Tertiary e-Learning Research Funded Project

E-Learning Activities in Aotearoa / New Zealand Industry
Training Organisations:

Final Report

Report prepared by:

John Clayton & Richard Elliott
Emerging Technologies Centre
Waikato Institute of Technology

Project managed by:

Leah Wood & Doug Pouwhare
Electricity Supply Industry Training Organisation

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Abstract

i This research project, funded by the Ministry of Education through the Tertiary e-Learning Research Fund (TeLRF), investigated current e-Learning activities in Aotearoa / New Zealand Industry Training Organisations (ITOs).

ii For the purpose of this study e-Learning was described as learning that is enabled or supported by the smart use of information and communications technology (ICT).

iii The aim of the project was to produce a series of research reviews culminating in a final research report which would increase awareness in the ITO sector of the development and delivery of effective, cost efficient and educationally sound work-based and work-placed e-learning.

iv The project team also created and deployed an online interactive Web-space including a searchable database of ITO training managers in New Zealand. While this was primarily used as a research tool, it was also used to:

► inform stakeholders of developments in, and results obtained from, the various phases of the research project;

► be a resource warehouse of reports and findings from studies in industry and vocational e-learning initiatives nationally and internationally; and

► provide an area to facilitate ITO collaboration in e-learning activities.

v It was found a significant majority of ITOs are still coming to terms with the potential benefits and underlying concepts of e-learning. Therefore, few ITOs were actively engaged in the deployment of e-learning components such as creating online resources, delivering e-learning activities or evaluating the e-learning experiences of participants.

vi To increase the uptake of e-learning within ITOs the report concludes by making a number of significant recommendations.

Keywords

e-learning, industry training organisations, vocational education, industry training
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TeLRF Project Team
Doug Pouwhare: Project Manager:  Electricity Supply Industry Training Organisation
John Clayton: Research Manager:  Waikato Institute of Technology
Leah Wood: Project Administration:  Electricity Supply Industry Training Organisation
Richard Elliott: Research Analyst:  Waikato Institute of Technology

Project Reference Group
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Dr Tony Bates: Learning Technology Specialist, Tony Bates Associates: Canada
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Elizabeth Valentine: CEO, ATTTO, Industry Training Organisation, New Zealand
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Murray Deason: MPD Consulting, Hamilton
Terry Barnett: Chief Executive, North Tec

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PART A: OVERVIEW

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SECTION 1: EXECUTIVE SUMMARY

1.1 Context

1.1.1 The aim of the *e-Learning activities in New Zealand Industry Training Organisations* project was to produce a series of research reports culminating in this final research report. These reports were designed to increase awareness in the ITO sector of the development and delivery of effective, cost efficient and educationally sound work-based and work-placed e-learning. The initial reports also sought to determine the actual level of use of e-learning technologies in education and training programmes supported by the individual ITOs.

1.1.2 For the purpose of this report *e-learning* is described as learning that is enabled or supported by the smart use of information and communications technology (ICT).

1.2. Communication and Dissemination

1.2.1 Despite an intensive search of available literature in books, journals, in educational digital databases and on the Internet, it is evident there is a paucity of publications on the subject of e-learning in industry and vocational organisations in New Zealand.

1.2.2 The lack of readily available research, case studies, technical solutions and exemplars on the business and educational value of e-learning could be seen to be impeding the introduction of e-learning techniques and technologies within and across organisations.

1.2.3 While the creation of a dedicated web-space may provide access to a range of materials, this space will not provide organisations with the functionalities to:

- firstly, discuss e-learning initiatives with their peers;
secondly, create an interactive environment where ongoing collaboration can occur; and
finally, allow time constrained and focused e-learning discussion topics to be facilitated.

These functionalities can be delivered through controlled access Web-portals.

1.2.4 Given the unknown current technological literacy of staff in ITOs, it is unclear if the creation of a Web-portal on its own would have the desired effect on increasing the use of e-learning within organisations. Traditional dissemination strategies such as symposia, workshops and conferences should also be considered.

1.2.5 Recommendation 1:
It is recommended a consortium of ITOs led by the Industry Training Federation:

a. identify what successful implementation of e-learning means to ITOs
b. consider the creation of a demonstrator Web-portal where case-studies, templates and guide lines of best practice in e-learning implementations can be made available to inform senior managers across the ITO sector
c. facilitate focused and time constrained seminars and discussions, using a full range of synchronous and asynchronous tools once the portal is established
d. encourage ITO staff to facilitate workshops and present case studies demonstrating and focused on e-learning in ITOs at regional and national events organised by the sector.

1.3. Management and Planning

1.3.1 A critical issue impacting on the introduction of e-learning for ITO trainees is the mandated support, facilitation, monitoring and advisory role of the ITOs. The Industry Training Act (1992/55) indicates one of the roles of Industry Training Organisations is to ‘facilitate workplace learning for trainees in employment’. Although ITOs are not necessarily the “suppliers” of training there appears to be a dependence on the contracted “provider” for the incorporation of e-learning technologies in course materials, the development of appropriate learning support structures and assessment and evaluation procedures.

1.3.2 While the mandated role may prohibit ITOs from day-to-day delivery this does not necessarily mean they cannot influence “providers” to incorporate e-learning components in courses and programmes developed for their trainees. Organisations clearly need to indicate to providers the commitment of the ITO to implementing e-
learning methodologies. The major aims being to improve the quality of materials presented, the responsiveness of the provider to trainee queries, and the overall quality of the learning experience of their trainees.

1.3.3 This can be achieved by the development and implementation of organisational specific e-learning templates, policies and guides.

**1.3.4 Recommendation 2:**

*It is recommended individual ITOs create organisational specific e-learning templates, standards and procedures to guide providers in the creation of courses for the ITO detailing minimum expectations on the:*

- a. digital material created for the ITO;
- b. use of ICT in the presentation of course materials;
- c. effective communication between providers and trainees;
- d. management of trainee assessment activities;
- e. provision of on and off-line technical advice and learning support for trainees.

1.4. Evaluating e-Learning Capability

1.4.1 Currently ITOs have limited operational experience in the deployment and implementation of e-learning systems, applications and content. Therefore, discussions on e-learning tend to occur at a theoretical rather than practical level and organisational expectations around the impact of e-learning have yet to be fully articulated.

1.4.2 ITOs face a significant challenge in containing the cost of implementing e-learning, while maximising the training outcomes for trainees. In short, an organisation needs to ensure investments in e-learning design, development and deployment are meeting the needs of the learners, trainers and the organisation.

1.4.3 Organisations explicitly need to understand what they are doing, why they are doing it and the costs involved. A New Zealand developed tool, currently used across the tertiary sector, is the E-Learning Maturity Model (eMM). By working through the levels of eMM an organisation, through defined and managed processes, better understands what it is doing and where to focus resources to improve and refine successful developments. This detailed understanding of organisational
aspects of e-learning will allow institutions incrementally to improve their overall e-learning capability.

1.4.4 Recommendation 3:

It is recommended all ITOs participate in organisational capability reviews based on the eMM framework and focused on:

a. the review and assessment of current ITO e-learning capability;

b. the creation of organisational-specific strategic action plans based on these reviews and;

c. the development of a targeted investment approach by ITOs to supporting e-learning implementation.

1.5. Measuring e-Learning Success

1.5.1 Benchmarking is based on the concept of comparison and measurement and to be successfully implemented needs to be based on a recognised set of measurable indicators.

1.5.2 The results of the benchmarking process will help individual organisations illuminate strengths and weaknesses in their own, or their providers, e-learning activities. While the tools such as the eMM described above provide organisations with much needed data to improve their e-learning capability and capacity the model does not necessarily provide the simple indicators measuring the success of e-learning across the ITO sector.

1.5.3 It would appear to be appropriate, in this context, for ITOs to identify common basic e-learning indicators that could be used by all ITOs to provide a baseline from which to measure the uptake of e-learning in the New Zealand.

1.5.4 Recommendation 4:

It is recommended a consortium of ITOs

a. using the information provided in the literature review, identify a limited number of simple baseline indicators to measure e-learning uptake;

b. review and select an appropriate ICT system to facilitate the collection and comparison of data generated by the use of the indicators developed;
c. use the data to inform future development and incorporation of e-learning technologies in the ITO e-learning activities.

1.6. Sustaining e-Learning Implementations

1.6.1 Senior managers and staff in ITOs do not appear to be fully aware of the necessary technological capability of staff to introduce e-learning components in courses. There also seems to be a lack of awareness of the level of technological literacy needed by their trainees to fully participate in e-learning events or the appropriate technical capabilities of their providers to present appropriate e-learning content.

1.6.2 To ensure e-learning is not implemented in a haphazard, ad-hoc and fragmentary manner, appropriate and timely professional development needs to be provided to senior managers and / or those responsible for e-learning activities. The professional development offered should include:

- Pedagogical strategies in e-learning;
- Supporting and motivating students in e-learning environments;
- Searching, storing and displaying digital materials and;
- Evaluations of e-learning systems and applications.

1.6.3 While some professional development maybe able to be provided in short time constrained face-to-face workshops and symposia, this may not be sufficient to sustain e-learning initiatives. To gain the valuable experiences of being an “online learner” it should be considered that professional development offered should be online.

1.6.4 Recommendation 5:

It is recommended a consortium of ITOs

a. Review the availability of generic e-learning professional development offered by New Zealand tertiary providers and identifies appropriate courses and programmes to meet ITO needs

b. Negotiate with identified providers the provision of courses for the ITO sector

c. Encourage ITO staff to complete e-learning courses, participate in workshops and attended conferences focused on e-learning at regional and national events

d. Provide adequate professional development time to enable staff to upskill.
e. Provide opportunities to apply new skills
1.7. Technical Considerations

1.7.1 Currently ITOs' use of digital resources is primarily based on a personal computer delivery format, such as CDs, DVDs and computer based resources. ITO Web-sites are considered to be an important and useful tool for the ITOs to disseminate information to its stakeholders, customers, trainees, trainers and employers.

1.7.2 The widespread use of computers, e-mail, Web-spaces and the Internet appear to have become everyday applications in many ITOs. It appears the “time is ripe” to build upon this current ICT infrastructure and begin to further develop e-learning activities in vocational training and educational activities in a structured way.

1.7.4 There is a need for sophisticated levels of technical knowledge to be able to create and deploy an efficient and effective e-learning system. Issues such as ease of navigation and the provision of a range of synchronous and asynchronous tools to aide trainee-ITO communication need expert advice and attention. The provision of tools to present, store, and retrieve content and the ability to monitor, evaluate and administer the environment are also complex issues that need to be addressed. They are often beyond the technical skills and limited financial resources of many training organisations.

1.7.5 Many organisations in general seek an “out of the box” solution selecting and deploying well-proven ICT systems called learning management system (LMS), for example, Moodle, First Class and Blackboard.

7.6 Recommendation 6:
It is recommended a consortium of ITOs collaborate with providers to:

a. review the e-learning system needs of ITOs and create a check list of desired ICT function and;

b. use the check list as a guide by individual ITOs in the selection of LMS suitable for their trainees.
SECTION 2: THE E-LEARNING LANDSCAPE

2.1. Overview

2.1.1 This section has been divided into sub-topics. Topic one, defining e-learning, describes e-learning as learning that is enabled or supported by the smart use of information and communications technology (ICT). Topic two, levels of ICT integration, provides a framework to describe organisations’ use of e-learning tools. Topic three, teaching and learning with ICT, explores the changing role of e-learning tutors in e-learning environments.

2.2. Defining e-Learning

2.2.1 In the review of the range of e-learning courses and activities developed and delivered by training organisations and educational institutions, it is clear developers, providers and users appear to have different concepts of what is meant by e-learning. Activities and courses differ in the degree of interactivity occurring between learners and tutors, the multi-media richness of content developed and the delivery mechanisms used to manage the learning experience. Each training organisation and educational institution appears to be developing and delivering e-learning based upon the experiences of its tutors, the financial and physical resources available and the perceived learning needs of students.

2.2.2 In practice e-learning typically involves interactivity, such as student engagement with digital content, online interaction between learners and their instructors and online interaction between learners and their peers. It is facilitated by the use of a range of e-learning technologies. These could include all or any of: computers (stand-alone and networked), digital communication tools (such as chat, e-mail, forums, instant messaging, VoIP for virtual discussions) digital content creation tools (such as Wikis, Blogs and Web-folios) and digital content (such as web pages, CD-ROM and DVDs).

2.2.3 In some cases, such as in an instructor-facilitated video-conference, e-learning activities are carried out in ‘real-time’ and the activity undertaken is time-constrained and dependent on the attendance of all participants. This is known as synchronous e-learning.
2.2.4 In other instances, such as student engagement with a CD-ROM simulation activity, the learning will occur in ‘nominal-time’ and the activity undertaken is not time-constrained and is independent of other participants. This is referred to as asynchronous e-learning.

2.2.5 For the purpose of this study e-learning is described as learning that is enabled or supported by the smart use of information and communications technology (ICT).

2.2.6 For the purpose of this study m-learning refers to learning that is enabled or supported via the use of wireless communications-enabled devices (such as laptops, tablets, cell-phones, personal digital assistants (PDAs), or other similar devices).

2.3. Levels of ICT Integration

2.3.1 The levels of integration of the functionalities of Web-tools and the Internet differ from one training/vocational organisation to another. For example, some organisations may establish informational Websites providing potential learners with information on courses offered, on staff roles, their responsibilities, plus interests and qualifications. Physical and virtual resources available to students and maps illustrating the layout of the organisation, past, present and upcoming events and a range of policy documents may also be included. Other organisations may supplement these information resources with a range of employee and employer areas, making links available to external resources, units offered and tools to encourage interactivity.

2.3.2 Other organisations might deploy sophisticated learning management systems incorporating resource publication and presentation functionality. These will often include the ability to communicate asynchronously and synchronously, formal and informal assessment options, and access to student administration tools such as electronic logs, results and grades.

2.3.3 In essence, four levels of Web-tool and/or Internet usage can be identified and described:

- **Informational**: Information on upcoming training events, seminars, symposiums, trade shows and conferences are highlighted. The organisational profile, industry specific notices and regulations, pamphlets and brochures and links to government regulations are published.
> **Supportive:** Contact details of key training personnel, interactive online forms for queries and enrolment, links to course offerings of recognised training providers are embedded within the site. Opportunities to participate in competency-building courses in areas such as using computers, health and safety issues, labour regulations, and foundation numeracy and literacy are provided.

> **Blended:** While a number of the training opportunities offered may have a face-to-face component (such as scheduled weekly sessions or one-off block-courses), a number of the major training components such as written assessments, multi-choice quizzes, messaging and frequently-asked questions are provided online. Tutorials are provided using ICT tools.

