencing the authoritarian training culture as a part of becoming a soldier. However, a part of this culture also included developing a community of learners and peer support structures for training and working. While the e-learning courses provided an authoritarian perspective and structure, it reduced the trainees’ abilities to develop the support structures required for teamwork-based skills.

7.2.2.4 Understanding learning outcomes

Inadequate time to practice skills covered in the e-learning modules during the class time residential period or during the distance learning period was reducing confidence about learning retention for the summative assessment period. Suggestions for improvement centred on providing short practical training sessions integrated with the relevant e-learning module content.
The Reservists expressed more concern about learning retention than the Regular soldiers due to the delay of up to three months between completing the e-learning modules and gaining practical experience. The Regular soldiers also indicated that they required more opportunities to practice skills during the residential period: ‘Some aspects of this course suit CBL. However, others strongly require a face to face learning experience’ (Regular soldier trainee post-course questionnaire).

Trainees were reasonably confident that the e-learning course had provided them with theoretical knowledge and practical skills but were less confident about learning Army attitudes or reinforcing Army experiences (Figure 7.15). However, there were concerns about the replacement of face-to-face classes with e-learning modules and the need for more practical training.

<table>
<thead>
<tr>
<th>Trainees’ perceptions of learning attributes related to e-learning use: Regular soldiers, post-course questionnaire (n=48)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular soldiers Post-course questionnaire statement</td>
</tr>
<tr>
<td>I received enough opportunities to practise my skills face-to-face during this part of the course.</td>
</tr>
<tr>
<td>CBL helped me to learn theory.</td>
</tr>
<tr>
<td>CBL helped me to learn practical skills.</td>
</tr>
<tr>
<td>CBL helped me to learn Army attitudes.</td>
</tr>
<tr>
<td>I felt that the CBL content reflected my previous Army experience.</td>
</tr>
</tbody>
</table>

There were also concerns that the formative assessment in the e-learning may not prepare trainees for the field-based summative assessment: ‘Assessments are knowledge-based; not applied learning. There are not indicative of summative practical requirements’; ‘The testing suggests that they know it, which is different to achieving it’ (Reservist interviews).

Previous experience of infantry skills influenced trainees’ expectations and experiences of the course. Trainees with previous infantry experience found the course useful for reinforcing their previous learning: ‘This is really good. I can reflect on what I already know. It reinforces what I already know and I will have it down pat and revise’ (Reservist interview). There was acknowledgment that the course provided a basis for the practical: ‘It does lay down the foundation. It would help those who do not have the experience of
what to do’ (Reservist interview). Infantry trainees were also approaching the course content from a different perspective to the less experienced trainees. Infantry-based trainees described learning benefits related to learning management skills that they gained from the e-learning modules: ‘It provides another perspective’; ‘I am learning the job above’; ‘I have an understanding of how to do it but at a different level’ (Reservist interviews).

Trainees with less infantry experience were less confident that the e-learning course was going to provide the practical skills required. ‘I haven’t had much experience in the field. I learn so much more by doing it out there’ (Reservist interview). There was also an expectation that practical experience would be provided in the residential component of the Reservist course before the summative assessment: ‘I am very concerned. I have had no weapons experience…I am hoping that there will be time for practice at residential’ (Reservist interview). There was also an expectation that distance learners would be given some practical training in their Reserve units or at the field-based training session before the assessments: ‘They should make practice in the unit compulsory. This is hands on stuff’ (Reservist interview).

The Regular soldiers were given the opportunity to practice skills in the field prior to summative assessments that was not made available to the same extent to Reservist trainees. The Reserve soldiers indicated that gaining some practical learning experience in their units during the e-learning period improved their confidence that they were learning. However, some trainees found that Reserve unit supervisors were difficult to approach or there was insufficient time available for practise related to the course. Therefore, while there was some confidence about the usefulness of the e-learning course for learning theory and background practical skills there was a need to practice skills to confirm and reinforce learning.

Introducing practical sessions close to the e-learning module to reinforce and confirm learning were proposed as important for gaining feedback on learning and for retention. The trainees were used to this approach, being used in face-to-face classroom sessions to reinforce learning and gain feedback: ‘In face to face you get the opportunity to do mini tests-practical tests’ (Reservist interview). Reservists were also aware that Regular soldiers using e-learning had the opportunity to interact face-to-face with instructors,
which improved learning opportunities: ‘In a classroom they could brainstorm after doing
the computer-based learning...they could get feedback’. Without this feedback, the
Reservists felt uncertain about their learning: ‘With computer-based learning we are flying
blind. It makes me wonder if I am learning anything’ (Reservist interview). Although
Regular soldier trainees had more opportunities to ask instructors questions, they were
also critical of the use of e-learning for teaching practical skills and supported a more
mixed mode approach (Figure 7.16).

<table>
<thead>
<tr>
<th>Regular soldiers</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Uncertain</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think that there should be a more even distribution of CBL and face-to-face lessons in these modules.</td>
<td>2.2</td>
<td>4.3</td>
<td>4.3</td>
<td>60.9</td>
<td>28.3</td>
</tr>
</tbody>
</table>

Figure 7.16 Indication of support for more mixed mode delivery of course: Regular soldiers, post-course questionnaire (n=48)

Thus, there was demand for practical reinforcement and confirmation of learning but some
uncertainty about how this practical experience could be gained. Reservists were taking on
this responsibility themselves to gain some practical training in their Reserve training
units. However, this was difficult to organise within the hierarchical staffing structure and
their limited time available in the units. Regular soldiers were indicating this request in the
course evaluations forms and informally to the instructors but there was little evidence
over the first few years of e-learning course use of any changes being made in delivery.

There was significant evidence within the Army’s trainee post-course evaluation to
indicate that the distance learning trial did not achieve the desired learning outcomes. In
the trial summative assessment for some modules, most of the trainees failed and required
repeat lessons and assessment of the skills and knowledge. Trainees were relying on an
expectation that the e-learning material would be revisited during the residential phase but
the course failed to allow for the coordination of the two modes of learning. There was
also evidence that trainees were not provided with adequate practice time and that some of
the summative assessments included content not provided in the e-learning modules
(Training manager interview).
Course evaluation of the distance learning trial resulted in Army restructuring the distance learning phase. The e-learning course was ‘re-purposed’ (Training manager interview) with the introduction of a mid-course confirmatory residential weekend to allow trainees to practice and confirm practical skills. There was a recommendation for an instructor ‘distance learner’ workshop and the establishment of a Distance Learning Manager to supervise trainee progress (Training manager interview). These changes were also aligned with the support for more face-to-face lessons and practical experience during the classroom e-learning period to improve learning outcomes for Regular soldiers. The provision of more opportunities for practical skills training integrated with e-learning course delivery was in response to trainees’ requests. Learner’s feedback about the need for practical skills and increasingly out-of-date content were the primary reasons that instructors pushed to introduce more mixed mode delivery of the course.

7.3 Summary and recommendations

The main issues for respondents relating to the learner’s needs factor are summarised and recommendations for developing effective e-learning based on these experiences are presented.

7.3.1 Learners’ characteristics

The workplace culture assumed homogeneity in trainees’ characteristics. Furthermore, there was an explicit aim to encourage homogeneity by reducing differences in trainees’ characteristics to improve workplace consistency. E-learning was designed and delivered to meet the training priority to provide consistency in content and delivery for all trainees in training sites across Australia. However, there were also different cohorts of trainee groups with diverse backgrounds and experiences in Army training. The instructional design assumptions in providing a self-contained standardised learning package need to be considered against the problems of inflexibility in use to cater for learning needs diversity.

Recommendation:

Balancing the training priorities embedded in e-learning courses with the experiences of diversity of learners’ needs assists in providing effective training.

There were individual differences in trainees’ computer and reading literacies that were impacted on confidence and ability to participate in the e-learning courses. While there
had been some inclusion of orientation programs to improve computer skills, there was still evidence of reading and computer literacy issues influencing trainees’ completion of formative assessment tasks in the e-learning courses.

**Recommendation:**

An understanding and provision of relevant support strategies for learners’ reading and computer illiteracies needs to inform e-learning course design and delivery.

Some knowledge of preferred learning styles from previous Army experience and assumptions about trainees influenced the e-learning course design. Contentions between course design preferences for using multimedia presentations and technical restrictions that required the use of CD-ROM delivery reduced the flexibility of the course production processes to provide trainees with current content. Concerns about correct content was reducing trainee support for e-learning courses.

**Recommendation:**

Designing e-learning courses, particularly those providing core knowledge and skills, needs to be dynamic to respond to content changes and learner diversity to remain relevant to learners’ needs.

### 7.3.2 Learning strategies

Traditional training experiences were influencing trainees’ expectations of e-learning courses and the use of learning strategies to manage e-learning. Limited previous experience of e-learning created some anxiety about using e-learning courses and the usefulness of e-learning to assist in learning. Effectiveness was viewed by the trainees as the capabilities of the e-learning course to provide relevant content and perceptions of retention of the e-learning course content for the summative field assessment. Providing practical training sessions to support e-learning sessions was the preferred learning model to improve learning experiences and retention.

**Recommendation:**

Aligning expectations and experiences of different course delivery modes with summative assessment and workplace requirements encourages training experiences that are more effective.
The expectations in the e-learning course design of more self-paced and independent learning were influenced by the workplace culture. While classroom e-learning delivery provided some opportunities for interaction, distance learners found the support was insufficient. Trainees valued the traditional face-to-face interaction with peers and instructors to improve learning opportunities and as a part of the implicit culture of becoming a soldier.

**Recommendation:**
Understanding the role of interactions between peers and superiors within the workplace culture needs to be considered in designing e-learning courses to provide effective training experiences.

### 7.4 Conclusions

The concerns raised by respondents relating to learners’ needs were presented in this chapter. These issues were discussed in relation to two main influences on e-learning effectiveness - the expectations of learners’ characteristics and needs, and the learners’ strategies and experiences. A summary of the main issues and recommendations for developing effective training outcomes were presented. The concerns discussed in this chapter informed the development of recommendations for practice.

Therefore, the data analysis presented in Chapters 4 to 7 fulfil the first aim of the research, that is, to understand the factors that are influencing effective e-learning in the Australian Army. This data analysis informed the development of the model presented in Chapter 8.
Chapter 8  An integrated e-learning culture model

8.1 Introduction

This chapter addresses the second aim of the research, which was to develop a model of factors influencing e-learning effectiveness in large, dispersed workplaces. The respondents’ concerns that informed the development of each of the major factors influencing e-learning were discussed in Chapters 4 to 7. Four factor models, which are based on the analysis of the main factors, are presented in this chapter. These four factor models were combined in a substantive model, the Integrated E-learning Culture Model. The process for developing the substantive model is outlined in Figure 8.1. The factor models and a summary of each the main factors’ theoretical concepts and processes are presented in sections 8.2.1 to 8.2.4.

As the substantive model resulted from the comparative analysis of the concerns of groups of respondents in the Army, it works and fits for the factors influencing e-learning effectiveness in the Army. Glaser (1978, p. 142) describes a substantive theory or model as one that ‘fits the real world, works in predictions and explanations, is relevant to the people concerned and is readily modifiable’.

While the substantive model emerged from the experiences of the Army, it is possible to compare this model with studies of other organisations using e-learning to explore the
significance of these factors. The substantive model was compared with relevant empirical research literature to establish its place in the existing e-learning effectiveness empirical research (section 8.4). The comparison provided further understanding of the model within the Army situation and in other workplace settings. The analytical steps in section 8.4 followed the comparative analysis process outlined by Glaser (1978, p. 139):

Now the job is to compare his work with others and weave it into place in the pertinent theoretical and substantive literature. It also sensitizes the analyst to reworking his theory to the best advantage, as he studies how others are theorizing in the field. …integrative placement of ideas by supplementing, extending and transcending others’ work is the issue, not the pre-emption of his ideas.

Therefore, this chapter:

• presents four factor models based on the data analysis (8.2)
• presents a substantive model for developing an integrated e-learning culture in a large organisation, and a model of alignment resulting from the substantive model (8.3)
• discusses the main factors in the substantive model in relation to relevant case studies and other empirical research literature (8.4)
• presents a conclusion to the chapter (8.5).

8.2 Factors influencing e-learning effectiveness

The factor models indicate that different stakeholder perspectives and concerns need to be identified and aligned with each other to understand the factors influencing effective e-learning. A list of research questions based on the analysis of each factor is provided at the end of the presentation of each factor model. These questions provide researchers with a focus for identifying the process of integration of the e-learning culture into the organisational culture. A substantive model for developing an integrated e-learning culture indicating the relationships between these factor models is presented in section 8.3.

8.2.1 Organisational priorities model

The main relationships between the concepts relating to the organisational priorities factor are summarised in the model in Figure 8.2.
The main concepts relating to organisational priorities indicate the influence of the process of alignment between the e-learning policy and infrastructure provision, and the workplace culture. The workplace culture consists of the embedded assumptions, goals and processes that are transferred through the social and political structures in the organisation. The Army’s implementation of e-learning reflects the hierarchical workplace culture with the authoritarian external drivers for training changes incorporated into internal policy.

The Army used the external driver for changes in training efficiencies to scaffold investment in large-scale technological infrastructure to support e-learning projects and meet internal training goals. The resulting centralised e-learning policy drove the design, development, delivery use of e-learning courses and reflected the workplace culture and workplace structures. Support from high-level management facilitated the development (or buy-in) of specialist skills to support the large-scale e-learning projects. However, the large, dispersed organisational structure also encouraged separation of the design and delivery functions and reinforcement of existing internal hierarchies, which reduced cooperation and collaboration in e-learning processes.

A top-down hierarchy, from management to e-learning course production, delivery and use, influenced the relative level of decision-making control over e-learning activities. Formal e-learning development and evaluation systems were embedded into organisational structures that reflected organisational priorities for more efficient training while maintaining, or improving learning effectiveness. However, due to the structured hierarchical management approaches, it was difficult to set up responsive cycles of e-
learning course production and delivery to reflect changes and diversity in e-learning experiences.

Conflict about the level of autonomy and control over training delivery caused problems in how e-learning courses were being perceived and used in training centres. As tensions arose, management was resolving them through the realignment of policy within the workplace culture. A shift in the control over e-learning delivery to provide more effective e-learning, involved the alignment of the changes required within the hierarchical decision-making communication structures. This alignment process contributed to the development of a sustainable e-learning environment.

In summary, the organisational priorities factor and related concepts indicated that the process of aligning e-learning policy and infrastructure provision with the workplace culture:

- assisted in defining the role of e-learning use in the organisation
- informed development of effective e-learning priorities
- encouraged management support of e-learning
- informed development of effective infrastructure support
- reflected existing social and political hierarchies and inequalities in the organisation
- reflected the organisation’s capabilities to consider change
- encouraged the development of a sustainable e-learning environment
- encouraged the development of integrated e-learning.

The issues relating to the organisational priorities factor and the relationships between them suggested the following questions that researchers could ask to understand influences on e-learning effectiveness:

- How do policy expectations (or lack of them) and the implementation of e-learning use align with the workplace culture?
- How do e-learning infrastructure policies (or lack of them) and implementation reflect the workplace culture?
- What is the role of e-learning in training?
- What is the role of e-learning in facilitating changes required in the workplace?
• How is e-learning effectiveness defined and demonstrated by the alignment of e-learning policy and infrastructure provision with the workplace culture and training requirements?

8.2.2 Learning environment model

The main relationships between the concepts relating to the learning environment factor are summarised in Figure 8.3

![Learning Environment Model Diagram]

Figure 8.3 A model of the learning environment factor and the relationships between the main concepts and processes (shaded)

The main concepts relating to the learning environment factor indicated the influence of the coordination of the expectations of e-learning design and the experiences of e-learning delivery. Expectations of e-learning design and use were aligned with the training culture. Authoritarian organisational policy directed the use of an instructional design approach for the development and delivery of courses. The structured e-learning course design, development and delivery processes in turn supported the traditional hierarchical training culture. These workplace structures also provided the top-down support to integrate e-learning design into the learning environment. Therefore, the workplace culture was embedded explicitly in the e-learning course design features and processes.

Tensions in the learning environment arose due to differences in understanding of the role of e-learning design and delivery in training. In particular, there was concern over establishing the role of e-learning in providing relevant learning opportunities to meet practical training competencies was a concern. The intentions of instructional designers to shift the learning culture from instructor-led training delivery to more independent learning were challenged by the experiences of the conservative training culture.
Tensions also arose when the intentions in the e-learning design conflicted with the experiences of delivering e-learning. There was resistance from instructors to adjust to the changes to course delivery, particularly where these changes influenced their role in teaching and affected trainees’ learning outcomes. Trainees supported the opportunity for more self-paced learning but experienced problems with independent learning and the reduced opportunities for practical training. Further issues arose from the inflexibility of the e-learning design to be able to respond and adjust to content updates and diversity in the learning environment, which led to pressure to adopt more instructor-led, mixed modes of delivery.

In summary, the learning environment factor and related concepts indicated that the process of coordinating learning environment design and delivery:

- informed development of effective e-learning design, development and delivery functions
- assisted in developing responsive processes to manage tensions in the learning environment
- reflected existing social and political hierarchies and inequalities in the organisation
- reflected the organisation’s capabilities to consider change
- encouraged the development of effective learning opportunities
- encouraged the development of integrated e-learning.