> **Dependent:** All training activities such as management and administration (enrolment and reporting), resource delivery (notes, animations, and videos), grading and reporting (simulations, assignments, and assessments) are offered only through Web-tools and e-learning technologies such as computers and hand-held devices.

2.3.4 Organisational levels of use and the resulting Internet-Learner relationships created are illustrated in Figure 3.

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**Levels of Internet Use**

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*Figure 1. Levels of Internet use*
2.4. Approaches to Teaching and Learning Using ICT in Industry and Vocational Training

2.4.1 The introduction and smart use of ICT over the last three decades has significantly influenced the way training, instruction and education is conceptualised, developed and delivered. To put it simply, it appears unlikely the traditional face-to-face teaching mode of the transferring/broadcasting ideas, facts, processes and concepts wholesale into students’ heads (with trainers expecting them to remain intact or unaltered), can be sustained in e-learning environments. The concept of the tutor/trainer as broadcaster is illustrated in Figure 1.

![Tutor/Trainer broadcast](image)

Figure 2. Tutor/Trainer broadcast

2.4.2 The views of constructivism, that is the concept that knowledge is actively and internally constructed by the learner and not passively received from the environment in which they learn, can be regarded as a foundational philosophy of e-learning interactivity. The distributed, often geographically-spread, location of participants, the reliance upon information and communication technologies to maintain learning environments, the mediation of learning though interactive content alters teaching modes and learning strategies. Acceptance of these ideas will influence e-teaching, e-learning and e-learning activities. Traditional face-to-face strategies, techniques and approaches will be rethought. The focus will be on conceptual change and the development of understanding, rather than the piecemeal accretion of facts and formulas and the recall of knowledge. In short, the e-tutor is not the font of all knowledge. They should actively encourage student engagement with content while
facilitating the learning. The concept of tutor/trainer as facilitator is illustrated in Figure 2.

Figure 3. Tutor/Trainer facilitator

2.4.3 This fundamental shift, from broadcasting information to participant engagement means there is a need to foster learning e-environments supportive of conceptual change. It is important that teachers (trainers) and students (trainees) are aware of how their teaching and learning roles will change
SECTION 3: PROJECT METHODOLOGIES

3.1. Overview

3.1.1 The aim of the e-Learning activities in New Zealand Industry Training Organisations project was to produce an interactive Web-site and series of research reports culminating in a final research report.

3.1.2 The Web-site created was primarily used as collaboration, research and dissemination tool. The site was primarily designed to:

- inform stakeholders of developments in, and results obtained from, the various phases of the research project;
- be a resource warehouse of reports and findings from studies in industry and vocational e-learning initiatives nationally and internationally; and
- be used as an area to facilitate ITO collaboration in e-learning activities.

3.1.3 The reports designed to increase awareness in the ITO sector of the development and delivery of effective, cost efficient and educationally sound work-based and work-placed e-learning. The reports, previously published, are listed in the order produced below;

- Report 1: A Review of the Literature
- Report 2: A survey of e-learning activity in the ITO sector
- Report 3: Case studies exploring e-learning in ITOs

3.1.4 The remainder of this section of the report is divided into three topics, literature review, survey of e-learning activities in ITOs, and case studies. The topics provide details of the planning undertaken and the process followed during each phase of the project.

3.2. Literature Review

3.2.1 The first phase of the TeLRF project, the literature review was undertaken with the aim of answering the following questions:

- How prominent is e-learning in the industry/vocational training sector internationally and nationally?
3.2.2 Although numerous case studies, reports and resources were noted, the report was not designed to be a verbatim listing of national and international e-learning activities. Rather it was produced as a resource to increase awareness in, and inform the ITO sector of, the most appropriate approaches, strategies and techniques used in the development and delivery of effective, cost efficient and educationally sound work-based and work-placed e-learning.

3.2.3 The report was presented in four main sections:

- **The Landscape**: This section provides an overview of the industry and vocational educational and training sectors and reviews the possible impact of e-learning within the sector.

- **National and International Review of e-learning Initiatives**: A detailed analysis is provided of a selection of recent literature on e-learning initiatives in industry training organisations and the Vocational Education and Training (VET) sector and the impact these initiatives have had on the professional development of employees and the organisations themselves.

- **Implementation of e-learning; Approaches and Strategies**: Provides a summary of the various management approaches, including support and evaluation, institutions choose to use when introducing e-learning initiatives.

- **Emerging Trends**: Reviews the concept of flexibility and how this concept in conjunction with new and emerging technologies and mobile learning will shape future training and educational activities undertaken in vocational and industry education and training sectors.

### 3.3. Survey of e-learning Activity
3.3.1 The survey involved the completion of an online survey by ITO e-learning managers or their equivalent. Twenty three of the thirty nine Industry Training Organisations (ITOs) in New Zealand completed the survey.

3.3.2 The issues which formed the basis of the survey were derived from or related to:

- a review of the literature related to the industry and vocational training sector acceptance of e-learning, which was published in phase one of this project;
- feedback on the nature, structure and relevance of the survey and its questions, from a reference panel consisting of experienced national and international personnel from the industry and education sectors, plus members of the research team and;
- the Tertiary e-Learning Research Fund (TeLRF) decision to fund e-learning research that would provide a more comprehensive context and framework to inform strategic investment and decision making around the future of tertiary e-learning in New Zealand.

3.3.3 An online questionnaire was developed consisting of 81 items. It used a mix of checklists and 5-point Likert-type questions and text-box responses. It was divided into seven discrete sections. These comprised:

- How e-learning was currently used by organisations
- How e-learning was currently managed by organisations
- The capacity and capability of individual organisations to implement e-learning
- The potential benefits gained from the introduction of e-learning
- The potential barriers faced by organisations in the introduction of e-learning
- The perceptions of participants on the introduction of m-learning
- The perceptions of participants on the future of “e” and “m” learning in their organisations

The questionnaire in its final form is included in, *Part D: Appendices and References*, of this final report.
3.3.4 All e-learning managers, or their equivalent, in the 39 Industry Training Organisations (ITOs) in New Zealand were contacted by e-mail by the project team. This e-mail informed all recipients of progress made to date in the project and included the literature review from phase one of the project. It also provided a link to an interactive research Web-space and solicited their co-operation in completing the online survey. The initial e-mail was followed up with phone contact by a member of the project team.

3.3.5 Twenty three of the 39 ITOs responded to the survey and telephone interviews (approx 58%).

3.3.6 For the purpose of analysis it was decided to stratify the sample into 3 types of enterprise, small organisations (enterprises with below 1000 trainees enrolled) medium organisations (enterprises with between 1000 and 5000 trainees enrolled) and large organisations (enterprises with over 5000 trainees enrolled).

3.3.7 The small enterprise group consisted of 10 respondents which represent 25.5% of possible number of ITO respondents (39) and 43.5 % of actual respondents (23).

3.3.8 The medium enterprise group consisted of 7 respondents which represent 18% of possible number of ITO respondents (39) and 30.5% of actual respondents (23).

3.3.9 The large enterprise group consisted of 6 respondents which represent 15% of possible number of ITO respondents (39) and 26% of actual respondents (23).

3.4. Case Studies

3.4.1 Advocates of qualitative research argue case studies can produce more detailed information than that generally available through statistical analyses. While statistical methods might be able to deal with situations where behaviour is homogeneous and routine, case studies are able to deal with factors like innovation and context.

3.4.2 In contrast to quantitative techniques, case studies involve the collection and presentation of detailed information about a particular participant or small group. Therefore, conclusions drawn from case studies are “snap-shots in time” and only apply to that participant or group in a particular context at a particular point in time.
3.4.3 Constructivist methodology, where it is anticipated the researcher will elicit individual constructions then refine, interpret and compare them to constructions on which there is substantial consensus, was the main technique used in this study.

3.4.4 This study comprised three stages. Firstly, the Web-sites of the three ITOs participating in the study were reviewed. Secondly, formal face-to-face structured interviews with senior managers of the ITOs were conducted. Finally, telephone interviews with four trainees identified by these senior managers were undertaken.

3.4.5 In reviewing the Web-sites of the participating ITOs an evaluation matrix was developed. The evaluation matrix was divided into discrete sections. These sections focused on; Administration, Mode of teaching, Knowledge management and Assessment. The matrix is included in, Part D: Appendices and References, of this final report.

3.4.6 The issues which formed the basis of the structured and telephone interview prompts were derived from, or related to:

- A review of the literature related to the industry and vocational training sectors’ acceptance of e-learning, which was published in phase one of this project.

- The data gathered from an 81-item survey conducted with ITOs and reported on in phase two of this research project.

- Feedback on the nature, structure and relevance of the interview prompts, from a reference panel consisting of experienced national and international personnel from the industry and education sectors, plus members of the research team.

- The Tertiary e-Learning Research Fund (TeLRF) decision to fund e-learning research that would provide a more comprehensive context and framework to inform strategic investment and decision making around the future of tertiary e-learning in New Zealand.

3.4.7 The interview prompts contained approximately 20 items for senior managers and was divided into discrete sections. The interview prompts in their final form for managers are included in Part D: Appendices and References, of this final report.
3.4.8 Organisation X’s focus is in the services sector and the organisation facilitates the provision of a range of training opportunities for a number of service-focused staff. A number of their trainees are “field workers” and do not have ready access to e-learning systems or applications.

3.4.9 Organisation Y’s focus is in the primary industry sector and the organisation facilitates the provision of training for trainees who are practically focused with a “hands on” approach. A number of trainees are employed “outdoors” and do not have ready access to e-learning systems or applications.

3.4.10 Organisation Z could be regarded as multi-focused as it serves a range of different industry sectors. The variety of training facilitated is a reflection of the diverse communities it serves. A number of trainees are in practical or technically focused industries and do not have ready access to e-learning systems or applications.

3.4.11 In the reporting of the data generated during the interviews of senior managers a set pattern was followed.

- Firstly, the transcripts were reviewed and, when necessary, edited by the researchers. In essence this editing involved, the removal of repeated comments and also elimination of repeated phrases such as “you know”, “well”, “let me think”.

- Secondly, when reporting the data the “prompt question” was often used as an identifier to the response. In short the interviewers question was interwoven with the interviewee’s response.

- Thirdly, issues of specific importance to the interviewee were illuminated with the use of direct “verbatim quotes” and these were differentiated from the paraphrased and edited points by the use of *italics*. For example in analysing the data from organisation X the following was reported:

  > The issues preventing the wider use of e-learning technologies within organisation X (the interviewers prompt used as an identifier) *are mainly related to practical issues such as accessibility to computing equipment and the availability of broadband services and computing literacy* (the interviewees verbatim quote).

3.4.12 While the reporting of the data is based on the researchers ‘intuition’ formed by an extensive knowledge of the e-learning domain, it would be legitimate to argue
that prior conceptions held by the researchers influenced decisions made. It is acknowledged researchers at different ends of a theoretical spectrum could interpret the data in different ways and alternative conclusions would be legitimately reached. However, it is argued the conclusions drawn here serve to illuminate and reinforce the conclusions reported in the two previous phases of the research project and are therefore appropriate.
PART B: KEY FINDINGS FROM THE RESEARCH PHASES

Section 4: Introduction

Section 5: The current state of e-learning in ITOs

Section 6: Benefits of e-learning for Industry and Vocational Training

Section 7: Critical factors influencing the Introduction of e-learning Initiatives

Section 8: Barriers to the Introduction of e-learning

Section 9: Emerging and Mobile Technologies and ITOs

Section 10: Evaluation of e-learning capability

Section 11: Measuring e-learning Success

Section 4: Introduction

4.1 This section of the final report integrates the key findings of the three independent but interwoven phases of the e-Learning activities in New Zealand Industry Training Organisations project.

4.2 During the start up phase of the project the research team created and deployed an interactive Web-space. While this space was primarily used as a research tool, containing a searchable database of e-learning contacts in ITOs, it was also used to inform stakeholders of developments in, and results obtained from, the various phases of the research project. The full reports extensively used in this final study, and previously published, are available from the Web-site (http://ito.elearning.ac.nz).

4.3 This final phase of the project was undertaken with the aim of firstly, providing an insight into the current state of e-learning in ITOs. Secondly, it informs ITO decision makers of critical factors influencing the implementation of e-learning. Thirdly, it identifies key practices to measure e-learning maturity of ITOs and the success of e-learning initiatives and finally it explores emerging and future trends in e-learning.

4.4 This part of the final report has been structured to review the following key focus areas.
The current state of e-learning in ITOs

Benefits of e-learning for Industry and Vocational Training

Critical factors influencing the Introduction of e-learning Initiatives

Barriers to the Introduction of e-learning for Industry and Vocational Training

Emerging and Mobile Technologies and ITOs

Evaluation of e-learning capability

Measuring e-learning Success

4.5 In reviewing the key focus areas a set pattern was followed.

- **Selected Literature**: Relevant literature reviewed in phase one is presented.

- **Survey**: Data obtained from responses to the survey in phase two is presented and reviewed.

- **Case Studies**: Data obtained from structured interviews in phase three is presented and reviewed.

- **Summary of Key Findings**: The analysis of section findings is integrated.

4.6 For the purpose of this section of the report **e-learning** is defined as learning that is enabled or supported by the smart use of information and communications technology (ICT).

4.7 For the purpose of this section of the report **m-learning** refers to learning that is enabled or supported via the use of wireless communications-enabled devices (such as lap-tops, tablets, cell-phones, personal digital assistants (PDAs), or other similar devices).
Section 5: The Current State of e-learning in ITOs

Selected Literature

5.1 Despite an extensive search there was a distinct lack of publications, presentations and research reviewing the use of ICT and e-learning tools by New Zealand ITOs. The three papers described below have been prepared and published by researchers from tertiary educational institutions or are from commissioned reports.


In a 2003 survey, undertaken by Business NZ and the Industry Training Federation NZ, 89% of respondent organisations in New Zealand indicated they had allocated, through their payroll, sufficient financial resources to provide formal and informal training for their staff.

➢ The most prevalent forms of training were external courses and in-house training focused on health and safety, computing/ICT, management and supervision, communication skills and foundation numeracy and literacy.

➢ Significantly, training appeared to be organisation specific with in-house training staff, training consultants and private training providers delivering a significant portion of the firms’ needs.

➢ Individual specific formal training opportunities appeared to be offered by Industry Training Organisations, Polytechnics, Universities and Modern Apprenticeship coordinators.

➢ Although the predominant mode of delivery of support materials for the training offered was paper-based, computer-based and online support materials were also widely used and a number of firms (40%) indicated they would be happy to use online training materials.

This paper provides a definition of e-learning and also general information on strategies and guidelines for the successful implementation of e-learning in the workplace. Conditions considered essential to the effectiveness of workplace learning such as relevance to learner, clear goals and standards, clear instructions and regular feedback, are highlighted. The constructivist conception of ‘cognitive apprentice’ where the extensive knowledge already existing with “experts” in the workplace is used to guide and support learners is a key theme of the paper.


This report investigates the use and suitability of proprietary and open source learning management systems to support online and blended learning in New Zealand workplaces. It is useful as a guide for ITOs contemplating the adoption of a learning management system (LMS). The need for this study arose out of Christchurch Polytechnic Institute of Technology (CPIT) and Tertiary Accord of New Zealand (TANZ) experience with the Blackboard and Moodle learning management systems (LMS) for workplace delivery. Blackboard is a proprietary system, and Moodle is free open source software.
### Survey

#### 5.2 Seven questions were created in the survey exploring the current use of ICT and e-learning tools in ITOs as well as the availability, suitability and creation of digital content. The responses to these questions are detailed below.

**Q1 Use and/or creation of online content.**

<table>
<thead>
<tr>
<th>Question</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ITO staff create all of the digital learning materials required</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2. ITO staff create most of the digital learning materials required</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3. The creation of all of the digital learning materials is outsourced.</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4. The creation of most of the digital learning materials is outsourced.</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>5. &quot;Off-the-shelf&quot; learning materials are purchased from a private enterprise</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>6. &quot;Off-the-shelf&quot; learning materials are purchased from a tertiary education institute</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. All digital content created / purchased can be accessed and used by those with disabilities.</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8. Some digital content created / purchased has been designed to meet the language needs of our trainees (e.g. content in Te Reo or Pacifica languages)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9. All digital content created / purchased complies with international e-learning standards (for example Sharable Content Object Reference Model (SCORM))</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10. Access to digital content is not offered by our ITO</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>10</td>
</tr>
</tbody>
</table>

The responses indicate a substantial number of ITOs are involved in the creation of digital resources, while an observable trend is the tendency to buy “off the shelf” or “outsource” the development of content.
Q2 Information and communication technologies (ICT) used to facilitate the flow of information, on educational activities to trainees.

<table>
<thead>
<tr>
<th></th>
<th>Communication with trainees is by e-Mail</th>
<th>The use of computer TXT messaging has been utilised</th>
<th>The use of TXT messaging by mobile phone has been utilised</th>
<th>A dedicated Web-site is available with all relevant trainee information</th>
<th>Communication with trainees is by standard telephone</th>
<th>Communication with trainees is by mobile telephone</th>
<th>Information and communication technologies (ICT) are rarely used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>18</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>5</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>15</td>
<td>4</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

The data indicates a substantial majority of ITO's in all ranges are using a range of information and communication technologies to keep in contact with their trainees.

Q3 Delivery of e-learning activities.

<table>
<thead>
<tr>
<th></th>
<th>ITO staff facilitate all of the organisation's e-learning activities</th>
<th>ITO staff facilitate most of the organisation's e-learning activities</th>
<th>The ITO has outsourced the delivery of all e-learning activities for our trainees</th>
<th>The ITO has outsourced the delivery of most e-learning activities for our trainees</th>
<th>The ITO has a mixture of delivery options e-learning monitored by the ITO is mainly offered through an externally hosted learning management system (LMS)</th>
<th>The ITO has deployed its own learning management system (LMS)</th>
<th>No e-learning deliver options are used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>1</td>
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<td>1</td>
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<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<tr>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>12</td>
<td>7</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

The responses indicate a slim majority of ITOs do not consider they are delivering any e-learning activities. Although large organisations (5/6) appear to be more heavily involved in e-learning delivery.
Q4 Technologies ITOs have supported, employed or purchased in the last 12 months.

<table>
<thead>
<tr>
<th></th>
<th>Resources provided on Compact Disks (CDs)</th>
<th>Resources provided on Digital Versatile Discs (DVDs)</th>
<th>A Learning Management System (LMS)</th>
<th>Computer simulations</th>
<th>Access to digital learning resources remotely from a dedicated organisational Website</th>
<th>Audio and Video files for MP3 players and/or iPods</th>
<th>Computer games</th>
<th>Computer based learning resources</th>
<th>Emerging Web-based technologies (such as Blogs and Wikis)</th>
<th>Web-based learning resources</th>
<th>Information and communication technologies (ICT) are rarely used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
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<tr>
<td>2</td>
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<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
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</tr>
<tr>
<td>6</td>
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<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>2</td>
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<td>1</td>
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</tr>
<tr>
<td>9</td>
<td>3</td>
<td>2</td>
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</tr>
<tr>
<td>10</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The data indicates ITOs use a range of traditional digital resources (CDs, DVDs). Emerging digital creation technologies (Blogs and Wikis) are rarely used, while mobile digital presentation technologies (MP3 players) are not used at all.

Q5 Estimated proportion of the trainees participating in e-learning activities during the last 12 months.

<table>
<thead>
<tr>
<th></th>
<th>Zero</th>
<th>Less than 25%</th>
<th>26% - 50%</th>
<th>51% - 75%</th>
<th>Over 76%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>9</td>
<td>6</td>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

From the responses it is clear 50% of trainees involved with ITOs were not exposed to any e-learning experiences in the last 12 months (11/22).

Of those organisations who currently offer an e-learning experience (9/20), this is only offered to a small fraction (less than 25%) of their trainees.
**Q6** How will the adoption of e-learning approaches by your ITO change in the next 12 months?

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Increase</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Slow Increase</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Remain the Same</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Decrease Slowly</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Large Decrease</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

A significant majority of respondents (18/22) from large (6/6) medium (4/7) and small (7/9) organisations indicated a slow and steady increase in the use of e-learning technologies in the next 12 months. It should be noted a minor number of small (2/9) and medium sized enterprises (2/7) are not anticipating a change in e-learning adoption.

**Q7** How will the adoption of e-learning approaches by your ITO change in the next 3-5 years?

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Increase</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Slow Increase</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Remain the Same</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Decrease Slowly</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Large Decrease</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

A significant majority of respondents (19/22) from large (6/6) medium (6/7) and small (7/9) organisations indicated a slow and steady increase in the use of e-learning technologies in ITOs in the next 3-5 years. It should be noted a number of small (2/9) and medium sized enterprises (1/7) are not anticipating a change in e-learning adoption.
## Case Studies

### 5.3 Each participating ITO Web-site was evaluated against a set of benchmark criteria. The results were tabulated to enable direct comparison of structure (look and feel), navigation, ease of access and download, range of information about the ITO and for its trainees and potential trainees, additional resources plus ongoing administration and maintenance. The outcome of this evaluation is provided in the table below:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Website Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>The Web-site for organisation X provided comprehensive information on its role and function. It had separate sections for its mission statement, related policies, procedures and trainee information. There is also separate area which enables employers to obtain relevant information about education and training courses. There is facility for potential trainees to enquire about courses available to them and a frequently asked questions section relating to training courses. Specific information on the courses available to trainees, or on how or where training takes place, was not readily apparent.</td>
</tr>
<tr>
<td>Y</td>
<td>The Website for organisation Y was under review and in the process of reconstruction. Consequently the amount of information on the site was severely limited. However, the Web-site did have contact details for the ITO. This consisted of physical location, an email address and phone numbers. Because of the Web-site re-construction further evaluation of the site was not possible.</td>
</tr>
<tr>
<td>Z</td>
<td>The Web-site for organisation Z provided comprehensive information on its role and function. It had separate sections for its mission statement, related policies, procedures and trainee information. There is also separate area which enables employers to obtain relevant information about education and training courses. A separate area for potential trainees is available which includes details of training course that are currently available. Potential trainees are able to submit enquiries through the Web-site for information on courses and information on where training is likely to take place is included in the trainee section.</td>
</tr>
</tbody>
</table>
5.4 During the interviews with senior managers the prompt, *when and where does (or will) e-learning take place in your ITO*, was used to elicit responses on the delivery of e-learning activities by their organisation. The responses from senior managers are highlighted below.

**Organisation X** also had a web site to store *online resources for assessment*. From this web-site *assessors can … … get files on assessment* and although there … *is no e-learning for assessors as yet … this could … potentially change (if) when an LMS is employed.*

Currently, organisation X uses a *computer based system involved with an online initiative … … specifically designed for students at school, for ‘kids’ interested in the industry to get information*. This initiative has proved to be very popular and now a huge number of ‘kids’ are involved to varying degrees, *some in their twenties! Kept going after school to contribute to the growth and development of the resource.*

**Organisation Y** was keen to be *starting now and e-learning activities will be a staged implementation and will depend on resources available.*

**Organisation Y** has recognised the *need to do some work on where we need to be*. To move this strategic planning forward a *new position is to be advertised shortly and part of that person’s role will be directly involved with the development of e-learning initiatives.*

**Organisation Z** anticipated they would initially *pilot some Unit Standards which are currently under development. If all goes well will grow from there.*

Apart from the functionalities of a Learning Management System organisation Z believes all other applications and hardware are *currently available to users/trainees. Mainly through providers and through own resources.*

5.5 Summary of Key Findings

- Despite an intensive search of available literature in books, journals, in educational databases and on the Internet, it was clear there is a paucity of publications on the subject of e-learning in industry and vocational organisations
in New Zealand. This result has been mirrored by the findings of international reports in the same field.

- The widespread use of computers, e-mail, Web-spaces and the Internet has become everyday applications in many vocational and industry training organisations. It appears the “time is ripe” to build upon this current ICT infrastructure and begin to further develop e-learning activities in vocational training and educational activities.

- The ITOs use of digital resources is primarily based on a personal computer delivery format, such as CDs, DVDs and computer based resources, rather than on emerging Web technologies, such as Blogs and Wikis, or mobile display technologies, such as iPods and MP3 players.

- A majority of ITOs are still coming to grips with the concepts of e-learning and only a relative few organisations are actively engaged in e-learning activities such as promoting the creation of online resources, or evaluating the e-learning experiences of participants. This is supported by the lack of exposure to e-learning activities by ITO trainees.

- Currently e-learning methods, techniques and technologies are used sparingly by organisations. However, from the responses it is clear a substantial number of organisations are conscious of the value of e-learning and are anticipating within the next 1 to 5 years there will be a steady but significant increase of e-learning activities in their organisation.

- It is significant larger organisations (those with above 5000 enrolments) are more likely to be promoting and utilising digital resources than small (below 1000 trainees) or medium (between 1000 and 5000 trainees) organisations.

- ITO Web-sites are an important and useful tool for the ITO’s to disseminate information to its stakeholders, customers, trainees, trainers and employers. In general all ITO sites contain basic contact details (physical location, telephone and e-mail) to enable users to make further enquires about the ITO, their functions and the courses they facilitate.
Section 6: Benefits of e-learning for Industry and Vocational Training

Selected Literature

6.1 There is a distinct lack of publications and research reviewing the use of ICT and e-learning tools in New Zealand ITOs. There are however a number of publications from international organisations of a similar nature to the New Zealand ITOs (particularly from Australia, Canada and the UK) which highlight the benefits of e-learning in vocational education and training. The publications identified below can be considered useful as benchmarks and guides to inform e-learning initiatives in New Zealand ITOs.


This is an extensive report which is published in two volumes by the Australian Flexible Learning Framework. The first volume contains the main report and the second a range of case studies from various industries. The report identifies a number of benefits and barriers associated with online learning in regional Australia. The main benefits include the advantage for students of learning anytime and anyplace, thus removing the need to travel and hence reducing costs. They also include the development of new skills for the learner in problem solving, self-reliance and improved computer literacy skills. All of these were shown to improve learner confidence. The exposure of the learners to industry professionals from Registered Training Organisations (RTOs) also increased their confidence and contacts, which helped career development.


This very comprehensive and useful report was funded by the Learning and Skills Council in the UK. Its aim was to provide an objective, evidence-based overview of the current use and effectiveness of work-based e-learning and its integration with more traditional learning methods. Drawn from an extensive review of the literature, it also provides an international context. Specific objectives include:
• investigate the known impact of information and communications technology (ICT) and e-learning on the skills sector
• establish and describe the ways in which ICT and e-learning can support key workforce development issues such as addressing skills gaps and achieving sustainability in training and development
• report how ICT and e-learning can and is helping particular industry sectors
• identify gaps in provision
• identify where further work is needed to promote and embed the effective use of ICT and e-learning.

The report contends that greater access to learning and greater flexibility are significant benefits that organisations will look to e-learning to provide, rather than just cost reductions. Other benefits identified were improved flexibility in provision, greater access, financial savings, more up-to-date materials and increased learner participation across all levels.

**Survey**

6.2 Fourteen questions were developed in the survey exploring the perceived benefits of using ICT and e-learning tools in learning activities offered. The responses to these questions are detailed below.

**Q1 A significant degree of flexibility for trainees.**

<table>
<thead>
<tr>
<th></th>
<th>Major Benefit</th>
<th>Significant</th>
<th>Moderate</th>
<th>Minor</th>
<th>Not a Benefit</th>
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<tbody>
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<td>n=6</td>
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</tbody>
</table>

A significant majority (17/20) of all respondents saw the introduction of e-learning as bringing moderate to major benefits for its trainees. This was notable for all organisational types, large (5/6), medium (5/6), and small (7/8). No respondent regarded e-learning as not providing benefits to flexibility.
**Q2** Allows “just time in time” learning to be offered.

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<tr>
<th></th>
<th>Small</th>
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<th>Total</th>
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</thead>
<tbody>
<tr>
<td><strong>Major Benefit</strong></td>
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<td><strong>Minor</strong></td>
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<tr>
<td><strong>Not a Benefit</strong></td>
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</table>

A significant majority (15/18) of all respondents saw the provision of “just in time” learning as bringing moderate to major benefits for its trainees. This was notable for all organisational types, large (5/6), medium (5/6), and small (5/6). Few respondents (2/18) regarded “just in time” learning as not beneficial.

**Q3** Trainees can complete activities at their own pace.

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<tbody>
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<td><strong>Major Benefit</strong></td>
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<td><strong>Not a Benefit</strong></td>
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</tbody>
</table>

Providing trainees with the ability to study at their own pace was considered a moderate to major benefit for a substantial majority of respondents (20/21). Only 1 small enterprise respondent considered the provision of flexibility of pace to be of minor benefit and no respondent regarded flexibility of pace as not beneficial.

**Q4** Resources and activities can be accessed from anywhere at anytime.
The ability to access course materials anywhere anytime (flexibility of place) was considered a significant or major benefit by a substantial majority of respondents (17/20). Only 1 medium sized enterprise considered flexibility of place as not beneficial.

**Q5** Activities can be simultaneously delivered to an unlimited number of trainees.

Enabling employees or training organisations to deliver course materials simultaneously to trainees across the sector (flexibility of delivery) was considered a significant or major benefit to a substantial majority of organisations (17/20). Only 1 small training organisation considered flexibility of delivery as not beneficial.

**Q6** There will be an assurance of consistency of delivery of learning and teaching across the industry.

Ensuring consistency in the delivery
of teaching by using ICT tools was considered as a moderate to major benefit for a substantial majority of organisations (19/20). Only 1 respondent, from a medium sized enterprise, did not consider this consistency to be beneficial.