The issues relating to the learning environment factor and the relationships between them suggested the following questions that researchers or practitioners could ask to understand influences on e-learning effectiveness:

- How do e-learning design and delivery modes reflect the requirements of the workplace culture?
- How does the learning environment technology support relevant learning opportunities?
- How do the expectations of e-learning design reflect the experiences of e-learning delivery and use?
- How do e-learning design and delivery modes align with learners’ needs?
How is e-learning effectiveness defined and demonstrated by the coordination of the expectations and experiences of course design and course delivery?

### 8.2.3 Instructors’ role model

The main relationships between the concepts relating to the instructor’s role factor are summarised in Figure 8.4. These concepts indicate the influence of the reconciliation of the instructor’s shifting role and the instructors’ need to reclaim their position in Army training.

![Figure 8.4 A model of the instructor’s role factor and the main relationships between the main concepts and processes (shaded)](image)

Instructors were reconciling the directive to implement e-learning with their past training experiences, their perceptions of learners’ needs and the impact on the instructor job status and role. The role of an e-learning facilitator was perceived as eroding the instructors’ traditional skills and potentially threatening the status of the instructor position. Relative isolation from the e-learning design and development processes reduced instructors’ previous autonomy in designing and presenting training sessions. The design of independent learning courses conflicted with the traditional instructor-led training culture. The position of instructors as role models and mentors for trainees was also challenged by e-learning course use. Perceptions of the shift in the instructor’s role were related to the increasing resistance to deliver e-learning courses.

Tensions for instructors arose due to efforts to balance personal experiences of training, and experiences of problems in e-learning use, with the organisational expectations of e-learning lesson delivery. Increasing problems with the independent use of the e-learning modules led instructors to move to reclaim their position in the training process. Feedback
to management and a change of personnel encouraged a shift to more instructor control in
e-learning course delivery. With the opportunity to reconcile the expectations of the
instructor’s role and experiences with the use of e-learning, more mixed modes of delivery
emerged. This shift in instructor autonomy generated improved understanding of the role
of e-learning modules in training.

In summary, the instructor’s role factor and related concepts indicated that the process of
reconciling the shift in role and reclaiming position:

- assisted in defining the role of instructors in the training culture
- assisted in defining effective instructors’ roles in e-learning
- assisted in developing responsive processes to manage tensions in the instructor’s
  role
- reflected existing social and political hierarchies and inequalities in the
  organisation
- reflected the organisation’s capabilities to consider change
- encouraged the development of a effective training
- encouraged the development of integrated e-learning.

The issues relating to the instructor’s role factor and the relationships between them
suggested the following questions that researchers or practitioners could ask to understand
influences on e-learning effectiveness:

- How does the instructor’s role in e-learning reflect the training culture?
- How does e-learning delivery influence the traditional instructor’s role?
- How does the instructor’s role reflect the learning needs of students?
- How are shifts in the instructor’s role being reconciled to encourage effective
  training?
- How is learning effectiveness defined and demonstrated by shifts in the
  instructor’s role and reconciliation of the instructor’s role in training?

8.2.4 Learners’ needs model

The main relationships between the concepts relating to the learners’ needs factor are
summarised in Figure 8.5.
The main concepts relating to the learners’ needs factor indicated influence of a balance between understanding learners’ characteristics and the opportunities to use relevant learning strategies. Trainees were comparing experiences of the e-learning course with their previous experiences of Army training and other educational experiences in order to develop effective learning strategies. Trainees preferred a structured e-learning environment where the learning support features of the traditional classroom environment could still be accessed.

Some e-learning design flexibility to provide self-paced learning to reflect individual, or group learning needs, was supported. Learning of practical skills was associated with the face-to-face classroom and field-based experiences, which were reduced with e-learning use. Interaction with instructors and peers was valued for providing effective learning opportunities and for maintaining embedded aspects of classroom training and the collaborative learning aspects of the workplace culture. Independent e-learning classes reduced these collaborative learning experiences.

Tensions emerged from the cultural requirement for workplace conformity compared with the experience of diversity between individuals, and between groups of trainees. Due to the authoritarian organisational culture, there were limited opportunities to respond to trainees’ experience of e-learning course use. Tensions also emerged when learners’ expectations of effective learning strategies, developed from face-to-face learning experiences, conflicted with e-learning course experiences.
In summary, the learners’ needs factor and related concepts indicated that the process of understanding learners’ characteristics and learning strategies:

- assisted in understanding the role of e-learning in training
- assisted in understanding the learners’ role in e-learning
- assisted in understanding effective learning strategies used by learners
- informed the development of effective e-learning support for learners
- assisted in developing processes to respond to changes and diversity in learners’ needs
- reflected existing social and political hierarchies and inequalities in the organisation
- reflected the organisation’s capabilities to consider change
- encouraged the development of effective training
- encouraged the development of integrated e-learning.

The issues relating to the learners’ needs factor and the relationships between them suggested the following questions that researchers or practitioners could ask to understand influences on e-learning effectiveness:

- How do perceptions of learners’ needs reflect the priorities of the training culture?
- How does e-learning design and use reflect an understanding of learners’ literacies?
- How does the design and use of e-learning courses reflect the diversity of learners’ needs?
- How is the understanding of learners’ characteristics being balanced with experiences of learning strategies to encourage effective e-learning?
- How is e-learning effectiveness defined and demonstrated by balancing learners’ characteristics and learning strategies?

Therefore, within each of the main factors influencing e-learning effectiveness there are agreements and tensions arising from the relative integration of the e-learning culture into the organisation. By understanding the nature of these tensions and the processes that were being used to relieve them, it was possible to identify the main influences on e-learning effectiveness. Even in the very hierarchical and authoritarian culture of the Army, change
was implemented gradually as problems were identified and communication channels were improved. It is proposed that researchers can examine each of these main factors and the concepts, to examine the relevance to other contexts and so identify areas of alignment and tension. This identification process will improve understanding of the issues that are influencing e-learning effectiveness.

8.3 Integrated E-learning Culture Model

By combining the four main factor models discussed in section 8.2, a substantive model for developing an integrated e-learning culture in a large organisation - an Integrated E-learning Culture Model (IECM) was developed from the Army study (Figure 8.6).

The IECM represents the interactions between the main factors and the related concepts and processes influencing e-learning effectiveness. The IECM indicates the interrelationships between the organisational priorities, the learning environment, the instructors’ role and learners’ needs factors on the development of an integrated e-learning culture. The core concern of the respondents was managing tensions by integrating e-learning into the organisational culture. There was a focus on attempting to understand how the requirement to use e-learning courses fitted with managing changes, while maintaining the status quo in the training culture. Therefore, the solutions adopted
encouraged the integration of e-learning activities into the organisational culture. While the model was based on the experiences of respondents in the Australian Army, it will be useful for other large organisations using e-learning methods in their training programs to understand the factors influencing e-learning effectiveness.

An integrated e-learning culture requires the facilitation of communication processes within and between these factors:

- the alignment of organisational expectations and experiences that develop a sustainable e-learning environment
- the co-ordination of the design and delivery of relevant learning opportunities
- the reconciliation of the instructor’s role to encourage effective learning, and
- the balance of learners’ needs and strategies to deliver effective training outcomes.

However, the organisational culture influences how technologies and learning activities are managed, designed, delivered and used. The interactions between the expectations and experiences of e-learning define the role of e-learning in training and in the organisation. The associated decision-making processes about the management, design, delivery and use of e-learning reflect the organisational culture and contribute to the e-learning culture. It is proposed from this research that the socio-cultural construction of e-learning in the organisation is the e-learning culture. That is, the assumptions, goals and processes that define the role of e-learning in the organisation make up the e-learning culture.

Therefore, the e-learning culture carries embedded features of the organisational culture and structures. The e-learning culture can also carry within it assumptions, goals and processes that are different to the organisational culture. Agreement, or alignment, about the role of e-learning contributes to e-learning integration into the organisation and encourages the development of concepts and experiences of effective e-learning. Tensions and issues about how e-learning should be integrated into the organisational culture can emerge due misalignment of the organisational culture and the e-learning culture.

Developing an integrated e-learning culture is, therefore a dynamic process over time and place that requires an understanding of changing relationships between organisational
priorities, the learning environment, the instructors’ role and learners’ needs. This understanding comes from the gaining the perspectives of the people involved in the management, production, delivery and use of e-learning.

8.3.1 E-learning culture alignment processes

The IECM includes alignment processes (alignment, reconciliation, balance, coordination) between the four main factors that assist in the development an integrated e-learning culture. The nature of these processes will reflect the perceptions of e-learning effectiveness for each of the stakeholder groups. For example, achieving relevant learning opportunities was a priority for learners’ needs and the instructor’s role factors, and is achieved by aligning these two factors using relevant communication processes. Alternatively, where the communication channels do not adequately provide for coordination or alignment between these two factors, there will be tensions in achieving relevant learning opportunities outcomes.

An alignment model (Figure 8.7) was developed to indicate the relationships between factor alignment, cultural alignment, the integration of the e-learning culture into the organisational culture and the influence on e-learning effectiveness.

![Alignment Model](image)

Figure 8.7 An alignment model indicating the influence of the alignment of e-learning effectiveness factors on e-learning culture integration and e-learning effectiveness.

For example, if stakeholders’ perspectives indicate that e-learning provides alignment with organisational priorities, supports an effective learning environment, provides for learning support needs and includes consideration of learners’ needs, there is then cultural
alignment. This alignment supports the integration of the e-learning into the organisation, and effective e-learning.

Alternatively, Figure 8.8 provides an example of the misalignment of a factor (e.g. learners’ needs) on cultural alignment, e-learning integration and effectiveness. If stakeholders’ perspectives indicate that there is alignment across all of the factors except consideration of learners’ needs then there is a cultural misalignment, which leads to tensions and ineffective e-learning.

Figure 8.8 A misalignment model indicating the influence of a misalignment of e-learning effectiveness factors creating tensions for e-learning culture integration and e-learning ineffectiveness.

Therefore, it is proposed that the alignment of factors influencing e-learning effectiveness assists in the development of an integrated e-learning culture. By understanding how embedded assumptions, goals and processes are influencing organisational priorities, the learning environment, the instructor’s role and learners’ needs, it is possible to identify areas of alignment and misalignment between these factors. Areas of alignment encourage support and areas of misalignment create tensions that influence e-learning effectiveness. That is, the factors influencing e-learning effectiveness can be further understood in terms of the areas of alignment of the e-learning culture and the organisational culture that assist in developing an integrated e-learning culture.

As the literature review in Chapter 2 highlighted, e-learning effectiveness is a complex and fuzzy concept due to the interactive and competing social and political aspects of what
is important, and to whom, when, where, how and why. The complexity of this situation is likely to be greater with e-learning than in traditional face-to-face training experiences due to the need to consider and manage new technological aspects and different influences on learning. The IECM provides a focus to identify the factors that are influencing the integration of e-learning into the organisational culture.

It is proposed that it is necessary to identify and understand how the organisational culture is reflected in the decisions made about e-learning management, design, delivery and use from the perspective of the people involved. From the understanding, it is possible to determine the social and political factors influencing the development of the e-learning culture. This knowledge improves the identification of areas of alignment and misalignment between expectations and experiences, which can then be considered and addressed to improve e-learning effectiveness.

Therefore, by taking the perspective that e-learning environments are not value-free, it is possible to understand the competing priorities and discourses that influence how e-learning effectiveness is constructed and experienced. Furthermore, by understanding that there are likely to be emerging tensions about the perspectives of e-learning integration into an organisation, particularly in a large organisation, encouraging communication processes to align diversity in assumptions, goals and processes assists in achieving e-learning effectiveness.

### 8.4 Comparison of the IECM with empirical research

The focus of section 8.4 is to compare the aspects of the IECM presented in section 8.3 with empirical research in other workplace organisations. As discussed in Chapter 2, research on e-learning use and effectiveness in workplaces is limited and independent studies are not common. To provide some insights into the main factors presented in the IECM, some empirical studies were selected that include stakeholder perspectives of e-learning in large organisations with diverse and geographically distributed workforces.

While it was not intended to provide a representative sample of workplaces, the selected studies were from a range of workplace organisations in the corporate, public and military sectors and from different countries to provide a diversity of workplace cultures and experiences. The literature search attempted to locate articles with an organisational culture aspect to compare with the IECM, but generally, this aspect was not the focus in
the literature. The selected studies included accounts of the initial adoption of e-learning and workplaces with a history of e-learning use. This selection assisted in the understanding of the usefulness of the IECM for considering effectiveness factors at different stages of e-learning use.

The researcher questions in the literature studies, the methodologies used and the presentation of results limited the comparative analysis. It was not possible (or intended) to write an intensive critical analysis of each of these papers. Instead, the factors presented in the IECM were located and some of the features that challenged or informed insights into the development of the model were considered. Therefore, this comparison provided greater understanding of the factors influencing e-learning effectiveness in workplaces and added some insights to the model. The aim was not to prove or disprove the model as correct, but to establish the place of the model in the research. That is, the constant comparative analysis method was continued with the extant literature being viewed as data for this research. Applying the IECM to the research studies also provided some experience in using the model, and led to suggestions for some procedures and approaches for research, which are further developed in Chapter 9.

The studies selected for this comparative process were from a wide range of workplace situations:

- public service sector organisations in New Zealand using a first-line management course (Winter 2006)
- public service sector correctional services departments in Australia considering the adoption of e-learning (Madsen 2003)
- four Australian corporations using e-learning or planning for e-learning use (Schofield 2002; 2003)
- examples from the US Army (Belanich, Orvis & Wisher 2003; Bonk et al. 2002a; Curda & Curda 2003; Ellsworth 1995, 2000b; Wisher, Sabol & Moses 2002) and the UK Army (Mason & Slater 2005).
An overview of the research focus and the methodology for each of these studies highlights the usefulness of the IECM for understanding the factors influencing e-learning effectiveness (section 8.4.1). A more detailed comparative analysis of the main factors in the IECM and the influences on e-learning effectiveness described in the studies provides further indications of the relevance and usefulness of the model in workplace research (sections 8.4.2 to 8.4.5).

8.4.1 Role of the IECM in empirical research studies

There was evidence in these studies of the diversity and complexity of factors influencing e-learning effectiveness. The IECM provides a focus to the identification of areas of alignment and misalignment between the main factors influencing e-learning effectiveness that were identified from the Army study.

Winter (2006) undertook exploratory research to gain stakeholder perspectives (learners, facilitators, educational designers and managers) for an effectiveness study of a first line management e-learning course used in New Zealand (NZ) public service departments. The report focuses on interviews and the focus group responses of twenty-one participants in a trial e-learning project. From a pilot study, which indicated diversity in the workplace cultures, one of Winter’s research questions focused on the influence of the workplace culture on learner outcomes. While Winter’s report refers briefly to a paper from this thesis (Newton & Ellis 2005c cited in Winter 2006), the IECM proposed in this thesis had not yet been published. The Winter (2006) report offers a good opportunity to apply the IECM to the in-depth description in a recent study of a large, diverse and dispersed public service sector workplace.

Winter (2006) provides a comprehensive description of some of the factors influencing e-learning effectiveness in the NZ public service organisations. Approaching the report using the IECM provided a practical framework to structure and to clarify the complexity of issues described by Winter. Winter’s research was useful in highlighting the importance of the learners’ needs factor and the impact of organisational culture on designing the learning environment. Although Winter (2006) described many issues and features from the workplace culture that were influencing e-learning effectiveness, these cultural influences were not highlighted in the recommendations.
Another study of a large, diverse and geographically dispersed public sector organisation is a comprehensive report exploring e-learning ‘in the culture of correctional services organisations’ in Australia (Madsen 2003). However, Madsen’s study was more limited in scope than this thesis as it investigates factors influencing the adoption of e-learning from the perspectives of supervisors, middle managers and workplace trainers. Madsen (2003) does provide a useful approach for developing action-learning processes in organisations to support and establish the role of e-learning, particularly for managers. As e-learning had not been adopted by these organisations, this study attempted an action-learning project in three locations. The respondents were encouraged to initiate discuss about e-learning by ‘identifying suitable skill areas’, ‘analysing the workplace culture for supportive resources and potential obstacles’, researching e-learning experiences in other organisations and to start developing their own e-learning projects (pp. 10-12). The problems encountered during the action-learning period reflected the alignment factors from the model, which indicated the relevance of planning for the design of effective e-learning. Applying the IECM to Madsen’s (2003) study highlighted the necessity to establish the role of e-learning within the training culture to encourage adoption. The IECM could provide a focus for action-learning approaches to assist organisations planning for effective e-learning.

Schofield’s (2002; 2003) research into e-learning across four diverse Australian companies (Ford, Qantas, Thiess, ANZ). The scope of Schofield’s stakeholder perspective was more limited than this study, as it was based on nineteen interviews with ‘key company personnel’ primarily from the human resource areas (Schofield 2003, p. 164). A result of this approach is a focus primarily on business drivers for e-learning implementation. The research focused on organisational influences to understand the ‘the thinking that lies behind a company’s decision to adopt or not to adopt e-learning solutions’ and ‘how the corporate context affects the choice of approach to e-learning (Schofield 2002, e.p). Schofield identified a need to consider the influence of the organisational culture on e-learning use.

Schofield’s (2002) research indicated the need to define the role of e-learning in training and the impact of organisational priorities as drivers for using e-learning, and confirms the importance of the alignment of e-learning adoption with corporate strategies. It is evident within these company profiles that there was a wide range of socio-cultural factors
influencing the adoption and use of e-learning. However, Schofield (2003) did not explore the socio-cultural issues, except in the potential of e-learning to ‘re-position’ training in the organisations. Using the IECM would have highlighted areas relating to learner needs and the learning environment influencing e-learning effectiveness in these contexts.

The results of a study of e-learning success factors for twenty-nine large UK organisations (e.g. BBC, the Ministry of Defence) and multinationals (e.g. Xerox, Coca-Cola, Volvo Trucks) are presented in a report (Ettinger & Holton 2004) and a subsequent series of four papers (Ettinger 2005; Ettinger, Holton & Blass 2005; 2006a; 2006b). The organisations were using e-learning courses produced by the authors at Ashridge, a UK business school. While not based on independent research, the report indicates that attempts were made to achieve independence, including gaining the approval of the case study reports from the survey organisations (Ettinger & Holton 2004).

The Ettinger and Holton (2004) report is valuable as it contains comprehensive accounts of corporate case studies of large organisations across a wide range of sectors and it is freely available, which is unusual for corporate research studies. While interviews were undertaken at sixteen organisations, the number of respondents was limited, with generally only one or two people being interviewed from each organisation and predominantly from the human resources areas. Therefore, the study reflected the perspective of middle managers with some experience in the management or design of e-learning.

The key findings presented by Ettinger and Holton (2004, pp. 2-3) indicate a wide range of factors influencing the success of e-learning. The report presents these factors as four stages of implementing e-learning with case study examples (i.e. ‘Getting started’ through to ‘Promotion and planning’). While these factors reflected the influences of organisational culture, there was little attempt in the report to identify the influences of the diversity of organisational cultures on e-learning effectiveness. Therefore, the IECM provides a focus to improve understanding of the diversity of factors underlying the e-learning success and barrier factors identified in organisations.

An aspect of the Ettinger and Holton (2004) study was directly relevant to the organisational culture alignment aspect of the IECM. One of the main findings was that
most organisations found implementing e-learning difficult since ‘e-learning requires a cultural change to take place about how training (and learning) happens and how it is delivered’ (Ettinger & Holton 2004, p. 2). However, there was no further discussion about the nature of the changes required. The restricted nature of the research was also revealed in an additional statement about the requirement for an organisational change: ‘This may apply as well to e-learners as to line managers and trainers’ (p. 2). The IECM encourages organisations to gain a broad perspective across stakeholder groups of the impact of the organisational culture and the need for e-learning cultural alignment.

The study by Wisher, Sabol and Moses (2002) of the US Army was discussed in Chapter 2 as an example of one of the few studies that were available from the military context that provided an exploratory approach to gaining the learner’s perspective. There were examples of studies from the military context mentioned in Chapter 2 that included learners’ feedback on specific military e-learning projects (Belanich, Orvis & Wisher 2003; Bonk et al. 2002a; Curda & Curda 2003; Ellsworth 1995, 2000b), which were revisited for comparison with the IECM. As discussed in Chapter 2, these US military studies carry with them predominantly the policy requirements of the Department of Defense to develop learner-centred or ‘soldier-centric’ models of e-learning. While there were indications of some clashes between the aim of achieving learner-centred learning and the Army culture (Abell 2001, 2003; Wisher, Sabol & Moses 2002), this aspect was not addressed to any extent in these research papers.

The comparison of the selected research studies and the IECM indicates that although there are studies emerging of e-learning use in workplaces, this research tends to result in descriptions and lists of ‘success factors’ for a generic type of context. There was little focus on providing an understanding of the embedded cultural factors and processes influencing e-learning effectiveness. While the selected studies primarily used a stakeholder perspective approach, this was generally focused on one group of stakeholders, rather than gaining a broad range of perspectives. While it can be more time consuming to include a wider range of stakeholders’ perspectives, using a constant comparative research method assists in reducing the number of respondents required to gain a perspective of the main issues influencing e-learning effectiveness.
8.4.2 Relevance and usefulness of the IECM in other contexts

The aim of sections 8.4.2 to 8.4.5 was to compare the IECM presented in section 8.3 with the literature studies by asking three focus questions based on the main features of the IECM. This comparison assisted in establishing the relevance and usefulness of the model in other workplace situations. The intention was not to summarise the factors or processes presented in the selected studies. Instead, a constant comparative approach was used to confirm the relevance of each of the main factors in the model, the alignment processes and the main concept of managing tensions by integrating e-learning into the organisational culture.

The focus questions for this section were:

- Can the main factors influencing e-learning effectiveness and the interactions between them be identified in the empirical literature?
- Can alignments and misalignments between the organisational culture and the e-learning culture be identified?
- Is e-learning effectiveness being defined and demonstrated in terms of e-learning culture integration into the organisational culture?

While it is acknowledged that there could be other factors outside of these studies, particularly in other contexts, this comparative process with the substantive literature provided triangulation of the IECM outside the Australian Army study, and improved the relevance and the validity of the model. From this analysis, an approach was proposed for other organisations to use the model in understanding e-learning effectiveness factors (Chapter 9). Further research will focus on using the model in different contexts to understand the factors influencing e-learning effectiveness.

8.4.3 Organisational priorities

The main process informing the development of the organisational priorities factor in the IECM was the alignment of e-learning policy and infrastructure provision with the workplace culture (section 8.2.1). Of the four main factors, aligning the implementation of e-learning with organisational priorities was the recommendation that was most evident in the studies for achieving successful or effective e-learning. The organisational priorities varied to reflect the diversity of workplace culture idiosyncrasies, which were influencing
e-learning effectiveness. Ettinger and Holton (2004) in their study of ‘successful’ e-learning corporations identified the influence of cultural diversity: ‘There is no universal template for e-learning. Each organisation interviewed has worked hard to ensure e-learning matches their organisational culture’ (p.34). However, there was very little discussion about the diversity or influence of cultural features on e-learning effectiveness in these studies.

8.4.3.1 E-learning policy and workplace culture

The corporate sector studies indicated that for e-learning to be successful it needs to be ‘aligned’ to the ‘needs of the business’ (Ettinger & Holton 2004, p. 2) or to be ‘integrated into a high performance corporate strategy’ (Schofield 2003, p. 163).

It was recognised that although skills development is important, improving training was not in it itself often a top priority for organisations. The difficulties for corporations to value training and to undertake human resource planning and the influences on managing e-learning are discussed (Schofield 2003). Furthermore, developing corporate strategies can be problematic for large organisations in environments of constant global change and competition, which impact on understanding the role of e-learning (Ettinger & Holton, 2004).

In the commercial organisations, a broad strategic approach for effective e-learning use was preferred to sole focus on reducing costs (Ettinger, Holton & Blass 2006a; Schofield 2003). Understanding how e-learning ‘adds value to the organisation’ (Ettinger & Holton 2004, p. 10) or contributes to required improvements in ‘workplace systems and people management’ (Schofield 2003, p. 170) was found to provide an effective approach for these corporations. Therefore, there was evidence of support for the alignment of e-learning with organisation priorities for improvement and change in business and human resource workplace functions. As the corporate studies (Ettinger & Holton 2004; Schofield 2002) were of ‘successful’ e-learning use, it can be proposed that this lack of strategic planning could also reduce e-learning effectiveness.

There was also evidence from the public sector (Madsen 2003; Winter 2006) that aligning e-learning with organisational priorities was associated with more effective e-learning. However, this alignment was based more on meeting training objectives than alignment with strategic business objectives. Management support for e-learning in the public sector
cases was based on the need for improving access to training, saving costs for training, maintaining skills accreditation, supporting succession planning and improving workplace computer skills (Madsen 2003; Winter 2006).

Madsen (2003) discussed the potential conflict between the conservative nature of the corrective services workplaces and the increasing accountability due to private investment and changing social expectations and outcomes. Managers’ concerns reflected the financial costs of the establishment and maintenance of e-learning technologies and workplace culture issues. Problems with ‘professional ethics and behaviour of staff’ in using the Internet and security risks, including ‘deliberate sabotage’ (Madsen 2003, p. 43), were reported as cultural issues. Therefore, there was evidence of tensions in the management of organisational priorities and of the workplace culture that influence the design and delivery of effective e-learning.

The development of e-learning policies that reflect changes required in the organisation facilitated the integration of e-learning into the organisation. For example, Qantas College Online (QCO) (Schofield 2002, e.p): ‘and now that e-learning is embedded in our learning culture, we start to make decisions about the way we want to manage e-learning’. Therefore, there is evidence to support the concept that aligning e-learning with organisational priorities assists the integration of e-learning into the organisational culture that encourages an understanding of e-learning effectiveness.

8.4.3.2 Technological infrastructure

The IECM provides a focus to examine the influence of the aligning organisational priorities and technology policies, with the workplace culture on e-learning effectiveness. The organisations in the selected studies used various models of centralised, and decentralised, organisational structures to finance and manage technology provision and use of e-learning activities. The IECM indicates that the provision of policies and investment in technical infrastructure reflect the priorities of the organisational culture.

The Army Distance Learning Program in the US had a policy that facilitated a twelve-year plan for investment in seven hundred regional digital training facilities, two satellite video tele-training systems and the Army University Access Online (Wisher, Sabol & Moses 2002, p. 6). This highly centralised investment in technology reflects the authoritarian and
centralised management of training in the US Army. In the case studies presented by Ettinger & Holton (2004) there are examples of large companies (e.g. Volvo and Xerox) with centralised training competency frameworks and human resource management, but with regional training budgets. Schofield (2002; 2003) described the trend for the decentralisation of training functions across the organisations, where autonomy was shifted to individual business units to decide on the approaches and investment in e-learning.

While decentralisation potentially improved response to local training needs, there can be restrictions on expenditure on high cost e-learning technology support, such as providing a LMS. Schofield (2003) proposed that while linking e-learning to centralised business strategies, human resource management and training was not always easy to achieve, this alignment assists in the support for investment in e-learning throughout the organisation. Therefore, there was evidence that e-learning effectiveness is associated with centralised human resources or training priorities throughout an organisation, and centralised investment to provide appropriate and continuing access to computers and networks and IT support.

While the efficiency advantages of centralised infrastructure provision were proposed, there is also evidence of inherent regional diversity in access to e-learning technologies, which were based on workplace cultures. Madsen (2003, pp. 41-3) described technological limitations as the prime issue for e-learning adoption in the Australian corrective services study. These limitations included regional diversity in the provision of computers and networks, difficulties in getting IT support in regional areas and varying levels of security restrictions on Internet use across the sector. Ettinger and Holton (2004) also highlight the issue of diversity in technology provision across different corporation sites, including the additional issue of diversity across multi-national companies. Winter (2006, p. 28) described how the diversity of technical infrastructure and restrictions to online access within the NZ public service organisations influenced the adoption and use of e-learning. Assumptions of homogeneity in infrastructure were made by course designers, based on a pilot in one section of a department, and no pre-planning went into providing technical support in the different departments. Understanding the existing infrastructure and involving local staff at each workplace was suggested as a remedy (Winter 2006, p. 22). Therefore, there was support in the studies for the alignment
of e-learning infrastructure provision with the workplace structures and cultures to assist e-learning effectiveness.

In the Australian corrective services study (Madsen 2003, p. 27), the acknowledgement of ‘existing assets’ in the work environment that would support e-learning use, was a part of the approach to gain management support for e-learning across diverse organisations. This is an approach similar to the TECHSIM project undertaken by the Australian Army (section 2.4.2) to provide managers with an overview of the range and use of technology prior to e-learning adoption. Madsen (2003, p. 27) described workplace hierarchical staffing structures and work routines, ‘an existing culture of workplace training’ and ‘sophisticated’ information and communications systems as ‘assets’, which would support e-learning use. Thus, there was support in the studies for the identifying the features of the workplace culture and structures that would influence infrastructure provision and use.

There were also indications that IT staff may not have the specialised skills required to support e-learning (Ettinger & Holton 2004). It was recommended that arrangements need to be made with IT staff to commit them to providing support by making formal agreements and informal arrangements to ‘make them part of the function of delivery’ (Manager interview in Ettinger & Holton 2004, p. 40). Therefore, there was evidence in the studies of the usefulness of identifying the workplace structures and culture to inform the alignment of e-learning policies and infrastructure provision.

8.4.3.3 Workplace culture

Workplace cultures that encouraged both explicit and implicit support to improve the motivation for using e-learning courses were associated with e-learning effectiveness. There was the expectation in the public sector based research that a part of e-learning effectiveness would be the development of an organisational learning culture. Previous research in the NZ public sector had suggested that e-learning appeared ‘to be more successful in the public service organisations having a stronger learning culture’ (Winter 2006, p. 12), with a focus on how the workplace policies supported e-learning use.

A learning culture was indicated by respondents in the Winter (2006) study, by the provision of a time and place for e-learning use and accreditation for e-learning course completions. Where the e-learning course contributes to the succession planning policy,
there was more ‘official and managerial support within the organisation’ (Winter 2006, p. 25). Providing accreditation for e-learning also resulted in lower student drop out rates than in organisations that had not undertaken this alignment process (p. 27). Informal feedback on learners’ subsequent workplace performance also assisted in further developing learner and supervisor support for e-learning (p. 26). Where the priorities for e-learning use were supported by workplace training policies and practices, e-learning effectiveness was encouraged in terms of course participation and completions.

There are examples of a transformational focus to promote a change in the organisational culture through the implementation of e-learning. Mason and Slater (2005) discussed the use of e-learning in the UK Army for elective military e-learning courses, as a part of the aim to develop a ‘learning organisation’ (p. 1). Similar to the Australian Army experience, reduced staffing and continually changing operational conditions had created a need for flexibility in training approaches. The e-learning success factors were based on the support of organisational factors including leadership, technical infrastructure, facilitator interaction and the use of a selection process for course participation. In particular, establishing the relevance of e-learning courses to the training culture was reported as a success factor: ‘the integrating of the courses into the training and other activities of the soldiers’ (p. 3). Furthermore, the soldiers’ experience of the organisational support for e-learning assisted in the development of lifelong learning strategies that also ‘reinforce the learning culture’ (p. 3). Therefore, there was evidence of the alignment between organisational priorities, the learning environment, workplace culture and learners’ needs supporting e-learning effectiveness in terms of encouraging organisational transformation.

There was also a transformational focus in the correctional services sector study, which had an aim to move ‘the workplace to a learning environment’ (Madsen 2003, p. 7). Madsen (2003) adopted a transformational approach to the focus groups by introducing the concept of the development of a learning culture. Managers responded favourably to the concept of promoting ‘organisational development through a technology driven emphasis on a culture of learning’ (p. 7). However, Madsen found that planning for e-learning as a driver for change in the conservative hierarchical training culture had encountered many ‘technical, environmental and cultural barriers’ (p. 16). In particular, she described the ‘adversarial nature’ (p. 16) of relations between the different levels and sections of the organisation, which reduced cooperation and trust and influenced e-
learning implementation. Therefore, it was evident that tensions from the inherent conservative workplace culture were influencing the use of e-learning to encourage organisational change.

The aim to shift to more learner-centred learning approaches using e-learning in the US Army (Abell 2001, 2003) also indicated an expectation of transformational change in the training culture. The US Army implemented centralised e-learning policies in 1996 through the Army Distance Learning Program. These policies provided funding priorities and objectives to support the constantly changing training needs of the dispersed troops (Wisher, Sabol & Moses 2002). These goals were achieved in terms of reports of savings in travel costs, reducing disruption to soldier’s family and work lives (Wisher, Sabol & Moses 2002) and the use of collaborative e-learning approaches in some higher level training courses (Bonk et al. 2002a; Bonk & Wisher 2000). There were issues raised briefly about learner resistance and the lack of cooperation within and between Defense departments, resulting in technological conflicts and the recognition of the need to understand effective instructional design strategies for effective distance learning (Wisher, Sabol & Moses 2002, pp. 19-20).

Aligning e-learning implementation and use in large, dispersed and hierarchically structured organisations can be difficult if e-learning is associated with the need for major workplace cultural change. When e-learning is being used as a driver for organisational change, the IECM would be useful to highlight areas of alignment and misalignment of proposed e-learning use with the workplace culture.

Furthermore, examination of the transformational aspects in the studies (e.g. Abell 2001; Ettinger & Holton 2004; 2005, p. 286; Madsen 2003) raised the issue of whether an organisational cultural change is required for effective e-learning use. The main difficulty of e-learning implementation was proposed by Ettinger, Holton & Blass (2005, p. 288) as that ‘a cultural change needs to take place in organisations to engage in the [e-learning] process’. However, there was some contention evident in this UK study as the suggested ‘success factors’ (p. 289) indicated that organisation’s priorities and learners’ needs predominate, rather than implementing change management processes. There were also recommendations for the use of pilot studies and ‘starting small’ to form a ‘solid base’ (Ettinger & Holton 2004, p. 17), rather than implementing large-scale e-learning projects.
These recommendations suggest that introducing e-learning into the organisation gradually was part of an alignment process between e-learning and the organisational culture.

Rather than requiring a major organisational change to implement e-learning, Schofield (2002) argued that it has been more effective to focus on organisational strategic goals that include more effective access to training. She quotes the Qantas College Steering Committee in 1996, which was one of the first e-learning systems in Australia: ‘First of all the training strategy was there, the e-learning strategy was an extension of the training strategy, to make the training accessible throughout the business’ (Schofield 2003, p. 171). She found that including the use of e-learning in the training strategy had also acted to ‘reposition training’ in the organisations (2003, p. 165). That is, using e-learning can also highlight new possibilities for changing the training processes, which may lead to organisational change.

Therefore, these studies suggest that it is a more effective approach to align e-learning with the priorities of the workplace culture, rather than simply promoting the use of e-learning as a change driver. Aligning the role of e-learning in the organisation with priorities to change training (or learning) processes assists in the alignment of e-learning with the organisational culture. Therefore, these studies support the IECM proposal that by including cultural change as an organisational priority, that is matched with changes in workplace practices will encourage an integrated e-learning culture and effective e-learning.