**Q7** *Will help reduce costs of delivery.*

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<tr>
<th>Major Benefit</th>
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<tbody>
<tr>
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</tbody>
</table>

The potential of reducing the costs of delivery of courses does not appear to be a significant driver for ITOs with a significant majority (15/20) noting this was at best a moderate benefit. However, it is notable that for smaller enterprises (5/8) this ability to reduce costs was a significant or major driver.

**Q8** *There will be a reduction in time it takes to deliver training.*

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<thead>
<tr>
<th>Major Benefit</th>
<th>Small</th>
<th>Medium</th>
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<th>Total</th>
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</table>

The potential of reducing the time it takes to deliver training, does not appear to be a significant driver for
Final Report

**Q9** It will attract new trainees.

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<th>Small</th>
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<th>Total</th>
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<td>Not a Benefit</td>
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</tbody>
</table>

The potential of attracting new trainees appears to be only a moderate to minor benefit for a majority of organisations (15/20). However, it is notable that for smaller (6/8) and medium (4/6) enterprises attracting new trainees through e-learning initiatives was a moderate to major driver.

**Q10** It will meet trainees’ expectations.

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</table>

Meeting the expectations of trainees was considered to be a moderate to major benefit for a
substantial majority of respondents (17/20). Only three respondents (one each from small, medium and large organisations) considered meeting the expectations of trainees as a minor benefit.

**Q11** It will meet employers’ expectations.

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<td>Major Benefit</td>
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</table>

Meeting the expectations of employers was considered a moderate to major benefit for a majority of respondents (15/20). However, it is notable a majority of small enterprises (5/8) considered meeting employers’ expectations to be only a moderate or minor benefit.

**Q12** Raising the ICT skill and competence level of trainees.

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<th>Medium</th>
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<th>Total</th>
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<tbody>
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<td>Major Benefit</td>
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</table>

Raising the ICT skill and competence level of trainees was considered a...
moderate to major benefit for the majority of respondents (15/20). However, half the number of small enterprises (4/8) considered this to be only minor or no benefit to them.

**Q13** Accurate tracking and recording of individual achievement and competency.

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<th>Major Benefit</th>
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</table>

Accurate tracking and recording of individual achievement and competency was considered a moderate to major benefit for a majority of respondents (15/20). However, it is noted more than half the number of small enterprises (5/8) considered this to be only moderate or no benefit to them.

**Q14** Will help with our Quality Management system for NZQA reporting and compliance.

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<th>Major Benefit</th>
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<td>Not a Benefit</td>
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<td>2</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

While a reasonable number of organisations believe e-learning would be beneficial in quality
management processes (8/20) half (10/20) consider this to be at best a minor benefit and a smaller number (6/20) do not perceive any benefits to quality management from the introduction of e-learning.

**Case Studies**

6.3 During the interviews with senior managers three prompts were used to elicit responses on the delivery of e-learning activities by their organisation:

i. *What are the main expectations for your ITO in using e-Learning?*

ii. *In your opinion what are the main added-value components of e-learning for your ITO?*

iii. *What, in your opinion, would you consider are the strengths of e-learning in the context of vocational education and training?*

The responses from senior managers are highlighted below.

Organisation X believed the potential of e-learning systems for their organisation would be focused on *assessments* and specifically *on the assessment on the job*. The organisation saw a critical role e-learning could play was in the provision of *support and specific resources* ... for on –the-job assessment to assessors.

To organisation X the *strengths of e-learning technologies are manifest in those people who work with ICT as part of their employment* these would include *personnel in offices, the corporate sector and financial positions*. Organisation X believed *in these situations e-learning can offer support material for assessments*.

Currently most assessment of competency of trainees is *through an ‘on– the– job’ or workplace log book* and is therefore paper based. Organisation X believes this “*assessment of competencies is an area where this ITO could*
employ e-learning technologies'.

To organisation X a crucial element for introducing e-learning was engagement of learners as this was important in providing added value to students. They had developed a range of services online for trainees. In essence, the online presence makes it easy to quickly and conveniently access your training information. By simply logging on to the … web-space … you can find out all about your training progress online. As well as trainees assessors can access relevant information on trainees plus support documents and assessment protocols.

Organisation X saw benefits in workplace assessment online which is probably a lot fairer, takes out some of the ‘on the ground’ variation … and had … advantages in terms of moderation.

Organisation Y was very positive on the potential offered by information and communication technology rich learning environments and believed there is so much opportunity to use e-learning. It adds value and improves the learning experience.

As well as benefits of using ICT tools in administrative activities the strengths of e-learning were in areas like connectedness, how trainees are able to engage in the learning, as well as the benefit of time and place.

Organisation Y had a positive attitude to e-learning systems and their expectation was the introduction of e-learning applications would provide better access to our stakeholders through the technologies and would provide a better service to our stakeholders; a better learning experience and a more achievable customer focused learning experience.

Organisation Y also anticipated there would be some economies of scale and efficiencies which we believe the technology will provide.

Organisation Y was convinced e-learning would lead to better learning results, flexibility, less costs per learner … it would also deliver … administrative efficiencies and (I) think we have covered this elsewhere. To them as a result of using the technologies computer literacy is increased.

Organisation Z believed e-learning, as well as bringing an increase in the level of engagement, would also provide some efficiencies as the organisation would be able to do assessment administration on line.
streamlining the current process.

Organisation Z believed flexibility being the most important and providing the main advantage in the use of e-learning technologies as an alternative/augmenting delivery approach support existing methodologies. Less costs through dissemination of resources through the electronic dimension.

Organisation Z also anticipated some potential cost benefits generated through collaboration on e-learning activities and the ITO is considering collaborating with and developing initiatives with other ITOs with similar functions.

While organisation Z recognised e-learning could potentially remove barriers to learning and definitely can be used to support training and it can also reduce cost.

6.4 Summary of Key Findings

➤ The literature indicates the smart use of ICT in vocational education and industry training provided a number of benefits. These can be classified under the general headings of just-in-time, consistency and quality, return on investment, time to market, health and safety and access.

➤ Organisations in New Zealand perceived the introduction of e-learning would provide trainees and organisations with increased flexibility. Respondents felt they would be able to deliver training at the right time (flexibility in time), design and deliver materials to suit the trainees pace (flexibility of pace), in a location of the trainees choice (flexibility of place) to a number of trainees simultaneously (flexibility of delivery).

➤ Organisations, generally across all levels, agreed the introduction of e-learning would meet employer and trainees needs as well as improving the ICT and technological literacy level of all participants.

➤ The introduction e-learning systems could provide a robust and engaging solution for ITO assessment processes. It will enable them to be more responsive to trainees’ needs and questions and be more supportive of “on-the-job” assessors.
Although organisations in general did not regard e-learning as contributing to its obligations to NZQA on reporting and compliance, there was recognition the implementation of e-learning systems would reduce firstly, administrative costs as processes became streamlined and secondly, save time during the assessment process.
Section 7: Critical Factors Influencing the Introduction of e-learning Initiatives

Selected Literature

7.1 Some of the articles and reports describing e-learning implementations, sustaining e-learning initiatives and evaluation of the impact these initiatives have in the vocational and industry training sectors are often anecdotal narrative accounts. The data is not always strong and on occasion findings are somewhat lacking in describing a theoretical approach. There is a paucity of fully-researched accounts into how to effectively to implement e-learning in the vocational and industry training sectors in New Zealand. This section will provide a framework of strategies, processes and procedures organisations could review and use to guide them in the introduction of this emerging approach to work-place and work-based learning.


In the introduction of online learning in the Queensland mining industry it was found six factors influenced the development and implementation of e-learning:

1) **External influences**: Staff employed in the mining industry are mobile; they work in shifts, underground and above ground and across a large number of sites. Given the mandatory nature of some of the training required it was felt online learning would standardise procedures and practices improving quality and meet external mandatory requirements.

2) **Organisational culture**: Often a management focus is the "bottom line" and online learning can be seen to be cost effective.

3) **Organisational structures**: Identifying champions within the organisation to promote the incorporation of online learning in strategic planning is important. The technological architecture, the provision of computers at locations above and underground also need to be addressed at a strategic planning level.

4) **Training environment**: Collaboration with external online learning experts in the development of material and/or the delivery of training is beneficial.

5) **Learners’ needs**: An adequate level of computer literacy is critical; workers need to be confident and competent to engage in online learning.
6) **Online learning environment:** Online training programs need to be easy to access and navigate, with minimal potential for user frustration: they need to work.

They concluded the process of implementation depends on the specific idiosyncrasies of each organisation within these main factors. It needs to be purpose built rather than formula driven, and responsive to needs. Viewed as a change process for organisations, it needs to involve all stakeholder groups, in designing a training environment that can integrate online learning with workplace learning. The learners also need support and resource material needs to be interactive and facilitated.

Table 5: BEST PRACTICES SUMMARY

<table>
<thead>
<tr>
<th>Learning Strategy</th>
<th>Organisation and Process</th>
<th>Learning Content</th>
<th>Learning Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Use eLearning to address the learning challenges of a distributed workforce.</td>
<td>• Create a centralized learning and development team. Source content both centrally and locally.</td>
<td>• Develop a mix of off-the-shelf content and custom content to match the business situation.</td>
<td>• Rationalize learning-infrastructure investments by taking a centralized approach.</td>
</tr>
<tr>
<td>• Use eLearning and related techniques to create learning programs for customers and resellers.</td>
<td>• Create standards and benchmarks for eLearning content.</td>
<td>• Create integrated learning programs including online and classroom activities.</td>
<td>• Create a learning architecture.</td>
</tr>
<tr>
<td>• Use eLearning to improve synergies between internal and external participants in complex business processes and projects.</td>
<td>• Share internal and external best practices with all teams active in developing, commissioning, or implementing learning.</td>
<td>• Supplement formal courses with informal learning activities.</td>
<td>• Integrate learning-management systems (LMS) with other enterprise systems.</td>
</tr>
<tr>
<td>• Provide eLearning to the sales department for fast, measurable, business impact.</td>
<td>• Negotiate risk-sharing deals for off-the-shelf content libraries.</td>
<td>• Combine basic with just-in-time learning.</td>
<td>• Consider LMS from enterprise-application vendors.</td>
</tr>
<tr>
<td>• Fulfill compliance-training requirements cheaply and efficiently using eLearning.</td>
<td>• Represent learning early during new strategic initiatives.</td>
<td>• Take a learning-objects approach.</td>
<td>• Develop infrastructure to enable greater multiluse of digital content for formal and informal learning activities.</td>
</tr>
<tr>
<td>• Use eLearning to provide on-demand learning for call-center operatives.</td>
<td>• Gain support from senior management.</td>
<td>• Design all content with reusability in mind.</td>
<td>• Incorporate learning into employee portals.</td>
</tr>
<tr>
<td>• Use eLearning to improve time to return on investment during new corporate cost-cutting initiatives.</td>
<td>• Find ways to win over middle and line managers.</td>
<td>• Use easy-to-use development tools to create low-cost custom content in-house.</td>
<td>• Be careful of political and technical issues when scaling up a local LMS for the enterprise.</td>
</tr>
<tr>
<td>• Tie learning to performance.</td>
<td>• Foster a good partnership between the training department and information technology.</td>
<td>• Create a &quot;knowledge assembly line&quot; of high-impact presentations by subject-matter experts.</td>
<td>• Consider custom LMS systems for low-cost tactical solutions.</td>
</tr>
<tr>
<td>• Assess learning outsourcing options.</td>
<td>• Create meaningful learning objectives.</td>
<td>• Migrate from physical to virtual classrooms to extend reach and reduce cost.</td>
<td>• Treat LMS systems for business partners like consumer Web sites.</td>
</tr>
<tr>
<td></td>
<td>• Invest in change management and ongoing user support during a move from classroom learning to blended learning.</td>
<td>• Create content-selection practices that meet requirements for deployment speed.</td>
<td>• Evaluate academic alternatives to commercial eLearning tools.</td>
</tr>
<tr>
<td></td>
<td>• Create incentives for informal learning and knowledge sharing.</td>
<td>• Obtain mass-customized content from generic-content vendors.</td>
<td></td>
</tr>
</tbody>
</table>

Survey

7.2 Ten questions were created in the survey exploring the management practices and organisational policies, procedures and plans relating to e-learning. The responses to these questions are detailed below.

**Q1 The educational value of introducing e-learning into training activities offered on behalf of the ITO has been carefully considered by senior management.**

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Strongly agree</td>
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<td>0</td>
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</tr>
</tbody>
</table>

The majority of respondents (14/22) indicated their organisation had undertaken a review on the educational value of introducing e-learning. It is of some concern a significant minority (8/22), and specifically small enterprises (5/10), have not critically reviewed the educational benefits of using ICT tools in the delivery of training.

**Q2 The business value of introducing e-learning into training activities offered on behalf of the ITO has been carefully considered by senior management**

<table>
<thead>
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<td>Strongly agree</td>
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</tbody>
</table>

A slight majority of respondents (12/22) indicated their organisation had undertaken a review on the business value of introducing e-learning. Concern could be over a significant minority (10/22), and specifically small (5/10) and medium (3/6) enterprises, have not critically reviewed the impact the introduction of ICT tools on their business planning.
**Q3** After considering its business and educational value senior management is fully supportive of the introduction of e-learning as part of business as usual for the organisation.

<table>
<thead>
<tr>
<th></th>
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<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
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</table>

Even though the majority of respondents (see 3.2.1 above) have reviewed the impact of e-learning on their organisation it is significant these reviews have yet to lead to positive support of this mode from senior management in small (6/9) and medium (4/6) enterprises. It would appear that only in large enterprises (5/6) senior management is actively pursuing e-learning initiatives.

**Q4** e-learning is regarded as a significant component of our organizations’ strategic planning for the future.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
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<th>Strongly agree</th>
</tr>
</thead>
<tbody>
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<td>4</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Though the majority of respondents (see 3.2.2 above) reviewed the business value of e-learning, it is significant these reviews have not led to the incorporation of e-learning in organisational strategic planning in small enterprises (7/10). It is only in medium (3/6) and large (4/6) enterprises that e-learning appears to part of the future planning of the organisation.
Q5 A formal e-learning policy is included in our annual strategic plan.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
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<td>0</td>
<td>0</td>
</tr>
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<td>Large</td>
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<td>n=6</td>
<td>n=22</td>
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</tr>
</tbody>
</table>

Although a majority of organisations have indicated e-learning could be a significant component of their planning for the future (see 3.2.3 and 3.2.4 above) this is not formalised in their planning documents (19/23). Only 3 organisations, small organisations (2/6) and large organisations (1/6), indicate formal e-learning plans have been developed.