The organisational priorities factor in the IECM was confirmed as relevant for considering e-learning effectiveness in the studies. There was evidence to support the process of aligning priorities in e-learning policy and infrastructure provision, with the workplace culture. There was evidence of the role of effective communication processes in aligning e-learning policy and infrastructure with the workplace culture. However, while there were indications of success factors and barriers in the selected studies relating to the alignment processes, there was little discussion in the studies about the influences of workplace culture on e-learning effectiveness. Therefore, the IECM encourages organisations to consider the workplace culture aspects influencing e-learning policy and infrastructure provision to develop a sustainable e-learning environment.
8.4.4 Learning environment

The main process informing the development of the learning environment factor in the IECM was the coordination of expectations and experiences of the learning environment (section 8.2.2). In the empirical studies, the learning environments varied due to the diversity of expectations and experiences of e-learning design and delivery. The tensions between e-learning design and delivery priorities in corporations were indicated by Ettinger, Holton and Blass (2006b, p. 145): ‘One mistake mentioned by a few was where time had been taken to carefully plan content and approach, but planning the final delivery phase was neglected’. However, despite this observation, these authors do not discuss the reasons or impacts of this misalignment. Comparison of the IECM with the studies confirmed that the coordination of design expectations and delivery experiences was associated with e-learning effectiveness, and that there is a need to gain a better understanding of the influence of this process in workplaces.

8.4.4.1 Learning environment design

While there were recommendations for creating effective learning environments in terms of ‘creating an organisation that genuinely values learning’ (Ettinger & Holton 2004, p. 30), there was little focus on the development of effective learning opportunities within the training culture. There was agreement that e-learning content needs to be current and relevant to organisational needs. The delay between course development and delivery created problems with currency for some organisations, with the need for good communications highlighted: ‘tying the two stages of training-design and delivery’ through regular meetings was important for delivering relevant e-learning (Ettinger & Holton 2004, p. 56). Therefore, there was support in the studies for coordinating design and delivery functions through effective workplace practices.

Priorities for the planning and implementation of the design and delivery of e-learning reflected the workplace cultures. While the Australian Army develops their own content to provide the specialised skills, attitudes and knowledge competencies required in training, the use of externally designed and developed e-learning courseware was common in the selected studies. Using externally produced courses influenced the expectations and experiences of e-learning, depending on the relationship with the supplier. In the UK corporate sector studies (Ettinger & Holton 2004), the predominant course supply
approach was to buy ‘off-the-shelf’ products or to contract externally produced content to use with or without some locally developed content. The reasons organisations use external suppliers included: the lack of internal expertise; the cost, time and effort required in developing courses; the advantage of gaining access to external subject expertise and knowledge, and the need to pilot e-learning quickly to gain management support (Ettinger, Holton & Blass 2005; Schofield 2002).

Ettinger and Holton’s (2004, p. 70) summary of the key qualities of e-learning suppliers were ‘ability and professionalism’ and ‘a company who will understand the business culture’. These key qualities indicate cultural alignment areas, for example: the need to ‘tailor’ e-learning material, the provision of ‘company specific material’, ‘understanding business culture fit’, providing ‘local language material’, the need to ‘understand our company’ and forming ‘genuine partnerships’ with companies (Ettinger & Holton 2004, pp. 70-2). However, these authors did not directly relate these key qualities to aligning e-learning design with the workplace culture. Using the IECM highlights the need for communication processes to coordinate the e-learning development processes and the workplace culture to develop effective e-learning opportunities.

As many of the companies in the Ettinger and Holton (2004) case studies are multi-national, there was a need to adapt courses to include local languages and local content. The need to provide standardised competencies and knowledge across the organisation had to be balanced with the need to address local learning needs. This issue was reported by as being unresolved in the UK study. The influence of local workplace and country cultures on e-learning effectiveness in multi-national companies was an issue that was raised, but was not discussed to any extent in some of the studies. Therefore, aligning both e-learning design and development processes with the diversity of workplace cultures was associated with e-learning effectiveness. However, there was evidence of a need for further understanding of this issue.

There was also evidence misalignment between the external course supplier’s organisational culture and the users’ workplace culture, including the supply of irrelevant content, the use of inappropriate learning approaches and unexpectedly high costs of course development. For example, Thiess is an engineering firm involved in the Australian mining industry, which employed a university supplier to develop training
using WebCT based on Web based delivery (Schofield 2002, e.p). However, considerable problems resulted that indicate cultural clashes between the two organisations, in particular ‘thinking and acting as one was harder than expected’. Other course development problems resulted from allowing the technology to drive the development and ‘over-engineering’ the product, which reduced course flexibility and increased costs unnecessarily. The resulting e-learning packages did not meet the organisational needs and the company reconsidered e-learning options in terms of ‘what are we really doing this for’ (Schofield 2002). By re-examining how the staff worked, communicated and learnt from each other, Thiess managers decided that using collaborative online tools and simulations, and encouraging the incorporation of e-learning with e-business would be a better fit with the organisational culture. That is, there was evidence to support the core concern of respondents from the Army study, which was managing tensions by integrating e-learning into the organisational culture.

There was a wide range of knowledge and skills being delivered using e-learning in the studies. These courses included theory for apprenticeship training at FORDSTAR (Schofield 2002), simulations of banking procedures at ANZ eTrain (Schofield 2002), first line management skills (Winter 2006), advanced leadership skills in the US Army (Bonk et al. 2002a) and a range of core competencies, such as computer skills, communications, coaching and management (Ettinger & Holton 2004). However, perceptions of the relevance of certain types of content and learning design approaches varied considerably across the organisations. Schofield (2003, p. 173) highlighted the need to understand different organisational perspectives: ‘There is still a view in all companies studied that some things are not amenable to e-learning but there is no common view on what these are’. There was little discussion about the relevance of e-learning for different types of knowledge and skills in these studies. Using the IECM would encourage alignment of e-learning design with experiences of effective learning opportunities in the organisation.

While aligning e-learning design with the workplace culture was confirmed as relevant, there was little evidence in the studies of explicitly including the values and beliefs of the organisational culture in the design of the e-learning courseware to enculturate learners. There was some evidence of support for standardisation in the course design to include company design and presentation across different countries, for example, Xerox (Ettinger & Holton 2004). This situation could have been a factor of the predominance of external
production of courses (by the same organisation in the Ettinger and Holton studies) or the particular stakeholder perspectives provided in the studies. Alternatively, explicit enculturation could be a factor influencing e-learning effectiveness that was not identified in the empirical study research.

However, there was acknowledgement in the studies of the influence of the workplace culture on training priorities. Madsen’s study (2003) included a focus on how training in the Australian corrective services sector, prior to e-learning adoption, contributed to the ‘enculturation of recruits into the workplace culture’ (p. 54). She focused on gaining the perspectives of female and Indigenous staff to understand if e-learning use could provide any advantages for these groups. The difficulties of different minority groups in challenging the authoritarian ‘majority’ view expressed through training content and approaches were raised: ‘Each cultural group sat within its own uncertainties and separations’ (p. 55).

The potential role of e-learning as ‘an alternative to this enculturation through training’ was proposed (Madsen 2003, p. 56). The minority groups surveyed in Madsen’s study expressed the expectation that e-learning could provide some cultural transformation in the authoritarian culture. ‘Online learning has the advantage of greater transparency of corporate expectations of workplace standards’ (p. 56) and has the ‘potential for designing culturally neutral resources’ and a ‘capacity to expose the learner to a wider range of values and attitudes’ (Respondents’ views in Madsen 2003, p. 57). However, within the conservative workplace culture there ‘was little confidence that discriminatory attitudes could be changed through any form of training program’ (p. 57). There were indications that the authoritarian culture was creating tensions in achieving the expected enculturation goals for e-learning. There was evidence that the organisational culture influences intentions and experiences of the e-learning design. That is, that the learning environment carried within it the expectations of the organisational culture, and in turn created further expectations of training that influence the e-learning culture.

There was also evidence in the studies of assumptions of pedagogical alignment between the e-learning design and the workplace culture. In this thesis study, the e-learning design was explicitly aligned with the Army Training System and pedagogical alignment was considered to improve learner acceptance and to transfer the training culture. In the
selected literature studies, pedagogical alignment was not described as an explicit alignment process.

However, it was possible to identify pedagogical alignment processes from these discussions. For example, the QCO case study (Schofield 2002, e.p) summarised the focus of the ‘core educational strengths’ underpinning the e-learning programs as ‘relevance, online tutor facilitation and accredited training’. The priorities for collaborative e-learning in the QCO resulted from previous effective use of collaborative training development approaches and consultation with experts in collaborative e-learning methods. This consultative culture led to industry experts working with instructional designers and the involvement of Qantas tutors with experience in face-to-face training throughout the course development and delivery processes.

In contrast, ANZ eTrain (Schofield 2002, e.p) used a business strategic approach to gain maximum ROI focusing on efficient delivery of core business and compliance courses. The learning model used was described by ANZ eTrain staff as ‘strongly and consciously influenced by the views of cognitive science and industrial psychology about learning in the real world’. The description of the priorities for the e-learning design by ANZ eTrain managers indicated a need for efficiency in providing relevant content aligned directly with workplace processes, ‘why over-engineer?’ The design and delivery of e-learning courses that resulted from these priorities were simulations of workplace systems, just-in-time independent learning, and self-directed learning with the provision of external technical support.

There was evidence of that coordination between e-learning design and delivery processes that assisted e-learning effectiveness in these organisations. There was also evidence of implicit enculturation of preferred learning models in the design and delivery of e-learning based on the workplace cultures. However, the authors did not highlight the alignment of pedagogy and workplace cultures as an influence on e-learning effectiveness. The use of the IECM could encourage the identification and evaluation of the cultural influences on the assumptions embedded in the e-learning instructional design.

There was evidence that tensions emerged when there was misalignment between the pedagogical design of the courseware and the expectations of the training culture. For
example, one of the explicit aims in designing the e-learning course for the NZ public sector was to shift the learning approach from a ‘standards based approach’ to ‘socio-constructivist experiential learning’ that was termed ‘a key act of subversion’ by a course designer (Winter 2006, p. 17).

The Blackboard LMS in the NZ public sector provided access to discussion boards, which were central to this planned pedagogical shift. However, there was resistance to using the discussion boards from students resenting the ‘lack of relevance’ to the course (Winter 2006, p. 28) and the emotive aspect of ‘being checked up on’ (p. 18). Course designers expected that providing access to discussion boards would encourage the development of a ‘community of practice’. There was also evidence however, of territorial workplace culture factors, since learners did not initially want to work online with people from other organisations. However, the use of discussion boards was met with varied responses depending on the cultural ‘homogeneity’ and the motivation in the individual workplace cultures (pp. 18-19). Despite expectations of cultural change, the influences on participation in collaborative e-learning activities reflected the workplace culture. This thread of argument was not evident in Winter’s study.

Thus, there was evidence of misalignment between the expectations of the e-learning culture and the workplace culture influencing e-learning effectiveness. The IECM provides a focus to consider the influences of the alignment of the e-learning design and the workplace culture on e-learning effectiveness.

### 8.4.4.2 Learning environment delivery

Expectations and experiences of the technology used in the organisations influenced the design of the courses and the associated delivery modes. In the studies, there were courses being delivered by CD-ROMs, intranets, the Internet and satellite. Tensions between e-learning design and delivery, which resulted from a misalignment of access to technology, were evident in the studies. In the NZ public service (Winter 2006), scenario-based learning approaches using multimedia presentations had proven to be useful in teaching workplace managerial skills. However, the lack of available bandwidth resulted in the
development of more text-based courses than were originally planned, and which learners found more difficult to use.

There was also evidence of how the alignment of the organisational culture and the selection of e-learning technologies influenced e-learning effectiveness. Thiess (Schofield 2002) provided a good example of a company that was aware of the relevance of using different e-learning technologies and designs. Initial expectations of trials using CD-ROMs courses and Web-based learning to promote an improved learning culture were not met. Managers refocused on how different e-learning technologies could be aligned with solving existing workplace problems, for example: the usefulness of the Internet for staff to ‘find out what they need to know to solve problems or find information in real time’ and simulations of workplace tasks to reduce the risks of learning in dangerous situations (Schofield 2002, e.p). Therefore, there was evidence that the alignment of the e-learning course delivery technologies with workplace requirements assists to integrate e-learning delivery into the workplace culture.

In the studies, there had been a shift from predominantly structured instructor-led classroom training sessions to more independent learning, but there was little discussion about planning for learner support to manage these changes. Responsibility for managing the changes in the learning environment had shifted largely to the learners, with assumptions being made about their skills in time management and independent learning abilities. There are indications that changes in training delivery were not always being matched by changes in workplace practices.

The studies indicated a mixture of voluntary and compulsory e-learning course delivery approaches that aligned, to varying degrees, with the human resources or training structures. It was evident that some organisations had introduced compulsory completion of the e-learning course before undertaking other training, for example Xerox (Ettinger & Holton 2004). For Xerox, this move was influenced by a training culture misalignment: ‘the gap between words and actions, the difference between espoused company values and actual behaviour’ (Ettinger & Holton 2004, p. 68). There was evidence in the selected studies that the process of alignment of e-learning course completions with workplace policy and practices improved e-learning effectiveness in terms of learner engagement.
Thus, recognition of problems in the motivation led to changes in workplace practices, which assisted the integration of e-learning into the organisational culture.

There was evidence of problems arising where unfamiliar e-learning delivery experiences were not supported by the workplace culture, for example voluntary e-learning courses, distance delivery, self-paced learning and independent learning. There were also conflicts with e-learning use and work time and places for study. The employers’ support for providing policies, time and places to access e-learning improved the learning environment. E-learning was delivered predominantly at workplace computers with independent study time self-managed by the staff. A common problem was managing the time and place to do e-learning courses in the workplace. The self-managed aspect of e-learning was discussed primarily as a problem for these workplaces. The more self-managed course delivery that was associated with e-learning courses generally resulted in issues for staff due to work interruptions and difficulties in prioritising study time.

With scheduled learning periods, there was also evidence of a lack of coordination between course designer expectations and workplace requirements. For example, at BBC (Ettinger & Holton 2004, p. 38), a ‘hidden joker in the pack’ for designers was the conflict between their expectations of two-hour blocks being the ‘edge of time’ for staff to spend online, and the managers’ preference for eight-hour work schedules. This inflexible workplace situation contrasts with Lloyds TSB where the flexibility of e-learning was valued, as it ‘complements the pressured environment of the bank’ (Ettinger & Holton 2004, p. 49). Some companies provided specialised e-learning centres that improved the differentiation of work and study time and provided ‘a focus for staff to use e-learning’, such as Xerox (Ettinger & Holton 2004). There was also evidence of some learners from corporations using e-learning courses at home, such as QCO (Schofield 2002, e.p), which indicated a change ‘in the mindset of people in coming to training’. That is, being aware of the priorities of the workplace culture improved the coordination of e-learning course design and delivery processes.

There is a predominance of recommendations in the literature for blended or mixed mode learning approaches, particularly combining e-learning courses with face-to-face workplace tutoring or assessment. The role of e-learning in training was defined in terms of its integration within the traditional training program or as a focus for new mixed mode
training approaches. There was evidence that including the design of blended learning approaches as part of the alignment between training and organisational priorities assisted in developing effective training approaches. However, in these studies there was very little discussion of the transition from traditional training approaches or the relationships between blended learning design and delivery and the training culture.

There was evidence of the traditional training culture influencing the perceptions of the relevance of e-learning to practical and physical skills training. Madsen (2003) studied the workplace issues prior to the implementation of e-learning in the corrective services sector. The planning stage indicated potential problems in the e-learning environment related to the need for practical ‘hands on’ skills. Similar to the Australian Army study, the corrective services instructors were attempting to understand which content could be taught online and which required face-to-face training and they proposed a blended mode of delivery with e-learning ‘complementing’ practical training. The instructors’ comments reflect the need to align e-learning use with learners’ needs: ‘I like on-line learning as an additional tool. It should never replace any other form of training, the same as other forms of training should also be considered to provide the optimum method to achieve results’ (Madsen 2003, p. 40). Therefore, there was support for the concept of aligning the attitudes and beliefs about the role of e-learning with expected training outcomes to inform a gradual transition to blended learning environments.

There was a focus in the studies on improving the acceptance of e-learning by combining e-learning courses with traditional training modes. There are examples of either confident integration of e-learning as a part of the overall changes required in the training program, and some initial hesitation about introducing e-learning into established courses (Bonk et al. 2002a; Ettinger & Holton 2004). Other approaches for blended learning reflected the advantages in providing a choice of learning delivery, ‘whatever type of training suits departmental or individual learning needs’ (Ettinger & Holton 2004, p. 68). Alternatively, a structured course approach with compulsory e-learning completion built into the LMS was promoted as part of the overall training program, such as at Xerox (Ettinger & Holton 2004). Therefore, when the process of blending e-learning with other training delivery approaches reflected and supported the priorities of the workplace culture, it was associated with effectiveness.
The learning environment factor in the IECM was confirmed as relevant for considering e-
learning effectiveness in the substantive literature. There was evidence of the need for the
coordination of the design expectations and delivery experiences. There were also
indications of the influence of alignment, and misalignment, between the e-learning design
and delivery, and the workplace culture on e-learning effectiveness. However, these
relationships were not often made explicit in these studies. Therefore, the IECM
encourages consideration of the influences of the workplace culture on e-learning design
and delivery to support effective e-learning.

8.4.5 Instructor’s role

The main process informing the development of the instructor’s role factor in the IECM
was the reconciliation of the shift in role with reclaiming the position (section 8.2.3). In
the literature, there was a wide range of roles for instructors associated with e-learning
delivery, from independent learning with no support, independent learning with online or
face-to-face instructor support to instructor-led synchronous online lessons. There was
also diversity in the role of instructors as course designers, knowledge experts and training
consultants. This diversity reflected the priorities for e-learning in training and the place of
instructors in the organisation.

While there was some description of instructors’ roles in the studies and some discussion
about the impacts of the shifts in role, there was little evidence of instructors playing an
active part in reconciling these roles with experiences of e-learning. This absence reflects
the scope of the majority of these studies, which did not include the instructor’s
perspective. This omission could also reflect a lack of consideration of the impacts of the
changing role of instructors, and the impact of the shift to more independent learning on
learners.

8.4.5.1 Shifting role

The Australian Army study included a longitudinal perspective that allowed an
understanding of the changes in the instructor’s role in response to experiences of e-
learning over a few years. Madsen (2003, p. 38) found that prospective e-learning
instructors in the Australian corrective services tended ‘to see their role as the provider of
professional development, rather than innovators or reflectors on innovation to incorporate
in their training practice’. However, despite a similar authoritarian culture in the Army,
there was evidence that over time that Army instructors did initiate changes in e-learning delivery based on their experiences and reflection. Including instructor’s perspectives allowed consideration of influences of alignment and misalignment between expectations and experiences of course development and use. Where no instructors are involved in e-learning delivery, perspectives could be gained from the workplace trainers or learners of their expectations or experiences of independent learning.

Despite limited reporting of instructors’ perspectives in the studies, the need to understand the role of instructors in e-learning and their overall role in training programs was evident in the literature. In most of the studies, instructors were current staff members with specialised subject knowledge or middle level managers responsible for training, with some use made of external training providers. Taking on the role of e-learning facilitator included varying types and levels of support that reflecting the training culture.

There was evidence of the influence of the organisational culture on how the instructor’s role was defined, however this influence was not often expressed in these studies. There were parallels between the authoritarian culture of the corrective services report (Madsen 2003) and the Australian Army study. Madsen’s action- learning approach to understanding e-learning issues prior to implementation indicated that the instructors valued being ‘expert practitioners’ and were ‘resourceful’ in planning for e-learning (p. 38). However, despite this interest and involvement, the instructors expressed less confidence ‘about what would change in their roles if online learning was to be introduced’ (Madsen 2003, p. 38). Reflecting the hierarchical workplace culture, they expressed concerns about the workload implications and the need to define the new roles and responsibilities. Therefore, there were expectations that the hierarchical workplace culture would influence the instructor’s role and there were concerns about the impact on their position in the organisation.

Recognising and defining shifts in the instructor’s role were related to organisational priorities and the training cultures. The shift in role was recognised in most of the studies, but the impacts of the traditional training culture were not discussed to any extent. Abell’s (2001; 2003) research supported the development of constructivist learning principles in the US Army, and acknowledged that some change may be involved with the warning: ‘Army instructors, like their students, will likewise feel uncomfortable adopting new
training strategies, and will need guidance in how to develop new skills’. However, there was little discussion about developing these new strategies. Experiences with a Netherlands Army e-learning course (Jansen et al. 2002) found that although constructivist methods were embedded in the design, the instructor-led organisational culture dominated. This conflict resulted in instructors controlling the online discussion using similar authoritarian approaches as to their face-to-face communications with students. Therefore, there was evidence of the influence of the training culture on e-learning but the association was not explicitly discussed in the studies.

There was evidence of planned shifts in the role of instructors with e-learning use, which reflected broader organisational goals. For example, QCO (Schofield 2002, e.p) aimed to integrate learning and human resource development including ‘repositioning’ the instructor’s role from ‘old-style training officers’ to ‘internal consultants and project managers’. While not intending to replace classroom teachers or trainers, the changing the role of instructors at QCO was viewed as ‘strategically positioning the training function’ to support ‘broader cultural change strategies’ in the business (Schofield 2002, e.p).

There was evidence of different models of e-learning support that reflected organisational priorities for training. Independent learning was a focus for e-learning development and use in most of the organisations. ANZ eTrain (Schofield 2002, e.p) was developed with efficiency and cost saving priorities and the courses were planned as independent learning to save costs. However, there are indications of some conflict in the ANZ eTrain case study, with reports that staff members who were acting as e-learning tutors ‘as necessary’ were reluctant in this role and believed that ‘online tutoring requires a different and quite specific skill set’. Alternatively, Thiess (Schofield 2002, e.p) designed independent learning CD-ROMs of core equipment training that were distributed around the organisation. Uptake was inconsistent throughout the organisation, individual interest being the main factor and a manager commenting: ‘We have never got diffusion right at all’ (Manager interview in Schofield 2002, e.p). Both planned and unplanned shifts in the instructor’s role were evident in the studies, which reflected the workplace cultures. Therefore, the IECM encourages consideration of the influence of the workplace culture in defining the instructor’s role in the provision of effective e-learning.
8.4.5.2 Reclaiming position

Recognition of the shift in role from trainer to facilitator was evident in the studies with some indications of uncertainty about this new role. Winter (2006) found that online and face-to-face facilitators were initially unsure of what support the learners required, which led to some unsatisfactory interactions. Collaborative learning experiences over the trial period, and the sharing of these experiences with other facilitators, provided understanding of effective e-learning support requirements. Winter noted that the diversity in organisational support for e-learning across the public services sector influenced whether staff and trainee experiences of e-learning acted as ‘nuclei of ongoing communities of practice’ (p. 44).

In contrast to the uncertainty and evolution of the instructor’s role in Winter’s (2006) study, FORDSTAR (Schofield 2002) provided a structured, well-defined instructor-led e-learning system. Instructors were involved in the development of the courses for a satellite communication system, providing online feedback and assessment integrated with workbooks and support from on-the-job learning activities. The instructors were provided with a five-day induction program to use the technology effectively. A manager expressed this instructor-led situation positively: ‘The presenters are now in charge of their own destiny’ (Schofield 2002). While the e-learning delivery approach was structured by the technical infrastructure, the FORDSTAR instructors were provided with the flexibility to decide how best to design and deliver the content. Instructors in both these case studies had considerable autonomy in how e-learning lessons were presented, with evidence of different types of organisational support for development of the role, which reflected the workplace cultures.

Workplace cultures that encouraged instructors to be reflective and involved in the decision-making about their role indicated that this process assisted in providing effective e-learning. While attempts at Theiss to develop collaborative learning using WebCT failed, the instructors’ involvement in this process resulted in reflections about the learning processes, the role of e-learning and the instructor’s role in supporting e-learning; ‘you just have to change the mindset’ (Schofield 2002, e.p). Because of these experiences, Thiess shifted its focus to investigating use of collaborative learning technologies that aligned with traditional workplace practices, including ‘the coaching model’. Therefore,
reflection on the shifts in the trainer role and the provision of processes to reconcile this role with the training culture, assisted in developing effective e-learning support.

There was evidence in the studies to confirm that the instructor’s role factor in the IECM was an influence on e-learning effectiveness. The predominant focus on the manager’s perspectives in the studies discouraged the discussion of the influence of the shift in instructor’s role on e-learning effectiveness. There was some evidence of the process of understanding the shift in instructor’s role but less evidence of attempts to reconcile the instructor’s role with e-learning use. There were also some indications of the impacts of alignment and misalignment between the instructor’s role and organisational culture influencing e-learning effectiveness. In particular, the focus on providing independent learning meant that the instructor’s role emerged as important after some experience with problems with e-learning. Therefore, the IECM encourages consideration of the instructor’s role, from the perspective of instructors, to understand the influences of role shifts on e-learning effectiveness.

The trend to use independent e-learning courses with no instructors raises the issue of the relevance of the name of this factor in the IECM to other workplace contexts. Where learners are required to undertake independent learning, it is evident from the literature studies that learners required support to improve motivation and the completion of courses. The factor could be renamed to ‘Learning support’ to reflect the shift in course delivery focus. The related concepts (‘Shift in role’ and ‘Reclaiming position’) are still relevant to understand the development of effective learning support that shifts and changes with e-learning use. The perspectives and experiences of other trainers in the organisation, course designers, managers and learners could inform this factor.

8.4.6 Learners’ needs

The main process informing the development of the learners’ needs factor in the IECM was to balance learner characteristics and learning strategies (section 8.2.4). Few of these studies included learner’s perspectives of experiences with e-learning, with the exception of Winter (2006) and Wisher, Sabol and Moses (2002). The managers’ or trainers’ perspectives of learners’ needs provided some understanding of organisational influences on the expectations of learners and the learning environment. Gaining the
learners’ perspective provided more focus on the learners’ preferences and attempts to manage their learning strategies.

### 8.4.6.1 Learner characteristics

Learners’ needs were reflected more in accounts of *ad hoc* experiences of implementing e-learning, rather than pre-planning based on the understanding of learners’ characteristics or developing effective learning strategies. The predominant approach described in the studies was piloting e-learning courses based on assumptions about learners’ abilities and needs, to see what would happen.

However, there was evidence that understanding the learners’ characteristics was crucial in developing effective e-learning opportunities.

Catering for diversity in learners’ characteristics was not a priority in the studies. An exception was Madsen (2003) who considered learner expectations in planning for e-learning adoption by focusing on the demographic aspects of the ‘cultural differences in learning’ of females and Indigenous trainees (p. 34). Madsen recognised that the authoritarian correctional services training culture ‘endorsed and reinforced a model of uniformity in both content and methodology’ (p. 53). The project team was interested in how assumptions about consistency and conformity in the workplace could be challenged with e-learning use to cater for learner cultural diversity.

As Madsen’s (2003) study occurred prior to e-learning implementation, the action-learning approach to trialling e-learning with staff members provided the project team with some understanding of some of the key issues for learners. This approach indicated technical and learning environment issues or ‘expectations’ that could be addressed (Madsen 2003, pp. 35-6). The list of issues indicates that learners’ expectations largely reflected the workplace culture in terms of management support for e-learning. These issues included procedures for time to study at work, priorities for content to study at work and home, provision of ‘trust’ to use the Internet, inclusion of ‘other forms of learning’, links to accreditation and providing adequate technical infrastructure to deliver the training. Gaining an understanding of learners’ expectations prior to e-learning adoption would assist in aligning the e-learning culture and the organisational culture. Therefore, there is evidence from the Madsen study that supports the IECM. The consideration of the
assumptions in the training culture and recognising the diversity of learners’ characteristics assisted in planning for effective e-learning.

The tensions between the assumptions inherent in providing independent learning and the learners’ needs for workplace support, motivation and acknowledgement are a feature of the studies. It is evident that understanding the nature of workplace practices and priorities was important to provide learner motivation to participate in independent learning. The lack of work-time available to study and the difficulties of studying from a workplace computer were the most common problems reported for learners. Some of these issues relating to the management of a time and place to study were discussed in section 8.4.2.1 in relation to organisational priorities to support learners. Where changes in workplace practices were made to support learners, such as providing scheduled study times or learning centres, learners participated more effectively in e-learning (Schofield 2003).

There was very little discussion in the studies of how independent learning practices were perceived by learners. However, there was evidence of misunderstandings of learner’s needs, particularly motivational requirements with the introduction of independent e-learning: ‘A few staff who were curious enough to experiment gave good feedback but there was certainly no flood of interest’ (Ettinger & Holton 2004, p. 36). As result of this lack of motivation, the BBC introduced new support staff positions that, over a two-year period, promoted and demonstrated ‘how the tools worked’, and more computer access was provided for staff. Thus, there was evidence that the alignment of workplace practices with an improved understanding of learners’ needs encouraged effective e-learning in terms of learning engagement.

While computer literacy was proposed in the studies as an important issue for using e-learning, it was also evident that the workplace culture influenced perceptions of computer skills. There was evidence of assumptions made by the managers about workers computer skills and attitudes to e-learning. For example, there was wariness about distance e-learning amongst the 10,000 US soldiers who participated in a survey (Wisher, Sabol & Moses 2002). Despite good access to computers and the Internet and that ‘85% of respondents expressed at least moderate confidence that they could complete an online education or training course’, there were two-thirds who ‘either felt that classroom training is more effective or were not sure that was better’ (p. 8). The concerns with e-
learning in the US Army were greater for distance learning due to the lack of social contact and the need for motivation in non-compulsory subjects. Despite these concerns, the US Army has an active and large distance-learning program.

While there was evidence, in this case, of the provision of technical assistance and access to computers, providing technical assistance for learners was not always planned for in e-learning projects. There was little focus on identifying or improving the computer literacy skills of learners. The level of technical assistance required was reported as being more than anticipated, even for computer literate staff, such as at Electrocomponents in the UK (Ettinger & Holton 2004, p. 43). Winter (2006) reported a great diversity of computer skills in the NZ public service that was attributed to the age of the learners, the computer expertise at work and the relative access to computers at work. Sharing work computers or not using computers for work influenced the ability of staff to gain physical access to e-learning courses. Computer illiteracy and the time learners needed to familiarise themselves with the e-learning course added to learners’ frustrations, particularly with work time limitations for learning. So, assumptions about learners’ computer literacy and technical support needs for e-learning were influenced by the workplace culture, but this association was not always recognised.

8.4.6.2 Learning strategies

Despite some recognition of the changes in instructor and trainee interactions learners’ perspectives and strategies to manage the changes were not provided in the studies. There were many indications of the tensions arising from the misalignment in expectations of independent, self-managed learning, including non-participation, resistance, ‘loneliness’ (Ettinger, Holton & Blass 2006a; Schofield 2002) and student withdrawals (Winter 2006). There was recognition that e-learning represented a ‘new approach to learning’ that could challenge learners’ expectations of training. Shifting to independent learning or a focus on ‘self-development may be difficult, especially if staff are accustomed to “receiving” training, rather than developing their own skills’ (Ettinger, Holton & Blass 2006a, p. 34). Ways to assist learners to manage the shift in responsibilities for managing their own learning were not addressed in these studies.

Winter (2006) described attempts to introduce discussion forums in the public sector e-learning courses to ‘achieve a more constructivist pedagogy’ (p. 11). However, there was
little evidence of these tools supporting learners except as a tool to exchange concerns about changes in workplace practices pay and conditions negotiations rather than to support the e-learning courses. There were tensions evident in the studies between assumptions of learners being able to manage independent self-directed e-learning and experiences of e-learning.

There was a focus on the need to market, sell or promote independent e-learning courses to potential users once they were implemented. Organisational communications that related to e-learning were discussed in terms of top-down ‘promoting’, ‘selling’, top-down ‘persuading’, ‘marketing’ or ‘rebranding e-learning’ to senior management and to staff (Ettinger, Holton & Blass 2006a, p. 288; 2006b); or bottom-up in terms of consulting with stakeholders, providing for learner and trainer autonomy and feedback on courses (Schofield 2002). There was evidence that providing top-down support of managers and bottom-up feedback processes for users and trainers assisted in to encourage motivation to use e-learning. However, there was little evidence of two-way communications processes at work in these organisations.

Top-down communication resulted in the expectations of the e-learning culture being aligned with the priorities of the organisational culture but it did not necessarily reflect learner needs. This was particularly the case where e-learning promotion was not aligned with training strategies or accreditation. Consequently, there was little discussion about supporting learners, despite organisations transferring responsibility for managing learning to the learners.

While many courses in the studies were offered as stand-alone independent learning, some workplaces provided online and face-to-face support approaches. There was also a range of collaboration approaches with peers or instructors to support learning. As indicated in the QCO and FORDSTAR case studies (Schofield 2002) there was diversity in the amount of trainee collaboration and learning support provided for e-learning, depending on the workplace culture. For example, QCO encouraged informal recommendations of the course to other employees to support participation in the course. A mentoring program was also set up for previous learners to mentor current learners through the course, while FORDSTAR instructors used satellite technologies to check on students’ progress through
the course. Including learner support that reflected the workplace culture was associated with providing effective training.

There was evidence that providing avenues for learner feedback about e-learning and responding to this feedback also reflected in the workplace culture. For example, FORDSTAR (Schofield 2002) provided learners with online course feedback opportunities that were possible through the use of interactive synchronous communications. From this feedback, trainers considered the format and content of courses and constantly made adjustments, where necessary. QCO (Schofield 2002) found evaluation resources limited but included regular learner feedback such as online learner surveys, Web analysis reports of usage produced through the LMS, and six monthly tutor reviews from learner feedback, and manager feedback and analysis of business benefits. The approaches used to gain feedback and how feedback was interpreted and used in further development of e-learning courses, also reflected the organisational priorities.

Accounts of responses to problems experienced by learners reflected how e-learning effectiveness was being considered in the organisations. Providing responsive actions to learner feedback was an essential part of the collaborative approach to course development in the NZ public service (Winter 2006). By actively gaining and using learner feedback on course design and experiences, the course designers focused on providing fast responsive changes to course design to meet learners’ capabilities and needs. While these public service learners related the course satisfaction to the relevance to their workplace experiences, due to the diversity of learners’ jobs, the educational designers found it difficult to cater for all possible situations of learners across the sector. However, from the learners’ feedback, the educational designers provided a range of content relevant to different departments. The course customisation improved learner satisfaction and improved the content required to gain a national training qualification. Tensions were evident between establishing learner satisfaction to improve operations and programs, and managers’ priorities: ‘To be honest, I’m not sure that senior managers really care whether learners are satisfied and all that sort of stuff. That’s a great measure for us and it’s a great measure for the learner, but selling up the line…I don’t know’ (Middle manager interview in Schofield 2002, e.p). Aligning learner needs with organisational priorities was evident in the summing up of the QCO focus: ‘You don’t get hung up about giving everyone a tee shirt when they come to a course…We put our
money into the quality of the training and the quality of the learning…making sure it’s very focussed towards meeting the business needs’. Therefore, aligning learners’ needs with organisational priorities assisted in developing effective e-learning in terms of training outcomes.