Q6 Unit, section or departmental plans clearly reflect the importance of e-learning in the ITO plans for the future.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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<td>8</td>
<td></td>
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<td>Large</td>
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<td>1</td>
<td>3</td>
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<td>n=6</td>
<td>n=6</td>
<td>n=22</td>
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</tbody>
</table>

Since the majority of organisations have indicated there is no formal organisation wide e-learning plan for units to follow (see 3.2.5 above), it is not surprising unit and department plans do not contain detailed activities for the introduction of e-learning tools and technologies (18/23).
Q7 The ICT infrastructure / technologies needed to cope with increasing e-learning activities within the ITO have been identified.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
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</tr>
</tbody>
</table>

A majority (15/21) of the respondents indicate the technical infrastructure needed to be deployed to cope with the demands of e-learning activities has not been identified. Although the lack of technical planning is noted in all organisational types it is particularly apparent in the responses of medium sized enterprises (4/6).

Q8 The organisation’s budget has been structured to allow the long-term funding of e-learning initiatives.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
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</tbody>
</table>

A significant majority (18/21) of the respondents indicate the funding potentially required for the introduction of e-learning has not been allocated in organisational budgets. Although half the number of large organisations indicate allocations have been made (3/6) this is not the case in small (10/10) and medium sized (5/6) organisations.
**Q9** A dedicated senior managerial position has been created within the organisation to review e-learning initiatives undertaken by or on behalf of the ITO.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
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</tbody>
</table>

Given the noted lack of planning within organisations (see 3.2.5 above) it is not surprising managerial responsibilities for the introduction of e-learning have not been identified or formalised (15/23). This is most notable in small (7/10) and medium (5/6) sized organisations.

**Q10** e-learning initiatives and activities undertaken by or on behalf of the ITO are fully supported by a recognised e-learning team.

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<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
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<td>10</td>
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</tbody>
</table>

A notable majority (20/22) of the respondents indicate e-learning initiatives are not supported by a dedicated e-learning team. Given the lack of planning (see 3.2.5 above) and the lack of financial support in the form of budget allocation (see 3.2.8 above) this result is not surprising.
Case Studies

7.3 During the interviews with senior managers five prompts were used to elicit responses on the delivery of e-learning activities by their organisation:

i. Does your ITO have its own strategy and policies for the implementation of e-learning?

ii. What do you think are the critical organisational factors to ensure the culture and associated structure of your organisation support e-learning initiatives?

iii. Has your ITO allocated dedicated resources (physical, financial, human) for e-learning initiatives?

iv. What areas within your ITO would you consider are particularly appropriate for training via e-learning?

v. What sources of e-learning content are being used, or are being considered, by your ITO?

The responses from senior managers are highlighted below.

In organisation X e-learning is strategically recognised. However, the development of organisational policies was still in development and … will be developed by … the CEO and the Research and Development area over time.

Organisation X was conscious a full knowledge of e-learning, understanding how systems (such as LMS etc) and the pedagogy work and why they should use e-learning was critical to the successful implementation of e-learning within the organisation.

Organisation X had not yet allocated any of the resources necessary for the introduction of e-learning in their ITO and preferred not to comment on this focus area.

Organisation X anticipated the initial benefits of introducing e-learning would be more apparent in the corporate area that lends itself to e-learning/training along with some aspects of other sectors. On the other hand, those sectors with strong practical aspects are not considered to be appropriate for e-learning initiatives.
To organisation X the provision of content was not of direct concern to them. While the ITO makes sure providers assess appropriately and also provide accreditation where delivery is considered in keeping with the ITO mandate and education/training requirements, saw they had a moderation role, they did not believe they had the authority to tell providers how they deliver the training or insist they use e-learning.

Organisation Y was not too keen on strategies! Don’t see the point of pages and pages on strategies and what you are going to do. Previous experience in the development of policies would indicate that they don’t allow flexibility. The ITO is more likely to develop a comprehensive action plan (on one page) which will see the required outcomes achieved with a specific timeframe. What are we going to do, when and how much will it cost? Essentially a project plan.

Critically, organisation Y believed number one is buy-in and support from senior management. Others take their cue from the top. There was a need for the ITO to identify champions with key people in key roles/personnel within the organisation. The ITO need to take ownership, it is too easy to do outsourcing, which doesn’t always mean everyone will understand and be behind the developments.

Organisation Y was in the planning stage of allocating resources with more details forthcoming but thought to be more than adequate.

Organisation Y was in the process of advertising a new position that was seen to be an example of how resources for e-learning were being allocated.

Organisation Y also believed communication across many distributed sites could be improved dramatically and they felt e-learning increased responsiveness. It’s quick to turn around mistakes when using an electronic system; with 800 workplaces in an e-learning world we can be far more responsive.

Organisation Y believed the ITO challenge is to get to them all and the infrastructure is not yet available to all. E-learning can provide that infrastructure. Maybe discussion forums on line for the more remote groups and there are lots of them (remote groups).

Although organisation Y saw many benefits in e-learning systems the creation of content is at the moment low level. We produced some multimedia CD’s.
which have been used. Could probably call them ‘interactive story books’ with assessment.

To Organisation Y the next logical step is to create some interactive online resources which are the same as the paper based assessment. Users can choose to do the assessment online. This online component would mean administration and record keeping would be improved as results will be stored and compared with right answers. Because the ITO is responsible for moderation it can get a lot of information from the online assessment. Eventually everyone will do his or her assessment online.

Organisation Z did not have a current e-learning strategy but the organisation was aware an e-learning strategy is essential as at least some sort of roadmap to define where the ITO should be going forward ... the ITO ... shouldn't have a fragmented approach. There is a lot of hype around e-learning so there needs to be a clear direction and focus which is non-fragmented and reflects the learner experience. The ITO must have ownership of any strategy.

To organisation Z any e-learning strategy would be based around the learning needs of the trainees and others and some form of collaboration with other ... similar ITOs ... was seen as important in developing an appropriate strategy which supports the e-learning across the sector.

They believed e-learning can only go so far in meeting learning needs of our trainees and asked the question is it always appropriate in different situations? They were clear that blended learning is what the ITO supports.

Organisation Z was following a relatively cautious approach and apart from the budget associated with the pilot study (currently being undertaken) the adequate funding for e-learning implementation was not committed as yet.

As organisation Z began the process of introducing e-learning it will be a staged approach beginning with the non-technical areas and those areas that have access to computing facilities. To them this means mainly front line areas such as those involved with administration or in higher-level training such as that for professional development of front line staff and practitioners. At this stage the introduction of e-learning won't necessarily be associated with specific Unit Standards or up-skilling and developing competency of trainees in these particular areas.
Although organisation Z had not developed content specifically for trainees they had created a number of CDs and DVDs which … … are primarily for use by the trainers to demonstrate and teach various procedures and activities and as such are training resources. Trainees don't have access to any of this material.

7.4 Summary of Key Findings

- The literature identifies a number of critical success factors for e-learning in vocational education and training. These can be classified under the general headings of leadership, support structures, strategic alignment, communication, project management, change managements and pedagogical development.

- Currently ITOs have limited operational experience in the deployment and implementation of e-learning systems, applications and content. Therefore, discussions on e-learning tend to occur at a theoretical rather than practical level and organisational expectations around the impact of e-learning have yet to be fully articulated.

- The data collected during phase two indicated a significant majority of ITOs are actively reviewing the business and educational value of the introduction of e-learning within their organisations and currently using e-learning technologies, albeit in an elementary way, as a tool for trainee development.

- From the data generated in phase three of the project it appears senior managers in ITOs have a positive perception of the potential benefits of e-learning, are aware of the strategic importance of e-learning for future activities and are fully supportive of e-learning initiatives within their organisations.

- It is significant these reviews and this support have yet to be manifest in the incorporation of e-learning in organisational planning. There are few, if any, formal strategic plans, policies or organisational procedures for the implementation of e-learning within ITOs. Only a small number of large and medium ITOs had developed forward plans to include e-learning and even fewer have an e-learning policy included in their annual strategic plan.

- Given the notable absence of forward planning documents and e-learning policies it is not surprising specific communicative, managerial and
pedagogical roles and responsibilities have not been identified, defined or formalised. The level of funding required for e-learning developments has not yet been identified or allocated.
Section 8: Barriers to the Introduction of e-Learning for Industry and Vocational Training

Selected Literature

8.1 There is a distinct lack of publications and research reviewing the use of ICT and e-learning tools in New Zealand ITOs. However, there are a number of publications from international organisations of a similar nature to the New Zealand ITOs (particularly from Australia, Canada and the UK) which highlight the benefits of e-learning in vocational education and training. The publications identified below can be considered useful as benchmarks and guides to inform e-learning initiatives in New Zealand ITOs.


This article reports on a large-scale (n = 2,504), exploratory factor analysis that determined the underlying constructs that comprise barriers to distance education. The ten factors found were (1) administrative structure, (2) organisational change, (3) technical expertise, (4) social interaction and quality, (5) faculty compensation and time, (6) threat of technology, (7) legal issues, (8) evaluation/effectiveness, (9) access, and (10) student-support services.


The author identifies five barriers to the introduction of e-learning by an organisation; the first is financial. The costs involved in the deployment of the required technical infrastructure may be beyond the reach of small enterprises. However, organisations can reduce these costs by ‘renting’ e-learning space from commercial providers. Although courses may have an online presence this does not guarantee participants have the resources, both physical (for example bandwidth) and mental (for example, preferred learning style), to be able to participate fully in the activities. The author also notes there is the issue of time, firstly, in terms of creation of materials in digital formats and secondly, in structuring and sequencing these materials in a meaningful
way in a Web-space. The author is clear there needs to be an ongoing commitment by the senior management to provide the necessary physical, fiscal and human resources needed to ensure e-learning initiatives are successful.


This study discussed the results of the evaluation of a national research project ‘Net and multimedia based learning in graphic industries’ (NEMLIG) in Norway. Theoretically, the project referenced the ideas of cognitive apprenticeship (ref: Wang and Bonk, 2001), practice communities, and socio-cultural development of expertise. Operationally, it was agreed a prototype should be developed to provide the learner with the necessary support in his/her work when he/she so required, and that this should be provided in the proper doses. The intent was to create a tool supporting communication between masters and apprentices and build easily on these experiences. The solution created was referred to as a "learning arena" as distinguished from an e-learning programme.

Although the learners were positive about their experiences in the “Learning Arena” participants went “through the curriculum” and opted to read and print out resources. They also expressed an opinion they wanted to be assessed on this content and the skills acquired during the course. They did not use the extensive communication tools available to them, in fact learners acted in a “school like manner”.

A review of the project illuminates a number of critical points to help guide the development of work-based learning. These are:

1. **Work organisation:** The training was scheduled after the end of the working day. This impacted firstly, on the amount of time participants were going to make available to complete the course and secondly, on the amount of trust and mutual interest they shared with other participants.

2. **User Interface:** The user interface for the project was independently created on a net-based platform. This independent creation that did not take into account the software configurations and access rights of participating companies, meaning a number of crucial interactive tools could not be deployed for all participants. In cases where the full suite of tools was deployed the technological literacy costs of operating the tools successfully was too high for many participants.

3. **System Development:** The project was initiated by an external agency, a trade union, and the participating companies did not have the required operational
structures, such as technical architecture and line management structure, in place to meet the demands of the project.

The article concludes by asserting the problems encountered here will help future developments of net-based learning environments.


The findings from this report reveal that e-learning barriers are heterogeneous encompassing seven types of barriers, namely: (1) personal or dispositional, (2) learning style (3) instructional, (4) situational, (5) organizational, (6) content suitability, and (7) technological barriers. Situational barriers are the most prevalent while personal barriers were the least common. Four key factors emerged from the research which were seen as significant predictors of e-learning barriers, namely: (1) organisation, (2) self-efficacy, (3) computer competence, and (4) computer training. In summing up, the author is clear that successful e-learning demands social, cognitive, and behavioral skills for it to be effective. What determines whether an e-learning programme is successful or not are the interconnectedness between personnel, behaviour patterns and the environment in which the learning occurs. These are areas that would benefit from increased attention and support.

**Survey**

8.2 A number of questions were created in the survey exploring the nature of the current ICT infrastructure within the ITO and associated technical and learning support systems. Questions also addressed issues associated with costs, skill levels, managerial support of e-learning initiatives, knowledge of e-learning, content creation and resistance to change.
Q1 The current technology infrastructure deployed within the organisation.

A majority of respondents felt the lack of appropriate technical infrastructure could be a moderate to major barrier in the introduction of e-learning in their organisation (16/22). It is significant, small (8/9) and medium (5/7) organisations, viewed this as a greater barrier than large (3/6) organisations.

Q 2 The provision of ongoing technical and learning support for participants with limited IT skills.

The provision of ongoing technical and learning support for participants with limited IT skills was perceived as moderate to major issue for a substantial majority of respondents (19/21). Only two respondents one each from medium and large organisations considered the provision of support as a minor barrier.
**Q 3 Gaining support and commitment from senior and middle management.**

<table>
<thead>
<tr>
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<th>Moderate</th>
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<th>Minor</th>
<th>2</th>
<th>Not a Barrier</th>
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</tr>
</thead>
<tbody>
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<td>2</td>
<td>0</td>
<td>2</td>
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<td>4</td>
</tr>
</tbody>
</table>

While almost half the respondents believe gaining the support of senior managers would not be a barrier to the introduction of e-learning (9/21), a similar number (8/21) believe gaining support from management would be a moderate barrier. However, it is notable no respondent saw gaining the support of senior managers to be a significant or major barrier.

**Q 4 The costs (time, financial and human) of e-learning implementation.**

<table>
<thead>
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<th>4</th>
</tr>
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<td>Not a Barrier</td>
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</tr>
</tbody>
</table>

A substantial majority of respondents (18/21) regarded the costs associated with e-learning implementation would be a moderate to significant barrier. It is notable all of the small organisations (8/8) regard costs as a significant or major barrier. While large organisations (6/6) consider costs to be a moderate to minor barrier.
**Q 5** The organisation being able to source (access) educationally designed, organisation-specific and engaging content.

<table>
<thead>
<tr>
<th>Major Barrier</th>
<th>Significant</th>
<th>Moderate</th>
<th>Minor</th>
<th>Not a Barrier</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Large</td>
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<tr>
<td>Total</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

A substantial majority of respondents found the ability to source appropriate content as a moderate to major barrier (17/21).

Small organisations (5/8) regarded this issue as a significant or major barrier while large organisations (4/6) did not rate this barrier as highly.

**Q 6** Resistance to change from those familiar and comfortable with traditional learning and teaching approaches.

<table>
<thead>
<tr>
<th>Major Barrier</th>
<th>Significant</th>
<th>Moderate</th>
<th>Minor</th>
<th>Not a Barrier</th>
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<tbody>
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<td>n=8</td>
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<td>Large</td>
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<tr>
<td>Total</td>
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<td>0</td>
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<td>2</td>
</tr>
</tbody>
</table>

A substantial majority of respondents did not regard staff resistance to change as being a barrier to the implementation of e-learning in their organisation (17/21). However, it is notable half the number of small organisations consider this issue to be a significant or major problem (4/8).
**Q 7** Lack of basic ICT skills in our industry.