Post-course feedback also indicated unexpected areas of e-learning effectiveness. For example, gaining confidence to use computers was associated with broader learner needs of ‘becoming an adult learner’ (Winter 2006, p. 44). As many of the learners had little experience of post-school education, there were barriers associated with developing personal qualities to feel confident about learning: ‘Learners need reassurance that they are still capable of learning, and of coping with learning through the less familiar medium of the technology’ (p. 44). There was feedback indicating that before the e-learning course the participants had not seen themselves as learners. After the course, Winter reported that learners felt more ‘empowered’ with a greater confidence in themselves as learners at work.

The learners’ needs factor in the IECM was confirmed as relevant for considering e-learning effectiveness. There was evidence of the need to understand learners’ characteristics and that e-learning involved the development of new learning strategies. However, there was little evidence in these studies of gaining the learners’ perspective of these change processes. There were indications of the impacts of alignment and misalignment between understanding learner characteristics and learning strategies influencing e-learning effectiveness. However, these relationships were often discussed as post-course experiences rather than assisting learners to develop effective learning strategies. Therefore, the IECM encourages consideration of the learners’ needs from the perspective of learners to understand the experiences of managing new ways to learn for e-learning effectiveness.

8.4.7 Discussion of the IECM

The comparative analysis confirms the relevance and usefulness of the model for considering the factors influencing e-learning effectiveness in a range of workplace contexts. The comparison indicates that there was evidence of the main factors from the IECM influencing e-learning effectiveness. There was evidence that the assumptions,
goals and processes associated with e-learning were generating an e-learning culture in the organisations. However, the concept of an e-learning culture was not mentioned in these studies. Thus, the IECM provides practitioners and researchers with a focus to identify the e-learning culture in workplaces and to consider the influences of the organisational culture on e-learning management, design, delivery and use.

There was also evidence of alignment and misalignment processes between the e-learning culture and the organisational culture that were influencing e-learning effectiveness. Despite this evidence, the concepts of e-learning alignments or integration were not mentioned in the studies. The IECM provides a context to identify and to evaluate critically the areas of alignment and misalignment between the e-learning culture and the organisational culture. Although this analysis was limited by the content of the empirical studies, the comparative analysis indicates the relevance of the IECM outside the Australian Army context, and improves the validity of the model.

So, the IECM represents the main factors and concepts involved in e-learning effectiveness that transcend that Australian Army study, and the IECM can be applied to other workplaces. Further research will determine the usefulness of the model in specific workplace settings, and in other training and education contexts. While the concepts in the IECM will be contextual, the main factors and the alignment processes are predicted to be relevant to the understanding of the influences on e-learning effectiveness in other organisations.

8.5 Conclusions

An Integrated E-learning Culture Model was presented in this chapter. The analysis of the main factors influencing e-learning effectiveness that emerged from the Australian Army study informed the development of the model. Each of the factors are summarised in a substantive model representing the main concepts and processes influencing e-learning effectiveness. Further analysis highlighted the concepts and processes that were influencing the alignment of the e-learning culture and the organisational culture. These concepts and processes were represented in models of e-learning alignment and misalignment.
To provide further confirmation of the relevance of the main factors for understanding e-learning effectiveness, the IECM was compared with a range of empirical studies of e-learning use in workplaces. This literature comparative analysis process provided insights into the usefulness of the model, indicated the model is relevant outside of the Australian Army context and confirmed the validity of the model.

Therefore, the research was successful as its aims were achieved. These aims were:

- to understand the factors that are influencing effective e-learning in the Australian Army
- to develop a model of factors influencing e-learning effectiveness in large, dispersed workplaces.

Using a comparative analysis process within a grounded theory approach has suggested a framework for applying the IECM in further research. There was little evidence of a socio-cultural exploratory approach being used in other research into e-learning effectiveness factors. A proposed research framework for applying the model to understand the alignment of factors influencing e-learning effectiveness is presented in Chapter 9. While developing a formal model was not an initial aim of this study, some concepts in the IECM are also briefly compared with some relevant theoretical literature to improve the theoretical understanding of the model as a basis for further research.
Chapter 9  A proposed E-learning Comparative Alignment Framework

9.1 Introduction

Chapter 9 provides additional research propositions to the original aims of the thesis. This thesis contributes to an identified gap in the literature by providing a model of factors influencing e-learning effectiveness, the IECM, which is grounded in the experiences of the Australian Army. Comparison of the IECM with some empirical studies indicated its potential usefulness for research in other workplaces. A framework for using the model is proposed in Chapter 9, which can be adapted by researchers or practitioners to understand the influences on e-learning effectiveness in an organisation.

The proposed *E-learning Comparative Alignment Framework* (ECAF) supports the mapping and alignment of e-learning stakeholder concerns across the factors influencing effectiveness, which are identified in the IECM. The ECAF adopts the comparative analysis approach used in the thesis for identifying areas of alignment, which is termed for this study as a *comparative alignment process*. Suggestions for further research into the development of the framework and theoretical aspects are proposed in the chapter.

To understand the place of the IECM within the existing theoretical literature, a brief comparison was also undertaken with relevant theories of alignment. From the insights gained from the comparison of the model with the theoretical literature, it is proposed that to understand the factors influencing e-learning effectiveness it is necessary for organisations to adopt a *comparative alignment perspective to understand the integration of the e-learning culture into organisational culture*. The steps undertaken in this chapter are summarised in Figure 9.1.
Therefore, this chapter:

- presents the E-learning Comparative Alignment Framework (ECAF) using a comparative alignment process (9.2)
- discusses the concepts in the IECM with some relevant alignment theoretical literature (9.3)
- presents a conclusion to the chapter (9.4).

### 9.2 The need for an E-learning Comparative Alignment Framework (ECAF)

This research has indicated that the factors influencing e-learning effectiveness are dynamic, complex and interrelated. Organisations undergo constant change and e-learning approaches will continue to change as new technologies are introduced, as training and learning requirements change and as knowledge develops. As Hase and Ellis (2001, p. 33) point out ‘In many respects it will probably always be “work in progress” given the rapid rate at which technology is progressing’. Similarly, from a VET context, an Australian Flexible Learning Framework report (Eklund, Kay & Lynch 2003) indicated the need for a research process or methods to understand changing learning environments:
The only certainty is change, and the only way to effectively accommodate change is through having sound processes. These are processes for identifying the needs of the learner, for designing experiences that efficiently meet objectives, for choosing appropriate technologies and creating motivating learning designs, and for measuring learning outcomes (p. 28). Thus, changing workplace environments require dynamic and systematic approaches to understanding the interrelationships and influences on e-learning effectiveness.

In discussing the issues of e-learning implementation, Hase and Ellis (2001) highlighted two ‘systemic’ problems that required further research. These were the dominance of teacher-centred approaches and the requirement for the alignment of the needs of all stakeholders in the design and delivery of courses. They summed up the need for alignment-based research for e-learning implementation in terms of the need for the development of a model:

A model could be built for any organisation moving from traditional modes of education to online education and that model should identify stakeholders, key issues and the level of understanding/skill/resources that are present. If these areas could be mapped onto a series of stakeholder diagrams then areas of poor alignment could be identified. If this was done early in the process then there would be an opportunity to redirect information and resources so as to improve alignment and hence the overall outcome of the project (Hase & Ellis 2001, p. 33)

While Hase and Ellis were taking a higher education perspective to e-learning implementation, their comments reflect the thesis proposal of the necessity to align stakeholder perspectives of e-learning activities with the workplace culture.

A recent comprehensive overview of the e-learning effectiveness literature in workplaces (DeRouin, Fritzche & Salas 2005, p. 934) highlighted a gap in the research, ‘we are aware of no theory that has been the major influence in the design, delivery, and implementation of e-learning systems’, and they further argue:

Without theory, practitioners have to rely on fragmented advice from researchers who do not have the research results to inform designers on how to use various e-learning options to create an environment that effectively and efficiently promotes positive learning outcomes.

Organisations need a framework that can accommodate the complexity of factors that develop the e-learning culture. The framework needs to be flexible to reflect the dynamic environment as an organisation adopts and adapts e-learning to suit its changing priorities.
It is proposed that using comparative alignment processes within a framework based on the factors that influence e-learning effectiveness from the IECM provides a useful approach.

### 9.2.1 A proposed ECAF

The IECM presents the four main factors influencing e-learning effectiveness in a large, dispersed workplace. The interaction of these factors informs the understanding of the assumptions, goals and processes that form the e-learning culture. These four main factors are represented in Figure 9.2, which forms the basis of the proposed E-learning Comparative Alignment Framework (ECAF).

![Figure 9.2 The four factors that form the basis of the E-learning Comparative Alignment Framework (ECAF)](image)

The IECM also includes the interactions between the main factors influencing e-learning effectiveness that create alignment areas, which influence e-learning effectiveness concepts, such as sustainable e-learning, effective learning opportunities, effective learning and effective training.

The alignment area between the organisational priorities factor and the learning environment factor influences the development of a sustainable e-learning environment (Figure 9.3).

![Figure 9.3 An E-learning Comparative Alignment Framework showing the alignment area (shaded) that influences the development of a sustainable e-learning environment](image)
The area of alignment between the organisational priorities factor and the learning environment factor influences the support of relevant learning opportunities (Figure 9.4).

![Figure 9.4 An E-learning Comparative Alignment Framework showing the alignment area (shaded) that influences the support of relevant learning opportunities](image)

The area of alignment between the learning environment and the instructor’s role factor influence effective learning (Figure 9.5).

![Figure 9.5 An E-learning Comparative Alignment Framework showing the alignment area (shaded) that influences effective learning](image)

The area of alignment between organisational priorities and learners’ needs influence the delivery of effective training outcomes (Figure 9.6).

![Figure 9.6 An E-learning Comparative Alignment Framework showing the alignment area (shaded) that influences effective training](image)

Therefore, the ECAF indicates the necessity to consider the four e-learning effectiveness factors to understand the assumptions, goals and processes in the e-learning culture.

### 9.2.2 A comparative alignment approach

Using the comparative analysis approach in the thesis research indicated that it provides a systematic method to understand the factors influencing e-learning effectiveness across an organisation. It is proposed that using the ECAF with a comparative analysis approach can
assist to identify areas of alignment (and misalignment) in the assumptions, goals and processes in the e-learning culture.

Using a comparative analysis approach to identify issues based on stakeholder concerns to inform grounded theory was relevant for the research aim of this thesis. However, developing a model or theory from research analysis is not always the aim of applied research and it may not be relevant to planners or practitioners of e-learning projects. Rather than using comparative analysis to establish a core concern for all respondents to inform theory building, the focus can be on establishing areas of relative alignment, using the ECAF as a guide. By basing data collection and analysis on the comparison and alignment of the main stakeholder concerns across the main four factors, it is proposed that using a *comparative alignment approach* would be useful for practitioners and applied researchers.

A comparative alignment approach would involve the following steps:

- gaining the perspectives of the main stakeholder groups (managers, instructional designers, instructors, students) across the four main factors (organisational priorities, learning environment, instructor’s role, learners’ needs)
- comparing the main concerns to generate concepts
- locating these concepts in relation to the main factors
- mapping and comparing the concepts across the main factors to determine where the main areas of alignment or misalignment exist, and
- mapping and comparing communication processes in the workplace culture influencing e-learning integration.

Using a comparative alignment approach with the ECAF encourages the application of established principles of inductive exploratory research while providing researchers with a model to apply and adapt to a particular e-learning situation. Suggestions for using this approach are provided in sections 9.2.1.1 to 9.2.1.5.

### 9.2.2.1 Gaining stakeholder perspectives

The stakeholder focus questions will reflect the stage of e-learning use and the intentions of the research project. The research aims could be to understand expectations prior to implementation, experiences of a pilot study or overall perceptions of advantages or disadvantages of e-learning after some experience of use. The twenty focus questions
developed for each of the main factors in section 8.2 can guide the data collection and analysis processes.

The factor-based questions are open and exploratory and can be modified to encourage stakeholders to explore the role of e-learning and perceptions of e-learning in relation to the organisational culture. Open-ended, exploratory questions will facilitate respondents to reveal assumptions, goals and experiences within their context, which are the e-learning culture. While using pre-determined questions reduces the exploratory nature of the research, these questions have emerged from grounded theory research, and so are likely to be relevant in other workplace situations.

Qualitative methods, such as interviews and focus groups, provide respondents with the opportunity to provide in-depth views. However, using a semi-structured questionnaire, which can include quantitative data, will assist in focusing the research effort. As indicated in this research, comparing multiple sources of data can be facilitated using a comparative analysis approach. The further development of a questionnaire for use in organisational e-learning effectiveness research, based on the IECM, will be a focus of future research.

Whether to use external or internal researchers also requires consideration. An external researcher will not necessarily have an understanding of the organisational politics and culture. However, respondents can feel comfortable expressing controversial views to an outsider. An internal researcher will have insider knowledge of the politics and culture of the organisation, which will facilitate in accessing a cross-section of views, but they would also need to encourage respondents to express controversial views.

9.2.2.2 Comparing the main concerns to generate concepts

The main concepts included in IECM (section 8.2) can be used as a guide for data collection and analysis as they were found to be relevant for the workplaces in this research:

- organisational priorities (e-learning policy, technical infrastructure, workplace culture)
- learning environment (learning environment design, learning environment delivery)
• instructor’s role (shifting role, reclaiming position)
• learners’ needs (learner characteristics, learning strategies).

By using the method of comparative analysis outlined in this research and comparing incident with incident, incident with concept and concept with concept, an overall understanding will be gained of the main concerns for respondents. The aspects of the ECAF shown in Figures 9.2 to 9.6 assist the researcher to focus on the main factors in order to understand the concerns that are being raised by the stakeholders. In a large, dispersed organisation, these factors tend to reflect the perspectives of managers, instructional designers, instructors and learners. Each stakeholder group may raise issues that reflect similar or different concerns, which can then be compared.

9.2.2.3 Mapping and comparing the concepts

After the concepts are determined for each of the factors, these concepts are then mapped on the ECAF to reflect the contexts of the concept. Where a concept is raised within the context of each of the factors then this concept is entered under each factor. Where a concept was not related to a factor by the respondents, then this area is left blank in the relevant factor. An example of this comparative alignment process is provided in Figure 9.7.

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<thead>
<tr>
<th>Organisational priorities</th>
<th>Learning environment</th>
<th>Instructor’s role</th>
<th>Learners’ needs</th>
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</thead>
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<tr>
<td>E-learning policy</td>
<td>Technology infrastructure</td>
<td>Workplace culture</td>
<td>Learning environment design</td>
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</table>

Figure 9.7 An example of using an E-learning Comparative Alignment Framework approach to map concepts (C) across the four main factors

This mapping process indicates the main concepts within each main factor and allows comparisons within and across the factors. The concepts in this case have been labelled C1, C2 etc. In the example in Figure 9.7, there is most alignment within and between the workplace culture and e-learning design factors. There is less alignment within the learners’ needs factor and in the learning delivery environment. Using the ECAF highlights where areas of alignment are concentrated and thus indicates the issues that
could be supporting e-learning effectiveness. Misalignments or blanks in the ECAF reveal tensions that are influencing e-learning effectiveness. In turn, this process can be considered to reveal the alignment and misalignment of the assumptions, goals and activities in the e-learning culture.

If a concept has opposing views, these views could be separated into two concepts or be covered by an overall concept. For example, a priority for independent learning and a priority for instructor-led training could be called ‘learning independence levels’. Alternatively, a system indicating positive alignment (+) or negative alignment (−) could be developed. As a part of this research (Newton & Ellis 2005b), a similar coding system was used to indicate positive or negative influences on the uptake of Web-based learning in the Australian Army. Other coding systems could be developed to reflect relative alignments and priorities, or different contexts of alignment, and will be a focus for further research.

9.2.2.4 Determining alignment areas

Mapping the alignment of the concepts across the main factors also highlights major areas of alignment or misalignment (Figure 9.8).

Figure 9.8 An example of using an E-learning Comparative Alignment Framework approach to map alignment of concepts (C) and alignment areas (dashed line indicates a wrap-around of this factor)

Where there is an area of alignment, there is likely to be support for the integration of e-learning into the organisation. For example, in Figure 9.8, the concept C2 was aligned across all of the main factors, indicating a range of alignment areas. For example, the concept C2 alignment could indicate that the provision of standardised content in e-
learning courses was a priority for managers, instructional designers, instructors and learners. This concept supports e-learning effectiveness outcomes in all of the alignment areas.

Alternatively, concept C4 was aligned across organisational priorities and the learning environment, indicating support for a sustainable learning environment. However, this issue was not mentioned within the instructor’s role or learning needs factors. This situation could represent an organisational priority for enculturation in e-learning design using virtual mentors, which was not raised by learners or instructors as an issue. The relevance of this concept for providing effective learning or training outcomes could be considered as a result of this comparative alignment.