A majority of respondents perceived the lack of ICT skills within their industry sector would be a moderate to major barrier in the uptake of e-learning (16/21).

It is useful to note half of the small organisations regarded this as a significant to major barrier (4/8). While large organisations (5/6) consider this to be a moderate to minor barrier.

---

**Q 8** Motivating our particular learners to complete e-learning courses.

A majority of respondents perceived motivating students to complete courses independently could be a major barrier to e-learning acceptance (16/21). This was particularly true of small organisations where a majority regarded this as a significant barrier (5/8).
**Q 9 Organisational lack of knowledge on how to plan for the implementation of e-learning.**

<table>
<thead>
<tr>
<th>Major Barrier</th>
<th>Significant</th>
<th>Moderate</th>
<th>Minor</th>
<th>Not a Barrier</th>
</tr>
</thead>
<tbody>
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<tr>
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<tr>
<td>Not a Barrier</td>
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</tbody>
</table>

A majority of respondents perceived the organisational lack of knowledge on e-learning could be a moderate to significant barrier to e-learning implementation (16/21). This is most notable in smaller organisations where a majority (5/8) consider lack of organisational knowledge as a significant barrier.

**Q 10 The costs (time, financial and human) of maintaining e-learning activities in the organisation.**

<table>
<thead>
<tr>
<th>Major Barrier</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>n=8</td>
<td>n=7</td>
<td>n=6</td>
<td>n=21</td>
</tr>
<tr>
<td>Significant</td>
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<td>4</td>
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<tr>
<td>Moderate</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Minor</td>
<td>0</td>
<td>3</td>
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<td>6</td>
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<tr>
<td>Not a Barrier</td>
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<td>4</td>
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</tbody>
</table>

A significant majority of respondents (17/21) perceived the costs of maintaining e-learning initiatives to be a moderate to major barrier. It is significant small organisations consider costs to be a significant to major barrier (7/8). Large organisations (5/6) consider this to be only a moderate to minor barrier.
Case Studies

8.3 During the interviews with senior managers two prompts were used to elicit responses on the delivery of e-learning activities by their organisation:

i Do you think there are important pre-requisites (technological literacy, bandwidth) for the use of e-learning tools within your ITO systems?

ii What, in your opinion, would you consider weaknesses of e-learning in the context of vocational education?

The responses from senior managers are highlighted below.

Organisation X believed both the technical infrastructure and the technical literacy levels of its trainees were critical factors to address with the introduction of e-learning. They hoped that the literacy level in all sectors will be raised over time and this would ensure technical literacy would not be a significant barrier in the future.

The issues preventing the wider use of e-learning technologies within organisation X are mainly related to practical issues such as accessibility to computing equipment and the availability of broadband services and computing literacy. Although phones may become useful for certain activities in the future the fact is out in the field computing facilities are not common and this was considered a significant barrier.

A critical issue impacting on the introduction of e-learning at organisation X was the organisation’s clear understanding that it is not allowed to actually provide direct training for trainees. ITOs have a support and advisory role and as such ... X ... is not involved directly with e-learning technologies in the delivery of education and training. Therefore it was believed the direct management and introduction of e-learning activities were out of our hands.

Organisation Y recognised ITO will need the capacity within its system to build the ‘back office’ to support what you are trying to do and improve its infrastructure so it can meet the needs of trainees ... by ... building the back office first before you go out with something new. This attention to the infrastructural requirements would ensure the smooth introduction of e-learning activities.

Organisation Y has recognised the need to do some work on where we need to be and to forward this strategic planning a new position is to be advertised
shortly and part of that person’s role will be directly involved with the development of e-learning initiatives.

Although organisation Y was positive about the benefits of introducing e-learning a major concern for them is around authentication of assessment and the validity of the assessment model being online. Currently they are operating at levels 1-4 on the framework, this is the vocational level and although multi-choice questions, suited to e-learning delivery, are acceptable currently because it is work-based learning the authentication issues are minimised because the verification occurs in the workplace alongside the assessed activity.

Organisation Z was conscious the introduction of e-learning should be part of the overall ITO strategy. There was a need for the process to be managed carefully from the start, to have the ‘building blocks’ in place before proceeding. One of the potential solutions was maybe get a Moodle site, but this needs to integrate with infrastructure such as student records.

Organisation Z, as well as being conscious of the need for learners to be exposed to technology and technology learning, was also aware of their learner capability to use the technology is significant. These initiatives would help in creating a culture and environment to support technology based training.

As with organisation X a critical issue impacting on the introduction of e-learning was organisation Z’s clear understanding the ITO can’t be involved in the direct training of its trainees. The ITO is a standards setting body and actual delivery to trainees is not an option. Although they were conscious the quality of training is important and this is considered when doing accreditation of providers. We leave the delivery up to the provider.

This limited use of e-learning technologies by organisation Z was partially based on access to e-learning resources being an issue but more critically on the opinion e-learning is confusing. It’s a means of disseminating knowledge, there isn’t a clear definition of e-learning and this lack of a concise definition made it difficult to decide if e-learning met actual learning needs associated with Unit Standards.
8.4 Summary of Key Findings

- The literature indicates there are potentially a number of barriers preventing the successful introduction of e-learning in ITOs. These can be classified under the general headings of existing administration processes, change management, technical literacy, technical infrastructure, quality of the learning experience, costs and legal issues.

- Organisations are conscious increased e-learning activities will place a strain both on the technical infrastructure the organisation has currently deployed and the support policies, procedures and mechanisms they have in place to deal with student needs in an e-learning environment.

- It appears organisations are conscious the costs (time, financial and human) associated with the implementation and maintenance of e-learning approaches could be a major barrier to organisational adoption.

- While respondents were confident e-learning initiatives would receive the ongoing support from staff and senior management, they recognised organisational lack of knowledge on the best practice in e-learning implementation could be a significant barrier to success.

- The apparent limited technological literacy of trainees coupled with the need to implement unfamiliar ICT based communication strategies to motivate students to complete courses appears to be a major barrier to trainee acceptance of e-learning environments.

- It appears small to medium sized organisations with limited resources, capacity and capability to create organisational specific content, perceived the ability to access appropriate digital material a significant barrier to e-learning delivery.

- Organisations, across all types, appear confident their staff either have, or can easily acquire through a range of readily available professional development opportunities, the appropriate skills to effectively monitor e-activities, e-delivery and e-content creation.

- Organisations, across all types, do not appear confident about the level of technological literacy of their trainees. There is some concern trainees may not have the skills to participate fully in e-learning activities. This concern is
heightened by the perceived lack of appropriate and timely technical and learning support available to their trainees.
Section 9: Emerging and Mobile Technologies and ITOs

Selected Literature

9.1 The number of New Zealand publications, presentations, reports and research reviewing the use of mobile technologies in New Zealand is indicative of the growing awareness of the potential of mobile devices to be incorporated into industry and vocational training.


and


In these two papers, the authors present the outcome of trials at a Polytechnic which involved setting up a system to support workplace learning. In the first instance, the system involved the use of mobile technologies, specifically cell phones and text messaging. The text messaging was used to disseminate summative and formative assessments.

Mobile phones were also used to capture evidence of workplace skills, using various file formats, e.g. audio, video, photos and text. The resulting data was then used to create a personal e-portfolio which acted as a record of assessment of the workplace competencies and skill acquisition.


This paper explains some of the reasons Christchurch Polytechnic Institute of Technology (CPIT) are developing the use of m-learning with a view to providing support and course content to apprentices whose learning and training occurs mainly in the workplace. Mobile phones were chosen as the technology of choice and this is related to the ubiquitous nature of the technology. Pedagogical implications are discussed in the context of the mobile learning experience for bakery apprentices and the impact of modern technological advances.
StudyTXT is a mobile phone based short message service (SMS) using a ‘pull’ system. Mobile phones were chosen as the mobile learning devices for the study, as it was perceived the majority of students participating in the course had access to them. In essence the process involves students “ordering” text messages from a central database. They receive a txt response to their query and they are able to store, review and share them. Apart from the txt messages other file formats such as video and audio files are also being produced for courses. In this scenario files can downloaded and transferred to mobile phones via Bluetooth or USB.


This report was commissioned by the Ministry of Education and Ministry of Research, Science and Technology and is based on the author’s experience of e- and m-learning, interviews with education and industry providers, internet searches and a literature review. The paper provides some background information on the rapid changes and uptake of ICT over the past few years, the impact of the adoption of these technologies in education, scenarios for m-learning involving the use of devices such as phones, pocket PCs and wearable digital devices and investigates three key trends in the use of mobile technologies, i.e. Mobile Internet, Geo location and convergence. The report indicates m-learning ideally suits the conceptions underpinning ‘blended learning’ and case studies involving blended learning approaches and m-learning attributes are described. The report argues m-learning should be regarded as a sub-section of flexible learning / e-learning and not an independent learning concept.
The author clearly states that wireless mobile computing facilitates the development of collaborative learning communities, enhancing student-student and student-tutor communication and interaction. The author proposes that using wireless mobile devices in conjunction with open-source social software tools can potentially provide the basis for enhancing teaching and learning in virtually any discipline. This could include any or all of the training programmes offered under the umbrella of the ITOs.

This is a superlative New Zealand resource that is constantly updated to reflect and comment on existing and emerging technologies in the mobile domain which can be used in education and specifically e-learning; it is a ‘living’ document.

It provides a brief description of what Mobile learning is and places the concept in the context of social constructivism. It identifies the technologies involved and the pedagogy behind the mobile learning process along with specific examples of good practice.

In summary, it identifies the advantages of wireless computing in education as ubiquity, portability, and flexibility for collaborative learning projects.

Survey

9.2 Fourteen questions were developed in the survey exploring the awareness and use of m-learning tools and techniques in industry and vocational education. Supplementary questions on the future use of m-learning technologies by ITOs were also included. The responses to these questions are detailed below.
**Q1 M-learning will be a significant component of industry training in the future.**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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</thead>
<tbody>
<tr>
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<td>15</td>
<td>21</td>
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</tbody>
</table>

- **Strongly Disagree**: 1
- **Disagree**: 1
- **Undecided**: 5
- **Agree**: 2
- **Strongly agree**: 0

Given m-learning is still in its infancy it is not surprising the majority of respondents’ (12/21) are not yet decided on the role m-learning will or could play in industry training in the future.

Although a small number (3/21) of organisations do not foresee a role for m-learning in the future. A reasonable number (6/21) perceived m-learning would play an increasingly important role.

**Q 2 M-learning will demand a new attitude to learning on the part of learners.**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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</thead>
<tbody>
<tr>
<td>Small</td>
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<tr>
<td>Large</td>
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<tr>
<td>Total</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

- **Strongly Disagree**: 0
- **Disagree**: 1
- **Undecided**: 4
- **Agree**: 2
- **Strongly agree**: 1

A majority of respondents (12/20) agreed the introduction of m-learning would change the way participants viewed learning.

This view was generally shared by all organisational types, large (3/5), medium (4/6), and small (5/9).
Q 3 M-learning will demand a new attitude to teaching for people involved in training and development.

| Strongly Disagree | 0 0 0 0 |
| Disagree          | 0 0 0 0 |
| Undecided         | 4 1 1 6 |
| Agree             | 3 4 3 10 |
| Strongly agree    | 2 1 1 4 |

A majority of respondents (14/20) were of the view that introduction of m-learning would change the way teachers’ viewed teaching.

This view was generally shared by all organisational types, large (4/5), medium (5/6), and small (5/9).

Q 4 M-learning will be most effective when it is combined with other teaching methods.

| Strongly Disagree | 0 0 0 0 |
| Disagree          | 0 0 0 0 |
| Undecided         | 2 1 0 3 |
| Agree             | 3 4 4 11 |
| Strongly agree    | 4 1 1 6 |

A substantial majority of respondents (17/20) perceive a “blended” approach, incorporating m-learning technologies with other teaching methods, is the most effective way of using these emerging technologies.

This view was generally shared by all organisational types, large (5/5) medium (5/6) and small (7/9).
Q 5 The educational value of introducing m-learning into training activities has not been fully researched.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
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</table>

A slight majority of the respondents (11/20) are conscious insufficient research has been conducted into monitoring the educational value of m-learning in industry and vocational learning and training. This view was most notable in small (6/9) and medium (4/6) organisations.

Q 6 The business value of introducing m-learning into training activities has not been fully reported.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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</table>

A majority of the respondents (14/20) are conscious insufficient research has been conducted into monitoring the business value of introducing m-learning in industry. This is most notable in small organisations (7/9) although a significant majority in large (3/5) and medium (4/6) organisations are also conscious of the lack of investigation in this area.
**Q 7** The current generation of m-learning technologies do not fully exploit the potential of m-learning.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
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<td>10</td>
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</tbody>
</table>

Given the relatively new phenomenon of m-learning it is not surprising a majority (12/20) are not aware of the current and future developments in mobile technologies and m-learning. However, it is significant small organisations (5/9) are potentially more aware of these developments than other organisational types.

**Q 8** M-learning techniques and technologies will meet trainee demands for greater flexibility in industry training.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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<td>12</td>
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</tbody>
</table>

Although the majority of respondents (12/20) are undecided on the ability of m-learning techniques to meet the demands for greater flexibility. A reasonable number (8/20) of respondents felt the use of mobile technologies and techniques would increase flexibility of training for students.
**Q 9** M-learning techniques will help motivate more of our trainees to complete training.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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<tr>
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</table>

The majority of respondents (12/20) were undecided on the ability of m-learning techniques to improve student motivation. However, a number of respondents (6/20) felt the use of mobile technologies would increase student motivation. Interestingly no respondent disagreed with the statement.

**Q 10** The ubiquitous nature of mobile phones makes them an ideal m-learning tool.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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</tbody>
</table>

While almost half of respondents (9/20) were undecided on mobile phones being an ideal learning tool, only slightly fewer respondents (7/20) believed mobile phones were an ideal m-learning tool.
**Q 11** M-learning methodologies will change the way we deliver learning resources to our trainees.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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Given the relatively new phenomenon of m-learning it is not surprising a majority of respondents (14/20) are unaware of how resources can be shared using a range of mobile techniques and technologies. However, it is notable no respondent disagreed with the concept the sharing of resources would be altered.

<table>
<thead>
<tr>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=9</td>
<td>n=6</td>
<td>n=5</td>
<td>n=20</td>
</tr>
</tbody>
</table>

**Q 12** M-learning methodologies will change the way we communicate with our trainees.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

While half the number of respondents (10/20) were undecided on how mobile technologies would alter the way they communicated with trainees, almost the same number (9/20) indicate mobile technologies would change the way communication with trainees was likely to occur.

<table>
<thead>
<tr>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=9</td>
<td>n=6</td>
<td>n=5</td>
<td>n=20</td>
</tr>
</tbody>
</table>

76
Q 13 M-learning and the utilisation of mobile phones will reduce the digital divide.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Half the number of respondents (10/20) perceived the use of m-learning and mobile phones would help reduce the digital divide.

However, slightly less (8/20) were undecided on this issue.

Q 14 M-learning and the utilisation of mobile phones will minimise the need for student access to computers.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>3</td>
<td>5</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

A majority of respondents (14/20) were undecided on the impact mobile phones would have on the use of computers.

However, there were a number of respondents (5/20) who saw the possible potential of mobile phones replacing the computer.
**Q 15** Estimated proportion of the trainees participating in m-learning activities in the next 12 months.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Less than 25%</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>26% - 50%</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>51% - 75%</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Over 76%</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

From the responses it is clear 50% of trainees involved with ITOs will not be exposed to any m-learning experiences in the next 12 months (11/22).

Of those organisations who are considering offering an m-learning experience (9/20), this will only be offered to a small fraction (less than 25%) of their trainees.

**Q 16** Do you consider that the adoption of m-learning approaches by your organisation in the next 2 years will

<table>
<thead>
<tr>
<th>Change in Adoption</th>
<th>Large Increase</th>
<th>Slow Increase</th>
<th>Remain the Same</th>
<th>Decrease Slowly</th>
<th>Large Decrease</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Medium</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>11</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Large</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>17</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

A significant majority of respondents (16/22) from large (6/6) medium (5/7) and small (5/9) organisations indicated a slow and steady increase in the use of m-learning technologies in ITOs in the next 12 months. It should be noted a minor number of small (4/9) and medium sized enterprises (2/7) are not anticipating a change in m-learning adoption.
Q 17 Do you consider that the adoption of m-learning approaches by your organisation in the next 5 years will

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Increase</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Slow Increase</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Remain the Same</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Decrease Slowly</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Large Decrease</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not Applicable</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

A significant majority of respondents (16/22) from large (6/6) medium (6/7) and small (5/9) organisations indicated a slow and steady increase in the use of m-learning technologies in ITOs in the next 3-5 years. It should be noted a number of small (4/9) and medium sized enterprises (1/7) are not anticipating a change in m-learning adoption.

9.4 Summary of Key Findings

- Given the relatively new phenomenon of m-learning it is not surprising organisational knowledge of m-learning technologies, concepts and potential is limited.

- Organisations are conscious the lack of published and readily available research on the business and educational value of m-learning could hamper the introduction of m-learning techniques and technologies in their organisation.

- Mobile learning (m-learning) should not be regarded as a distinct mode to be used as an alternative to, or replacement of, e-learning or flexible learning activities. It should be regarded as a sub-section of flexible learning / e-learning and be incorporated in strategic planning of the organisation.

- The development of a "blended learning" strategy, for example integrating the use of mobile devices with the e-learning applications such as e-portfolios or using text messages to prompt or re-enforce student learning, has been recommended in a number of reports.

- In the survey respondents considered m-learning as a learning and teaching tool and not an independent learning concept. Therefore, respondents believed a
“blended approach”, where the m-learning tools are used in conjunction with other teaching and learning modes, is a viable option.

- The development of gaming on mobile devices and the creation of ‘bite-size’ readily downloadable multi-media rich content could increase the use of m-learning technologies in teaching and learning at all levels.

- Currently m-learning methods, techniques and technologies are used sparingly by organisations. However, from the responses it is clear a substantial number of organisations are conscious of the value of m-learning and are anticipating within the next 1 to 5 years there will be a steady but significant increase of m-learning activities in their organisation.

- As with e-learning, careful planning involving a clearly articulated organisational policy on the need for and use of m-learning technologies along with a strategy for the introduction, implementation, ongoing development and support, is critical if the process of introducing m-learning within an organisation is to succeed.
Section 10: Evaluation of e-learning Capability.

10.1 Significantly there are a number of New Zealand publications, funded by the Tertiary e-Learning Research Fund (TeLRF) reviewing the e-Learning capability and maturity of organisations. The publications, identified below, can be considered as useful benchmarks and guides to inform how e-learning initiatives in New Zealand ITOs can be evaluated.

Selected Literature


The E-Learning Maturity Model (eMM) acknowledged that a significant challenge organisations will face in the introduction of e-learning is containing the cost of e-learning implementation while maximising the training outcomes for participants. In short, an organisation needs to ensure investments in e-learning design, development and deployment are meeting the needs of the learners, trainers and the organisation. The eMM is partially based on the software engineering process maturity models first proposed in the early 1990s. It is focused on the concept that organisations need explicitly to understand what they are doing and why they are doing it. By working through the levels of eMM an organisation, through defined and managed processes, better understands what it is doing and where to focus resources to improve and refine successful developments. This detailed understanding of organisational aspects of e-learning will allow institutions incrementally to improve their overall e-learning capability.

The E-Learning Maturity Model recognises that evaluation of an organisation’s capability in an intricate field such as e-learning is a complex undertaking. As large amounts of detail are reduced to produce broad overviews, subtle nuances and innovative practices of individuals motivating teaching staff to work on specific projects could be lost. The focus of the eMM is aimed at changing organisational conditions so that e-learning is delivered in a sustainable and high quality fashion to as many students as possible.
This study involved a range of approaches to determine whether staff development for e-learning in place at six institutions helped staff develop their capability and confidence to utilise new technologies for teaching. Surveys, interviews and two case studies provided the data from which the findings were drawn. Major findings which identified the need for adequate time and support for staff to develop skills in e-learning, varied approaches to enable increasing capability plus some common barriers mirrored those of similar research projects in New Zealand and overseas. The authors also concluded that current formal staff development approaches for e-learning capability were not really adequate and only resulted in the acquisition of 'beginning competencies'.

The main group of learners involved with this project was females involved in care giving. The authors demonstrated that technical assistance was extremely important in supporting their e-learning. The technical support should be available over extended operating hours, as the care-givers clearly liked to work on their projects after normal hours.

In general most of the tertiary institutions surveyed were providing good student support. The research highlighted where the provision of student support could be improved and extended. This included the provision of a short course in e-learning for the students, improved access to information, skills in time management and the development of efficient communication systems with staff.

The report recommends a number of processes that providers should monitor and assess to ensure adequate provision of student e-learning support services which met the needs of the learner.

The following (slightly modified) diagram and notes are from the *Embedding Learning Technologies: Facilitator’s Guide* (a Joint Information Systems Committee (JISC) funded project). The diagram provides a general overview of the steps an institution will need to go through in carrying out an e-learning audit.

**The Process**

- **Plan audit design and methods**
  It is essential that you are clear about your aims, objectives and expectations before you begin the audit. It is also important that you consider the most appropriate methods to suit your situation and to fulfil the aims and objectives you have identified.

- **Identify issues and stakeholders**
  Once you've decided how you are going to carry out the audit, you will need to identify key institutional issues and contact key stakeholders to involve them in the process. This is especially the case if you intend to run one or more focus groups.

- **Do detailed preparation**
  You will need to ensure that you have gathered relevant resources, planned focus groups and other information gathering exercises with care and allowed sufficient time in your plan for analysing the data and disseminating the findings.

- **Carry out the institutional audit**
  Follow the detailed notes as you work through each of the audit tools. These provide a wealth of help and support for each element of the audit tools.

- **Analyse outcomes**
  It is essential that you allow plenty of time to analyse the data you gather in order to be able to really benefit from the audit. The Audit Notes give very precise guidance on how to interpret scores but focus group data must also be analysed.

- **Review and action planning**
  Once the data is thoroughly analysed you will need to develop a plan to translate outcomes into action. This should also include disseminating findings, reviewing the process and planning any further comparative study.
Tony Bates has been recognised for many years for his experienced advice on the effective and efficient use of technologies in learning and teaching. In this chapter of the book he summarises the results of a study of 'seven best practice institutions'. He points out a clear difference between the institutional approaches to the development of instructional design skills by staff. In the best practice institutions this is a multidisciplinary approach; staff from different disciplines work together to create high quality effective solutions. In other institutions, staff are more often than not expected to develop the skills themselves. What needs to be recognised is the real challenge of change that occurs when technology is introduced to the teaching and learning environment. In order for the change to be successful it needs the support of the management and an understanding of the limitations and benefits of teaching and learning with technology. All staff need adequate support to enable them to embrace the change. In essence the author feels that moving an institution to adopting the use of learning technologies is more about human change than technical decisions and hence requires a long-term strategy.

**Survey**

**10.2** Twelve questions were developed in the survey exploring the current capabilities of ITO in the deployment of e-learning. The responses to these questions are detailed below.

*Q1 The introduction of e-learning technologies in organisations.*
A majority of ITOs are actively reviewing the introduction of e-learning within their organisations. There was a recognition e-learning was best used tactically to meet specific training needs and e-learning approaches should be integrated with other teaching modes.

**Q2** e-Learning approaches are being used to support effective pedagogy.

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A blended learning approach incorporating both face-to-face activities with e-learning technologies</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Mentoring of the trainee</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Authentic (work-based) practical exercises are offered</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Trainees contribute to the development of teaching materials</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Authentic competency assessment regimes are developed</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>The application of relevant theory to the individual trainees workplace</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>Action research to identify best practice is undertaken</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>e-learning activities are not offered by our ITO</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>13</td>
</tr>
</tbody>
</table>

It appears a majority of organisations are not actively involved in e-learning approaches to support pedagogy. When they are a “blended” approach was a preferred option.

**Q3** This organisation regularly exchanges information with other ITOs on the best use of e-learning in vocational education and training.
A majority of the respondents (13/21) clearly indicated there was limited regular sharing of information between ITOs on e-learning best practice. This lack of collaboration was most notable in small (7/10) and medium (4/6) sized organisations.

Organisational views of staff e-learning competencies are mixed with some organisations confident of competency (7/23) and others less confident (6/23). It appears large (3/6) and medium (3/6) sized organisations have more confidence in the abilities staff to critically review e-learning activities offered. Smaller organisations (3/9), appear less confident.

Just under half the number of
organisations (10/21), in particularly large organisations (5/6), are confident appropriate professional development related to the concepts and principles of instructional design is available to staff. However, small organisations (5/9), are conscious of the limited availability of this type of professional development.

Q6 Staff employed in the creation / purchase of e-learning training activities can access professional development on effective teaching and learning in e-learning environments.

Almost half of organisations (10/21), in particularly large (5/6) and medium (3/6), are confident professional development related to the concepts of teaching and learning in e-environments is available to staff. However, a number of small organisations (3/9) are conscious of the limited availability of this type of professional development.

Q7 Potential changes to the organisational structure generated by the introduction of e-learning have been identified.

Less than half the number of organisations (8/20), in particular large enterprises (3/6), indicated they
are conscious of the potential changes e-learning may bring to their organisational structure. However, a number of large (2/6) medium (3/6) and small (3/8) organisations have not considered how e-learning will impact on their structures.

**Q8** Any potential changes to current roles and responsibilities generated by the introduction of e-learning have been communicated to staff.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Disagree</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>12</td>
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</tr>
<tr>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>n=8</td>
<td>n=6</td>
<td>n=6</td>
<td>n=20</td>
<td></td>
</tr>
</tbody>
</table>

Since a limited number of organisations are conscious of the full impact of e-learning on their existing organisational structure (see 3.3.5 above) it is not surprising a majority of organisations (12/20) indicate staff have not been informed on how e-learning will impact on their roles and responsibilities.

**Q9** The trainees with training agreements with this ITO have the required ICT skills to engage in e-learning activities offered by or on behalf of the ITO.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Undecided</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>n=8</td>
<td>n=6</td>
<td>n=6</td>
<td>n=20</td>
<td></td>
</tr>
</tbody>
</table>

It appears a majority of ITOs are unaware of the information literacy skills of their students (11/20 undecided). A number (5/20) believe their trainees do not have the
required ICT skills, almost an equal number (4/20) are confident their trainees have the skills to participate in e-learning activities.

**Q10** The trainees with training agreements with this ITO have access to online learning support to enable them to participate fully in e-learning activities.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

While a number of organisations believe their trainees have adequate online support to complete e-learning activities (5/20), a larger number (7/20) believe there is inadequate online support. In particular medium sized enterprises (4/6) are most concerned about the amount of online learning support available to their trainees.

**Q11** The value of introducing e-learning into training activities offered by or on behalf of the ITO has been clearly communicated to all stakeholders.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
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</thead>
<tbody>
<tr>
<td>Small</td>
<td>0</td>
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<td>0</td>
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<td></td>
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<tr>
<td>Medium</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td></td>
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<tr>
<td>Large</td>
<td>5</td>
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<td>6</td>
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<tr>
<td>Total</td>
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</table>

A majority of enterprises (12/20), in particular medium sized enterprises (6/6), do not appear to have had full and open discussions with their stakeholders of the value of
introducing e-learning into training activities.

**Q12** The ITO consults regularly with all stake-holders on the best use of e-learning in the organisation.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Undecided</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Disagree</td>
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<td>0</td>
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<td>4</td>
<td></td>
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<tr>
<td>Agree</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</table>

Half the organisations (10/20), in particular the medium sized (6/6), do not appear to have had discussions with their stakeholders regarding the best use of e-learning in their organisations. It is also significant small organisations (6/9) appear to be consulting more regularly on this issue than other organisations.
Case Studies

10.3 During the interviews with senior managers’ one prompt was used to elicit responses on the delivery of e-learning activities by their organisation:

i.  *Do you think there are important pre-requisites (technological literacy, bandwidth) for the use of e-learning tools within your ITO systems?*

The responses from senior managers are highlighted below.

Organisation X believed both the technical infrastructure and the technical literacy levels of its trainees were critical factors to address with the introduction of e-learning. They *hoped that the literacy level in all sectors will be raised over time* and this would ensure technical literacy would *not be a significant barrier in the future*.

Organisation X had a *very good technology infrastructure within the ITO*. *With access to broadband and a good student management system.*

Organisation X also had a web site to store *online resources for assessment*. From this web-site *assessors can … … get files on assessment* and although there … *is no e-learning for assessors as yet …* this could … *potentially change (if) when an LMS is employed*

Organisation X believed that while access *to broadband for trainees was good in the corporate sector, other sectors are very variable*. They were conscious some of their trainees *out in the field were not normally equipped with ICT* and this could be *an issue in the future.*

Organisation Y recognised *ITO will need the capacity within its system to build the 'back office' to support what you are trying to do and improve its infrastructure so it can meet the needs of trainees … by … building the back office first before you go out with something new.* This attention to the infrastructural requirements would ensure the smooth introduction of e-learning activities.