It could also be possible to introduce a quantitative perspective of areas of alignment by counting the number of times each concept was mentioned in a factor. This would provide some indication of the relative strength and weakness across the alignment areas. However, the usefulness of adopting a quantitative approach will require further research.

A process of mapping and comparing alignment within factors and across alignment areas could be used at different stages of e-learning adoption and use. For example, prior to e-learning use, the alignment areas would reflect areas of expected relative support and tension, which could inform further consultation and planning. After e-learning implementation, the alignment areas would indicate existing factors influencing e-learning effectiveness, which can be addressed. An ECAF could also be used to understand the impact of introducing a change, such as a new technology or a new training policy, in order to understand the alignment of expectations and current experiences across the organisation.

9.2.2.5 Mapping and comparing communication processes

After the concepts and alignment areas have been mapped across the ECAF, it would also be possible to include the communication factors influencing e-learning effectiveness. A proposed example of mapping and comparing communication processes is shown in Figure 9.9.
Communication processes (aligning, balancing, co-ordinating, reconciling) were an essential part of the IECM to encourage alignment within and across the main factors. Data collection from the various groups of stakeholders will provide a cross-section experiences and perceptions, and indications of the communication processes between the four factors should emerge. These issues could also indicate directions of communication flows (e.g. one-way, two-way). In Figure 9.9, there is little two-way communication available to communicate learners’ needs. This could indicate a need to provide learners with more avenues to give feedback. Concept C5 indicates an issue that is communicated as an organisational priority reflected in the instructional design. It is influencing the instructor’s role and is also a feature of learner needs. However, there is no avenue for feedback about the instructor’s role or learners’ needs to the other factors.

Therefore, this mapping process using the ECAF indicates the priorities for communication and the gaps in communication that can influence e-learning effectiveness. One use could be to indicate where areas for formal and informal feedback are working and where improvements can be made. Understanding who has a voice and whose opinion is considered (or not) reveals the influence of the organisational culture on e-learning effectiveness.
This section has proposed an E-learning Comparative Alignment Framework (ECAF) that encourages researchers and practitioners to focus on the alignment of factors influencing e-learning effectiveness in workplaces. A method termed a ‘comparative alignment approach’ is proposed to enable comparison and alignment of issues for stakeholders across an organisation. This process provides understanding of areas of alignment or misalignment in stakeholder perspectives across key factors influencing e-learning effectiveness. Alignment areas indicate support, and misalignment areas indicate tensions for the integration of the e-learning culture into the organisational culture. The ECAF provides a framework to map the factors across management, design, delivery and use functions that are influencing e-learning effectiveness in organisations from the perspective of the people involved.

9.3 Comparison with alignment theories

While it was not a goal of this research to develop a formal theory, a comparison of the alignment aspects of the IECM with some relevant existing theoretical literature provided further insights into the theoretical and applied aspects. A literature search on the concept of e-learning cultural alignment revealed very little discussion and no theory or models. The term ‘e-learning integration’ was discussed primarily in terms of the use of blended learning modes (Hede 2002) or the integration of technology into teaching practices (Robertson 2004). A book that uses the term ‘e-learning integration’ (eds Jochems, van Merrienboer & Koper 2003) argues for the consideration of organisational factors, pedagogy and technology for effective e-learning. However, these articles are focussed on providing a constructivist approach in higher education contexts and concentrate predominantly on collaborative learning design aspects. Other papers provide recommendations that e-learning should be aligned with organisational culture with some examples of successes and failures (Leacock 2005; Overton 2005). The articles located about the influences of organisational culture were generally brief and anecdotal and did not provide any understanding of processes or methods of e-learning culture alignment and integration.

Some relevant theoretical literature across discipline areas relating to the concept of alignment is presented in section 9.3 and compared with the propositions from this thesis. Further insights into the models from this comparison are also presented.
9.3.1 Organisational priorities alignment

There is a need for research into methods that provide a focus on aligning stakeholder perspectives of e-learning in workplaces. Hase and Ellis (2001) were quoted in section 9.2 proposing the importance of alignment for effective e-learning. They propose that ‘a successful e-learning experience’ relates to the use of the concept of alignment as used in the human resource development and leadership literature. In particular, they mentioned Semler’s (1997) theory of organisational alignment.

Based on a review of the organisational alignment literature, Semler’s (1997, p. 27) definition of ‘organisational alignment’ provides support for the concept of understanding e-learning alignment and integration across an organisation, as is proposed in this thesis. His definition of organisational alignment is powerful: ‘a descriptive concept referring to the extent to which the strategy, structure, and culture of the organization combine to create a synergistic whole that makes it possible to achieve the goals laid out in the organization’s strategy’. Therefore, the IECM could be as considered as a way to identify the extent to which the alignment of organisational priorities, learning environment, learners’ needs and instructor’s role factors create a synergy to achieve e-learning effectiveness in an organisation.

E-learning use can be considered an organisational strategy. Thus, the ‘aspects of alignment’ that Semler proposed (pp. 28-30) are relevant to the IECM. For example:

- ‘structural alignment between goals of different levels of activity’, relates to aligning the main factors associated with e-learning effectiveness.
- ‘systematic agreement of rewards systems’, relates to aligning organisational priorities and the learning environment.
- ‘cultural aspects of alignment’ that includes the ‘cultural values’ in the organisation and ‘values implicit’ in the strategy relate to the alignment of the workplace culture and the e-learning culture.
- ‘performance aspects of alignment’ with some ‘measurement aspect of alignment’, is reflected in the comparative alignment approach.
- ‘environmental aspects of alignment’ that indicate the ‘strategic fit’ of the strategy with the external environment and reflects the ability of the organisation to ‘control or react to its environment’ is reflected in the alignment of e-learning
with changes required or imposed on the organisation through organisational priorities.

Therefore, Semler’s (1997) theory of organisational alignment provides some confirmation of the validity of the concepts of alignment developed in this thesis.

Semler argued that an organisation needs to ‘develop its own definition of success’ (p. 38). This argument supports the proposal of this thesis that e-learning effectiveness reflects the focus of the particular assumptions, goals and processes of the organisational culture. Semler also argued that ‘alignment is a measurement dimension that taps into the systematic agreement between forces within an organisation’ (p. 38). He provides some suggestions for correlating variables within the strategy to evidence of alignment with requirements, design, operations and effects throughout the organisation. This suggestion could be adapted to provide a quantitative approach to complement the comparative alignment method proposed in this thesis.

Semler (1997, p. 38) also makes the provocative statement that: ‘If an organisation selects a strategy that is not a good match with its environment, alignment will only cause it to fail faster’. This statement can be related to the situation in Figure 9.8. Alignment is present between the organisational priorities and learning environment factors. However, the misalignment with the instructor’s role and learning needs factors indicate a mismatch that could influence e-learning integration and effectiveness. Therefore, Semler’s concept of organisational alignment supports this thesis that the development of an e-learning culture that aligns with as many parts of the organisational culture as possible will assist e-learning effectiveness.

9.3.2 Technological alignment

The concept of ‘Information Technology (IT) alignment’ with business strategies (Curtin 2005a; 2005b; 2005c) is also relevant to this thesis. Curtin’s research indicates that strategic IT alignment has been discussed in terms of aligning IT provision policies with the organisational priorities. This parallels the ECAF in terms of aligning e-learning policy and technical infrastructure. Curtin (2005c, p. 1) summarises the history of strategic
alignment over the last twenty years, indicating that the concept of aligning IT plans with business plans has been ‘enjoying remarkable longevity’ and that ‘the interest is growing’. Curtin uses the ‘Strategic Alignment Model’, originally developed by Henderson and Venkatramon, to indicate ‘four domains of strategic choice’ (Curtin 2005c) (Figure 9.10).

![Figure 9.10 The Strategic Alignment Model presented in Curtin (2005c, p. 2)](image)

There are parallels between the suggested use of the ECAF and this model of strategic alignment. Curtin discusses identifying ‘external and internal domains of strategy’ (Curtin 2005c, p. 2), which is a similar approach as understanding alignment within and between the main factors in the ECAF. Curtin explores the horizontal and vertical relationships of the strategic alignment model (2005b; 2005c). This exploratory approach is similar to the understanding of areas of alignment presented in Figures 9.3 to 9.6. The need for ongoing alignment processes to encourage strategies to evolve to reflect organisational changes was described as ‘the “trip” through a series of perspectives of alignment’ Curtin (2005a, e.p). These parallels in structure and function between the ECAF and an established model of strategic alignment add to the framework.

Curtin (2005a) also discusses how organisations can use the model to determine the focus of the business-to-IT relationships. These mapping processes indicate uses for the ECAF. For example, Figure 9.11 indicates an organisation driven by business strategy but lacking an infrastructure strategy (Curtin 2005a, p. 2).

![Figure 9.11 A strategic alignment model driven by a business strategy but lacking an infrastructure strategy (Curtin 2005a, p. 2).](image)
Applying this approach to the ECAF would allow an organisation to consider the main drivers influencing e-learning effectiveness. For example, Figure 9.12 indicates that the factors influencing e-learning effectiveness are predominantly being driven by organisational priorities and that the learning environment has been ignored. This situation could develop if external independent e-learning courses are bought in to meet organisational priorities and learners’ needs (e.g. compliance training), which influence the instructor’s role, without considering the impacts of the learning environment (e.g. providing a time and place to study).

![Figure 9.12 An E-learning Comparative Alignment Framework driven by organisational priorities and lacking consideration of the learning environment](image)

Alternatively, Figure 9.13 indicates that the factors influencing e-learning are predominantly being driven by the learning environment and that organisational priorities have not been considered. This situation could occur when a LMS is implemented without considering the organisational priorities for training (e.g. incompatibility of the LMS with the human resources system), which influences the instructor’s role and learners’ needs. This situation would result in tensions in e-learning environment sustainability and in training outcomes.

![Figure 9.13 An E-learning Comparative Alignment Framework driven by the learning environment but lacking consideration of organisational priorities](image)

Curtin uses these IT strategic alignment models to indicate types of organisations and different ‘paths through alignment’ (2005a, e.p). This is a useful concept as it highlights the necessity for organisations to adopt approaches that allow for change and development, particularly as technologies change, to suit their particular context. Further
research to explore the relevance of some of these concepts from IT strategic alignment theory to e-learning effectiveness is warranted.

9.3.3 Instructional design alignment

While alignment has been related to project management methods for many years, the concept of alignment has only recently appeared in the instructional design literature (Villachica, Stone & Endicott 2004). An alignment model for Web-based training development was recently proposed by Byers (2005) as an approach for project managers to transform existing face-to-face courses into e-learning courses, or to create new e-learning courses in workplaces. As the Byers’ alignment model focuses on instructional design and development of courses, the alignment processes described relate primarily to the learning environment factor in the IECM. Using the five phases of the Instructional Design Model (analysis, design, development, implementation, evaluation), Byers identifies actions that inform these five phases and the stakeholder groups who need to be included for modified or new e-learning program development (pp. 349-350).

The model proposed by Byers’ (2005) supports the need for gaining stakeholder perspectives and encouraging the interaction and involvement of all groups of stakeholders in e-learning course development. Byers proposes that by understanding the actions required in project management and aligning these roles with the relevant stakeholders, training developers can ‘make it an effort of internal cooperation’ (p. 357). ‘Mutual effort’ results in the sharing of project goals across operational units: ‘each with its own needs and political reality’ (p. 357). While there was an indication of awareness of the influences of workplace culture in Byers’ study, this thesis indicates the necessity of articulating and aligning these aspects of the workplace culture in considering e-learning effectiveness.

The need for continual alignment processes during the design and development stages of e-learning course development was mentioned by Byers (2005, p. 354): ‘The alignments initiated during the design phase should be maintained and reinforced throughout the entire project’ with a focus on managing or ‘weaving’ stakeholders’ activities into the ‘final training product’ (p. 357). This ‘weaving’ concept descriptively supports the concept of e-learning culture alignment and integration proposed in this thesis. However,
Byers has not linked instructional design management to the organisational culture or the development of the e-learning culture.

There is an inherent focus in Byers’ research on developing an e-learning course as a product. While Byers’ proposed including a range of stakeholders in the development of an e-learning course, this thesis has indicated that understanding the factors influencing effective e-learning is more than simply developing a product. Identifying and making transparent the assumptions, goals and processes in the design and delivery of e-learning across the organisation are essential. Therefore, a broader conceptualisation of alignment, beyond the development of a course as a product, is required to encourage the effective integration of e-learning into an organisation.

9.3.4 Learning alignment

Another area related to e-learning that uses alignment concepts is ‘constructive alignment’ as proposed by Biggs (1999; 2003). Biggs presents two interrelated principles of constructivism in learning (‘what the learner does’) and alignment in teaching (‘what the teacher does’) based on education settings. These principles focus on the teacher aligning the teaching system and assessment tasks with ‘the learning activities assumed in the intended outcomes’ (Biggs 2003, e.p). While it is important for e-learning courses to be constructively aligned, this thesis has indicated that additional external pressures, new technologies and the involvement of large project management teams can add to the complexity of creating and delivering effective learning opportunities. Understanding the influences on achieving constructive alignment in an e-learning workplace environment would assist in understanding e-learning effectiveness.

A figure adapted from Biggs (Engineering Subject Centre 2006) indicates the importance of focusing on alignment within the learning environment to achieve intended learning outcomes (Figure 9.14). The expectations and experiences of e-learning courses - the learning activities, teaching activities and assessment - need to fit into these intended outcomes.
The concept of constructive alignment supports the proposal of this thesis, that the beliefs and understandings about learners’ needs need to be balanced with the decisions about learning strategies and aligned with the priorities of the workplace culture. The intended learning outcomes need to include an awareness of both the implicit and explicit enculturation aspects of content, course design and delivery.

Similarly, Biggs (2003, e.p) refers to constructive alignment as a good approach for revealing the ‘hidden curriculum’ in course content and teaching. The assumptions inherent in technological determinist priorities for e-learning use and the resulting difficulties for learners can also indicate the hidden curriculum (Anderson 2002).

When using the constructive alignment concept, intended outcomes need be made explicit throughout the management, production, delivery and use of e-learning. Any non-intended outcomes need to be considered and explored in terms of alignments or misalignments in the e-learning culture and e-learning integration. Further research could examine the influence of workplace e-learning hidden curriculum on e-learning effectiveness.

Biggs’ model (Figure 9.14) requires that e-learning activities and learning support activities to be aligned with assessment methods and intended outcomes. In workplaces, there is often the need for staff to demonstrate practical knowledge and skill competencies to gain either formal or informal recognition of knowledge, attitude and skills. Shifting learning from workplace situations or from face-to-face demonstrations and practical sessions to e-learning can potentially create constructive misalignment, where the design of the e-learning activities does not match the design of the assessment methods to achieve the intended learning outcomes. The decision to shift to independent learning from instructor-led training could also potentially create constructive misalignment, where the e-learning activities do not provide adequate support for the learners to gain the require outcomes or to be assessed to achieve the intended outcomes.
The decision to use mixed training delivery modes reflects assumptions and expectations of alignment with intended learning outcomes. It is proposed that achieving constructive alignment with e-learning would require more than the adoption and use of different modes of course delivery. Effective blending of appropriate technologies and learning activities would require the alignment of training priorities, learners’ needs, e-learning design and delivery and instructor’s roles in order to achieve constructive alignment within the workplace culture. Further exploration of how blended learning is being defined and used in terms of alignment factors would inform more effective e-learning. Therefore, constructive alignment processes could provide insights into using the IECM to provide an effective blended learning environment.

The comparison of the IECM concepts with some relevant theoretical literature has indicated support for these concepts and provided further insights in the model. The concept of alignment is recognised as a relevant, and at times a powerful concept, in managing organisational strategies, instructional design, technology and learning activities. This thesis has indicated that understanding comparative alignment processes across four main factors encourages effective integration of the e-learning culture into the organisational culture.

Using and developing existing alignment research approaches within the context of the IECM can inform further research. It could be worthwhile to consider the comparative alignment of the alignment theories as a way to further understand e-learning effectiveness (Figure 9.15).

Figure 9.15 Proposed e-learning comparative alignment of research approaches for integrating e-learning culture into the organisational culture
9.4 Conclusions

This chapter proposes an E-learning Comparative Alignment Framework (ECAF) and a process termed a ‘comparative alignment approach’. The framework encourages researchers to identify and map the factors across management, design, delivery and use functions, which are influencing e-learning effectiveness in an organisation. The models and processes presented are firmly grounded in the experiences of a large, dispersed workplace experienced in using e-learning.

It is proposed that using the framework could enable organisations to understand the areas of alignment and misalignment that are influencing e-learning effectiveness from the perspective of the people involved. Understanding the relevance and usefulness of e-learning comparative alignment for understanding e-learning effectiveness factors in other contexts will require further research. A summary of the main research outcomes from the thesis are summarised in Chapter 10.
Chapter 10   Conclusions and recommendations

10.1   Introduction

This chapter provides a summary of the research in relation to its practical and theoretical significance and highlights some specific issues that were raised particularly in relation to areas for further research.

Therefore, this chapter:

- summarises the main research outcomes in terms of their overall significance in relation to the research aims (10.2)
- summarises implications for practice (10.3)
- summarises implications for theory (10.4)
- summarises implications for methodological research (10.5)
- provides a summary of the overall thesis conclusions (10.6).

10.2   Main outcomes

The research achieved its aims, which were:

- to understand the factors that are influencing effective e-learning in the Australian Army, and
- to develop a model of factors influencing e-learning effectiveness in large, dispersed workplaces.

This research contributes to gaps in knowledge about the factors influencing e-learning effectiveness in large, dispersed workplaces. The wide range of competing priorities and discourses associated with e-learning effectiveness across education and training sectors were evident from an extensive overview of the scope of the existing literature (Chapter 2). From this literature review, it was evident that there was a need for exploratory research to inform the gaps about influences on e-learning effectiveness in workplaces. The Grounded Theory research approach was effective in providing stakeholder perspectives about factors influencing e-learning effectiveness in the Australian Army (Chapter 3). This study described and analysed the factors influencing e-learning effectiveness (organisational priorities, learning environment, instructor’s role and
learners’ needs) in an organisation previously closed to external research (Chapters 4 to 7). This study also informed the development of a substantive model for developing an integrated e-learning culture (Chapter 8). While the Army is a unique context for studying e-learning effectiveness, the factors that emerged as important were relevant to the issues described in studies of e-learning use in other large, dispersed workplaces (Chapter 8). Extending the original aims of the research produced an E-learning Comparative Alignment Framework (ECAF), which was compared with relevant organisational and learning alignment theories in the existing literature (Chapter 9). This framework potentially provides a new perspective for researching e-learning effectiveness factors in other education and training contexts.

This study indicated that the stakeholder assumptions, goals and processes associated with these factors develop the e-learning culture. Even within the highly hierarchical and authoritarian culture of the Army, diverse and conflicting perspectives of e-learning use were influencing effectiveness. Therefore, it is proposed that the e-learning culture is the socio-cultural construction of e-learning in the organisation.

This research established that the key to understanding e-learning effectiveness in an organisation is making the e-learning culture explicit. Comparison of the model developed from the Army research with some empirical research studies indicated that although the main factors could be generalised, there were indications that understanding e-learning effectiveness depends on the specific idiosyncrasies of the e-learning culture. This thesis provides a socio-cultural research approach that includes stakeholder perspectives to establish factors influencing e-learning effectiveness. As using a socio-cultural perspective was found to be wanting in the e-learning effectiveness literature, this thesis, therefore, informs gaps in research and practice.

This research has resulted in the publication of nine refereed papers (Ellis & Newton 2004; Newton, Ashman & Ellis 2005; Newton & Ellis 2004, 2005a, 2005b, 2005c, 2005d, 2006, 2007 (in press)) and a major report to Headquarters Training Command-Army (Newton 2005). As a sign of increasing institutional openness, Army personnel involved with this study have published co-authored papers, including with the researcher, and participated in national conferences to discuss their e-learning program in the public arena (Ashman & Ellis 2005; Greenberry 2004, 2005; Newton, Ashman & Ellis 2005). Brennan,
McFadden, and Law (2001, p. 64) concluded from an international literature review of e-learning effectiveness research: ‘The degree to which results of diligent and high-quality research percolate beyond their place of origin is questionable’. Therefore, this study addresses the inadequate research filtration into the public arena, from an organisation previously closed to external research, to encourage peer-review and discussion.

10.3 Implications for practice

Primarily, this thesis highlights that it is necessary to adopt the perspective that e-learning environments are not value-free. Researchers approaching large, diverse organisations need to contend with a wide range of factors including stakeholder expectations, priorities and perceptions; a range of hierarchies and bureaucracies; diverse and changing technologies and infrastructure; various geographical positions and cultures, and past and present training and learning experiences. Practitioners also have to contend with the influences of changing internal politics, and individual personalities, priorities and views. Practitioners and researchers in workplace organisations face additional barriers, such as confidentiality and competition, which can restrict gaining access to sites and staff and the publication of outcomes. This study provides researchers and practitioners with a model based on a comprehensive analysis of stakeholder perspectives across a large, dispersed organisation, which can be applied in other contexts.

Focusing on one aspect of e-learning activities or processes at the expense of others restricts understanding of the complexity of influences on effectiveness. The comparison of a broad cross-section of stakeholder concerns in the Army identified four main factors influencing effectiveness (organisational priorities, learning environment, instructor’s role and learner’s needs). This comparative analysis approach assisted in understanding the influences of the socio-cultural interactions and processes. Recommendations and suggested research questions that incorporate a socio-cultural perspective to understanding e-learning effectiveness were developed.

10.3.1 Recommendations for practice

The thesis provided recommendations at the end of each of the data analysis chapters (Chapters 4 to 7) focusing on the main concern of the Army respondents within each of the main factors. These recommendations were relevant to the Australian Army context,
and a comparison of the main concepts with some empirical research literature (Chapter 8) indicated the relevance of the concepts to other large, dispersed workplaces. These recommendations provide a focus for practitioners and researchers in other education and training contexts. The recommendations were:

**Organisational priorities**

- Aligning e-learning policies with organisational priorities assists in facilitating centralised support and investment in infrastructure to develop a sustainable learning environment.
- Aligning e-learning use with transformational aims in the training culture requires an understanding of the workplace culture and the need and ability to change the focus of training.
- Understanding the capabilities and diversity in the provision of the organisation’s computing infrastructure will assist in planning and developing effective e-learning.
- Understanding how different expertise is being valued and developed in the organisation and aligning skills and experience to support e-learning production and delivery improves the development of a sustainable e-learning environment.
- Providing effective two-way communication and feedback channels within the workplace culture encourages alignment of expertise and skills across e-learning production and delivery processes.
- Understanding how workplace culture influences on the responsiveness of course production processes to changes or diversity in the use of e-learning courses will inform a sustainable e-learning environment.

**Learning environment**

- Understanding the explicit and implicit enculturation processes in e-learning course design and delivery assists in developing effective learning opportunities.
- Co-ordinating e-learning design and delivery with existing technology provision priorities will assist in developing relevant learning opportunities.
- Co-ordinating e-learning design intentions with expectations of delivery practices will encourage the development of effective learning opportunities.
- Aligning course design and delivery modes with training priorities and learners’ needs and experiences will assist in developing effective learning opportunities.
Instructor’s role

- Understanding the impact of e-learning delivery on the instructor’s role will reduce uncertainty and facilitate effective learning.
- Understanding the position of instructors in the traditional training culture assists in defining the role of instructors to encourage effective e-learning.
- Reconciling shifts in the instructor’s role with the expectations of the training culture assists in encouraging support for the role in e-learning courses.

Learners’ needs

- Balancing the training priorities embedded in e-learning courses with the experience of diversity of learners’ needs assists in providing effective training.
- An understanding and provision of relevant support strategies for learners’ reading and computer levels of literacy needs to inform e-learning course design and delivery.
- Designing e-learning courses, particularly those providing core knowledge and skills, needs to be dynamic to respond to content changes and learner diversity to remain relevant to learners’ needs.
- Aligning expectations and experiences of different course delivery modes with summative assessment and workplace requirements can encourage effective training experiences.
- Understanding the role of interactions between peers and superiors within the workplace culture needs to be considered in designing e-learning courses to provide effective training experiences.

Therefore, this study indicated that in the Army and in the empirical studies examined, aligning the perspectives and experiences of a diverse range of stakeholders improves overall understanding of the influences on e-learning effectiveness.

10.3.2 Further research

Aligning the four main factors influencing e-learning effectiveness was found to be important in the Army and in the large, dispersed workplace studies included in this research. Further research will indicate the factors’ relevance in other education and training contexts. The wide range of e-learning contexts needs to be acknowledged and considered in effectiveness research. For example, it is expected that in smaller workplace
organisations there is likely to be an amalgamation of e-learning functions that may reduce tensions resulting from conflicting priorities. Alternatively, there could be a tendency for individuals to promote a specific viewpoint without consulting other areas of the organisation. In the education context, instructional design is often the responsibility of individual teachers or academics, which could result in merging and improved alignment of the learning environment factor and the instructor’s role factor. The introduction of an organisation wide LMS or externally developed e-learning courses or content could carry assumptions, goals and processes that conflict with the expected learning culture. Therefore, this research encourages practitioners to take a socio-cultural perspective to identify, compare and align the factors influencing e-learning effectiveness.

While recognising that established ways of understanding training effectiveness (e.g. Kirkpatrick’s model), measuring aspects of e-learning effectiveness (e.g. ROI) or comparing effectiveness (e.g. comparative media studies) have a place, this thesis has indicated that they carry with them inherent assumptions and biases about the conceptualisation of e-learning effectiveness (Chapter 2). By understanding that there are assumptions embedded in training evaluations approaches, it is possible to use these tools with a critical perspective. I have argued practitioners need to adopt the perspective that e-learning environments are not value-free. By considering the aims and assumptions inherent in the organisational culture, it is possible for practitioners to be better informed about the full range of factors influencing effectiveness.

This thesis has filled a recognised gap in the research for independent and comprehensive grounded studies of effectiveness issues for workplaces using e-learning. The research has generated practical recommendations and propositions that can be examined for relevance to e-learning effectiveness in other e-learning situations.

10.4 Implications for theory

This thesis presents a substantive model of factors influencing e-learning effectiveness - an Integrated E-learning Culture Model (IECM) (Figure 10.1).
The development and subsequent publication of this model (Newton & Ellis 2006) addresses the dearth of available substantive models identified in the e-learning effectiveness literature (Chapter 2). The IECM is firmly grounded in the Army stakeholder perspectives and so it is relevant to that context. Further comparison of the main concepts in the model with relevant empirical literature (Chapter 8) confirmed the validity of the model and its relevance outside the Army study.

### 10.4.1 Recommendations for research

The IECM assists researchers in understanding the discursive tensions associated with e-learning effectiveness and provides researchers with a focus for gaining stakeholders’ perspectives across four main factors influencing e-learning effectiveness. A series of research questions were provided in Chapter 8 based on the summaries of the theoretical aspects of each of the main factors. These questions provide a basis for a socio-cultural perspective of e-learning effectiveness across the four main factors. These questions were:

**Organisational priorities**

1. How do policy expectations (or lack of them) and implementation of e-learning use align with the workplace culture?
2. How do e-learning infrastructure policies (or lack of them) and implementation reflect the workplace culture?

3. What is the role of e-learning in training?

4. What is the role of e-learning in facilitating changes required in the workplace?

5. How is e-learning effectiveness defined and demonstrated by the alignment of e-learning policy and infrastructure provision with the workplace culture and training requirements?

Learning environment

6. How do e-learning design and delivery modes reflect the requirements of the workplace culture?

7. How does the learning environment technology support relevant learning opportunities?

8. How do the expectations of e-learning design reflect the experiences of e-learning delivery and use?

9. How do e-learning design and delivery modes align with learners’ needs?

10. How is e-learning effectiveness defined and demonstrated by the coordination of expectations and experiences of course design and course delivery?

Instructor’s role

11. How does the instructor’s role in e-learning reflect the training culture?

12. How does e-learning delivery influence the traditional instructor’s role?

13. How does the instructor’s role reflect the learning needs of students?

14. How are shifts in the instructor’s role with e-learning use being reconciled to encourage effective training?

15. How is learning effectiveness defined and demonstrated by shifts in the instructor’s role and reconciliation of the instructor’s role in training?

Learners’ needs

16. How do perceptions of learners’ needs reflect the priorities of the training culture?

17. How does e-learning design and use reflect an understanding of learners’ literacies?

18. How does the design and use of e-learning courses reflect the diversity of learners’ needs?
19. How is the understanding of learners’ characteristics balanced with experiences of learning strategies to encourage effective e-learning?

20. How is e-learning effectiveness defined and demonstrated by balancing learners’ characteristics and learning strategies?

By gaining stakeholder perspectives of the four main factors in the IECM and understanding the related alignment processes, it is proposed that researchers and practitioners can gain a better understanding of the influences on the integration of e-learning into the organisational culture. With integration comes improved support, a flow of ideas and feedback, and encouragement for responsive change and effective e-learning. Without integration comes tension, a stalling of ideas and feedback, resistance to change and ineffective e-learning.

Therefore, the IECM addresses a gap in the theoretical literature by providing a substantive model of factors influencing e-learning effectiveness based on the experiences of a large, dispersed organisation. Further research will be required to determine the relevance of this model in other education and training situations.

10.4.2 Further research

Chapter 9 provided the rational for the development of an E-learning Comparative Alignment Framework (ECAF) using a focussed comparative analysis approach based on aspects of the IECM. Further comparison of the alignment processes underlying the IECM and the ECAF to some relevant existing alignment theories indicated considerable parallels and provided further insights. This comparison with the theoretical alignment literature also indicated that the IECM and the ECAF provide a basis to consider the various types of relevant alignment theories (organisational, technological, instructional design, learning). This alignment approach offers a potentially novel way to view e-learning effectiveness factors.

By mapping the alignment and misalignment areas across the main factors influencing e-learning effectiveness based on the main concerns of stakeholders, the influences of the organisational culture on the development of an integrated e-learning culture become visible. This mapping process makes visible areas of alignment where the priorities and agreement exist. A potentially more useful outcome of this mapping process is that
misalignment areas (or gaps in the alignment) indicate issues where actual or potential tensions exist. Identifying these issues could assist in understanding the inherent social and political hierarchies and inequalities in the organisation and the organisations’ capabilities to consider change.

Chapter 9 indicates the relevance of some established alignment theories to the IECM concepts. Further research could focus on consolidating and applying existing alignment theories with the research presented in this thesis. Given the broad range of e-learning models that are being developed in workplaces, the concept of learning constructive alignment (Biggs 2003) to introduce independent learning strategies or use blended learning delivery modes to improve e-learning effectiveness, requires further investigation. It is also proposed that constructive alignment provides a useful approach to focus on effectively aligning e-learning approaches with organisational learning requirements, the learning environment, instructor’s roles and learners’ needs.

While this thesis has not explored the theoretical implications of ‘cultural transmission’ (Thompson 1990), social theorists have argued that the analysis of the impact of mass communications and the Internet on society, organisations and individuals, needs to ‘be fundamentally cultural’ (Slevin 2000, p. 7). The recommendations for practical and theoretical research from this thesis could provide a focus for researchers interested in the enculturation and the hidden curriculum aspects of e-learning (Chapter 9). While these concepts are discussed in the literature in relation to ICT implementation and to learning in general, the added potential for e-learning policies and technologies to carry embedded cultural features into the e-learning environment has not been explored to the same extent. The understanding of e-learning effectiveness as a mechanism for cultural transmission in an organisation could be further explored.

10.5 Implications for methodological research

This thesis also added insights into using an inductive, exploratory research approach for understanding e-learning effectiveness factors. There were few e-learning studies using a Grounded Theory research approach; however, this approach has been used to study the implementation of information systems in organisations (Fernandez 2004; Lehmann 2000; Lings & Lundell 2005).
While measuring or analysing one aspect or outcome of e-learning can inform practitioners and researchers of the impact of e-learning, the literature review (Chapter 2) indicated problems with potential bias and reductionism of the complexity of influences on e-learning effectiveness. Accepting that the selection of evaluation tools and methods also reflects the organisational priorities or culture can assist in understanding the conceptualisation and discourse of e-learning effectiveness in an organisation. Using a using comparative analysis approach, as described in Grounded Theory (Glaser & Strauss 1967), is valuable to gain an understanding of the assumptions, goals and processes in the e-learning culture from the concerns of those involved.

This research extended the original aims of the thesis due additional insights gained from the experience of applying the IECM to the literature. Reflections on the use of the IECM were discussed in Chapter 9, in terms of the E-learning Comparative Alignment Framework. This framework used the factors and concepts emerging from this research to provide a focus for further research into influences on e-learning effectiveness. The framework presents a way of using the IECM for further research in other contexts. Other researchers can use, examine and challenge the model and framework to develop further knowledge of e-learning effectiveness factors in workplaces.

In an area with little theoretical literature, using case studies and other empirical literature as data proved to be a valuable source of data for comparison with the analysis of the Army research. While the constraints of the contents of the articles limited this literature analysis, the method provided a useful approach. While Glaser and Strauss (1967) encourage the use of the extant literature as a source of comparative analysis data, this process is not very evident in the literature. Therefore, this thesis adds to the knowledge and application of using external research sources as data in grounded theory research. As case studies and anecdotal literature will continue to be published about e-learning effectiveness factors, this comparative analysis approach provides a method of distilling and fusing knowledge from academic and anecdotal industry sources.

10.6 Conclusions

This thesis informs the gaps in the practical and theoretical literature by providing a model for developing an integrated e-learning culture that is grounded in the experiences of the Australian Army. Although there is a growing body of knowledge about e-learning in
education and training contexts, there was a gap in understanding the factors influencing e-learning effectiveness.

This thesis highlights that while there are many advantages offered by e-learning use to meet the needs of stakeholders in large, dispersed organisations, the diversity of assumptions, goals and processes potentially exacerbate tensions and misalignment, which influence e-learning effectiveness. The study shows that the use of alignment processes across four main factors - organisational priorities, learning environment, instructor’s role and learners’ needs, improves the understanding of e-learning effectiveness.

Each organisation needs to consider, align and reflect on the assumptions, goals and processes associated with e-learning use to understand the factors influencing effectiveness. By taking the perspective that e-learning environments are not value-free, it is possible to align the competing priorities and discourses that influence how e-learning effectiveness is constructed and experienced. The understanding of e-learning cultural alignment assists in effectively integrating the e-learning culture into the organisational culture.

Providing well-researched studies and analysis of the expectations and experiences of e-learning in workplaces facilitates the development of relevant and useful knowledge for practitioners and researchers. By undertaking inductive research, using well-constructed analytical processes that aim to explore and align respondents’ expectations and experiences of e-learning, it is possible to gain an improved understanding of the factors influencing e-learning effectiveness.
Chapter 11 References


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**Chapter 12**