Organisation Y was keen to be *starting now* and e-learning activities *will be a staged implementation and will depend on resources available.*
Organisation Z was conscious the introduction of e-learning should be part of the overall ITO strategy. There was a need for the process to be managed carefully from the start, to have the ‘building blocks’ in place before proceeding. One of the potential solutions was maybe get a Moodle site, but this needs to integrate with infrastructure such as student records.

There was a need for the process to be managed carefully from the start, to have the ‘building blocks’ in place before proceeding. One of the potential solutions was maybe get a Moodle site, but this needs to integrate with infrastructure such as student records.

Organisation Z, as well as being conscious of the need for learners to be exposed to technology and technology learning, was also aware of their learner capability to use the technology is significant. These initiatives would help in creating a culture and environment to support technology based training.

10.4 Summary of Key Findings

Since e-learning activities and systems are not being used extensively by a majority of ITOs. ICT and e-learning tools have in general had a limited impact on vocational trainees learning experiences and vocational trainers teaching experiences. Therefore, reviews monitoring the effect the introduction of e-learning has on tutors’ workload and studies evaluating the success of e-learning activities with trainees have not been undertaken.

It appears ITOs use of digital resources is based on a personal computer delivery format, such as CDs, DVDs and computer based resources, rather than on emerging Web technologies, such as Blogs and Wikis, or mobile display technologies, such as iPods and MP3 players. There is also an observable trend for ITOs to buy “off the shelf” or “outsource” the development of content. However, it also appears firms contracted have not followed, or have not been directed to follow, accessibility guidelines or content development standards.

Organisational views of staff e-learning competencies are mixed with some organisations confident of competency and others less confident. However, it appears large enterprises have more confidence in the abilities of staff to critically review e-learning activities offered than small and particularly medium sized organisations.
A majority of ITOs are unaware of the information literacy skills of their students. While a small number believe their trainees do not have the required ICT skills, almost an equally small number are confident their trainees have the skills to participate in e-learning activities.

A significant number of organisations, in particular large enterprises, have indicated they are conscious of the potential changes e-learning may bring to their organisational structure.
Section 11: Measuring e Learning Success

11.1 There is an emerging number of publications and reports reviewing organisational ability to measure the success of e-learning initiatives. The publications, identified below, can be considered as useful as benchmarks and guides to inform how e-learning initiatives in New Zealand ITOs can be evaluated from various perspectives.

Selected Literature


This publication identifies four quality assurance procedures for the development of e-learning initiatives. The procedures facilitate five distinct applications of e-learning, and the system combines flexibility with an effective design structure. The system further benefits from its clear step-by-step processes and self-correction through planned project reflection time. These procedures serve as a guide for those contemplating the development and implementation of e-learning initiatives.

Using technology doesn't always match well with traditional modes of teaching and learning. The authors believe that the quality assurance procedures when applied to the design, creation and implementation of e-learning solutions at various defined levels and which take into account current practice and institutional strategy, will ensure a quality outcome.


Firms praise online training as a cost-effective, convenient, and effective way to deliver corporate education. This paper provides an outline of five levels and associated approaches to evaluating e-learning in corporate training; it also reviews content quality measures. In order to utilise the five levels effectively, the author contends that there needs to be a more solid research methodology, as much of the current research is qualitative. Introducing systematic research will hopefully confirm that learners that are being taught online are actually acquiring and using the skills,
and that e-learning is the best way to achieve the outcomes in a corporate environment.


Benchmarking is based on the concept of comparison and measurement. A clear set of measurable indicators, (such as cost per learning hour, student's exit satisfaction scores, academic achievement, reliability and speed of connection) are used to measure the organisation’s performance against others in the same field. The results of the benchmarking process will help the organisation illuminate strengths and weaknesses in e-learning delivery. In essence, benchmarking helps organisations identify, understand and adapt best practice / high performance within their own organisation.

The Australian National Training Authority (ANTA) has identified 12 e-learning indicators to provide a baseline from which to measure the uptake of e-learning, illustrate trends and impact of e-learning on skills, employment and system service outcomes. It is envisaged that these indicators may also be adapted and used by individual education and training providers to establish their own organisational goals and benchmarks for e-learning.


This papers reviews the use of psychosocial learning environment measures in measuring e-learning success. It explains the essence of a learning environment is the interaction that occurs between individuals, groups and the setting within which they operate. The instruments are based on the Lewinian formula, B=f(P,E). This formula identifies that behavior (B) is considered to be a function of (f) the person (P) and the environment (E). This formula argues that 'both the environment and its interaction with personal characteristics of the individual are potent determinants of human behavior. Since the e-learning environment is a place where trainers and learners congregate for periods of time to participate in the activity of instruction, the environment created, also referred to as climate, atmosphere, tone, ethos or ambience, during this activity will be an important component in the learning process and should be measured.
All learners who participate in e-learning activities leave what can be described as an “electronic trail/log” of their learning activities. How an organisation stores, manipulates, interprets and analyses this trail/log of learner activities is the key to analytics. For example by noting the “mouse clicks” of users on the learning site organisations can aggregate data about the pages learners visited, in what order they were visited and how long learners remained on a particular task. For example, if a group of learners constantly choose a learning pathway bypassing a specific page of information, it indicates there is a learning issue, the information is redundant and can be removed from the system, or there is a technical issue, the associated links to the information are not enabled. By reviewing the electronic data generated by a learner’s “clicks”, trainers and tutors can improve the quality of overall learning experience.

**Survey**

11.2 A number questions were developed in the survey to review the current practices of ITOs in measuring the success of e-learning initiatives. The responses to these questions are detailed below.

**Q1 Evaluation procedures and/or policies used to review e-learning activities**

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<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>1. systematically gather and collate student feedback on their e-learning experience</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>2. take action on student feedback on their e-learning experience</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>3. monitor the impact of e-learning on student achievement</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. monitor the impact of e-learning on trainer workloads</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. systematically gather financial costs of e-learning delivery</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. ensure all e-learning products purchased / produced are regularly reviewed for quality, currency and relevance to the organisation</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>7. e-learning activities are not offered by our ITO</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>13</td>
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</table>

It appears organisations have a framework of policies and procedures in place to review student feedback, and regularly review the content provided for students. However, there does not appear to be processes in place to monitor the effectiveness of e-learning on student achievement.
Case Studies

11.3 During the interviews with senior managers one prompt, *have you developed any criteria to use for the evaluation of potential e-learning solutions*, was used to elicit responses on the delivery of e-learning activities by their organisation. The responses from senior managers are highlighted below.

**Organisation X** did not see a role for ITO in the provision or development of digital content as this *is done by the provider and is totally separate* from the organisation's core activities. Therefore, organisation X *doesn't do any e-learning* the monitoring of e-learning activities is *minimal*.

Organisation X believed they *could use an e-learning system to enable assessor to sign off trainee competence through an Learning Management System (LMS)* although *none of the LMS currently available are perfect*. Since the LMS *Moodle has an evaluation component built into it, Moodle is currently under consideration as the preferred LMS of this organisation*.

During this part of the interview organisation X reiterated they believed the ITO has many different bodies that they are responsible to so have to stick within their role. *Education/training [learning] for trainees is not part of their role*.

Given the current limited use of e-learning within organisation Y it is not surprising there are no fixed organisational policies in place to review the use of CD’s used. However, *the ITO responds to the feedback form on the survey of their use and is developing a much better product as a result*. For example *the original CD was deemed too complex and appropriate changes have been made*.

Organisation Y had also tried to *make sure the techies don’t do the evaluation of the product. They are part of the development but don’t necessarily see or understand the use of the product in context*.

Organisation Y was actively involved in *another research project with a University and as part of the project we are developing e-learning guidelines for ‘our world’ a model and appropriate e-learning framework for an ITO environment*. They were *anticipating by this time next year we should have*
our model.

Because organisation Z maintained limited e-learning activities the monitoring of e-learning activities was minimal. However, during the introduction of the organisation’s pilot programme, monitoring would come as the Pilot progresses ... and ... quality control of materials plus appropriate pedagogy around the resources would be part of the development process.

Organisation Z was carefully planning their approach to the introduction of e-learning applications and was currently undertaking a pilot to use e-learning tools for at least one Unit Standard. As the organisation monitored the pilot they would develop some criteria based on the feedback on the suitability of the approach.

To organisation Z the successful introduction of e-learning would depend on the employer facilitation of the process and the employee willingness and desire to use e-learning and outcomes can be achieved.

Like many other organisations organisation Z doesn't have anything online at present and, as with organisation X, this organisation believed the content production is left to outside providers ... to them ... the providers should develop the content and any training tools.

11.4 Summary of Key Findings

- In general the organisations did not consider they had a direct (hands on) role in the education and training of their trainees. This was the domain of the providers as was the development of appropriate digital content.

- Monitoring and contributing to the development of digital content in the future is likely to see increased involvement from the ITOs

- Evaluation and assessment were seen as two areas where e-learning technologies could be used, especially for online assessment regimes.
PART C: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Section 12: Summary

Section 13: Conclusions

Section 14: Recommendations

Section 24: Summary

12.1 Context

12.1.1 The Tertiary e-Learning Research Fund (TeLRF) was established with a view to funding research into tertiary e-learning in New Zealand. It was decided that the best use of the available financial resources was to fund e-learning research that would provide a more comprehensive context and framework to inform strategic investment and decision-making around e-learning for tertiary education organisations. In particular, research was required to identify the observable trends and drivers of change that are likely to have a significant impact on the future of vocational e-learning in New Zealand.

12.1.2 Given the overarching purpose of the TeLRF, consultation was undertaken with the Ministry of Education and external stakeholders to identify what the major knowledge needs were in regards to e-learning in the tertiary sector. One major identified need, supported by the Ministry’s own gap analysis, was to determine the answer to the question of ‘how effective e-learning has been in a vocational/workplace context both in terms of meeting learner/business needs and in increasing organisational productivity’.

12.1.3 The aim of the e-Learning activities in New Zealand Industry Training Organisations project was to produce a series of research reviews culminating in this final research report. These reports were designed to increase awareness in the ITO sector of the development and delivery of effective, cost efficient and educationally sound work-based and work-placed e-learning. The initial reports also sought to determine the actual level of use of e-learning technologies in education and training programmes supported by the individual ITOs.

12.1.4 This part of the final report has been structured to summarise the findings of the identified focus areas. These are:

- Benefits of e-learning for industry and vocational training
Critical factors influencing the introduction of e-learning initiatives

Barriers to the introduction of e-learning for industry and vocational training

Emerging and mobile technologies and ITOs

Evaluation of e-learning capability

Measuring e-learning success.

12.1.5 For the purpose of this report e-learning is described as learning that is enabled or supported by the smart use of information and communications technology (ICT).

12.2 Benefits of e-learning in Industry and Vocational Training

An International Perspective

12.2.1 The extensive review of the international literature undertaken in phase one of the project identified the introduction of e-learning in industry and vocational education had enabled the deployment of different types of instructional and learning activities from those reliant on previous traditional modes (e.g. short block-courses, face-to-face sessions, hands-on demonstrations), and traditional media (e.g. print, or audio visual).

12.2.2 The desire of individual governments (such as Australia, Canada and Great Britain) to raise the profile and use of Information and Communication Technologies (ICT) in the Vocational Education and Training (VET) and Industry Training sector is apparent in a number of commissioned reports, funded incubator projects and policy documents produced and reviewed in phase one of this project.

12.2.3 It was perceived the smart use of ICT in vocational education and industry training provided a number of benefits. These included:

➢ Just-in-Time: The smart use of ICT means learning and training can be delivered, on-site and off-site, to the right person at the right time in the right place. This reduces the period between undertaking the training and application of the knowledge or skills acquired.
Consistency and Quality: The material created and level of training delivered to employees, from session to session, from user to user, is consistent and uniform. In developing an e-learning course it is possible to utilise all the skills and knowledge of all trainers and subject matter experts in the development of high quality material.

Return on Investment: While e-learning development costs are high, delivery and maintenance costs are relatively low. Therefore, unlike other modes, the per-user costs for e-learning can potentially decrease each time the course is used.

Time to Market: Because e-learning activities can be sequenced, structured and distributed and accessed via the internet, the training required in the servicing of new initiatives or products can rapidly be deployed, updated and kept current.

Health and Safety: E-learning simulations allow trainees to safely master skills before applying them in actual, potentially-hazardous situations (such as using flight simulators to train pilots).

Flexible and Continued Access: The challenge of scheduling training and the financial costs of room hire, travel and accommodation are potentially reduced. E-learning allows participants to access and review the lessons they need at times convenient to their employers.

Quality Assurance and Compliance Management: E-learning can allow instant monitoring of the progress of employees in mandatory training. Such monitoring may be critical for areas where there may be legal implications, such as induction training and occupational health and safety training.

The ITO Experience

12.2.4 Despite an intensive search of available literature in books, journals, in educational digital databases and on the Internet, it is evident there is a paucity of publications on the subject of e-learning in industry and vocational organisations in New Zealand.

12.2.5 The widespread use of computers, e-mail, informational web-sites and the internet have become familiar applications in many ITOs and it appears the “time is
ripe" to build upon this current ICT infrastructure and begin further to develop e-learning activities in vocational training and educational activities.

12.2.6 From the data gathered during phase two and phase three of this research project it was apparent there was currently limited e-learning activity being undertaken by ITOs. However, the ITOs surveyed were conscious of the potential benefits of e-learning. These are listed below:

- Organisations perceived the introduction of e-learning would provide trainees and organisations with increased flexibility. Respondents felt they would be able to deliver training at the right time (flexibility in time), design and deliver materials to suit the trainees' pace (flexibility of pace), in a location of the trainees’ choice (flexibility of place) to a number of trainees simultaneously (flexibility of delivery).

- The reduction of costs of delivery, the time it takes for organisations to deliver training and the ability to attract new trainees to their programmes were not considered significant drivers for introduction of e-learning by the majority of organisations. However, for small organisations these three activities appeared to be critical and were considered to be an integral justification for introducing e-learning in their organisations.

- Organisations, generally across all levels, agreed the introduction of e-learning would meet employer and trainees’ needs as well as improving the ICT and technological literacy level of all participants.

- They are conscious e-learning functionality enables them firstly, to reduce administrative costs as processes became streamlined and secondly, to save time during the assessment process and thirdly, to be more flexible in their approach and responsiveness in their dealing with trainee queries.

- Although organisations in general did not regard e-learning as contributing to their obligations to NZQA on reporting and compliance, there was recognition the implementation of e-learning systems would firstly, reduce administrative costs as processes became streamlined and secondly, save time during the assessment process.
12.3. Critical factors influencing the introduction of e-learning initiatives

An International Perspective

12.3.1 The available literature describing e-learning implementations, sustaining e-learning initiatives and evaluation of the impact that these initiatives have in the vocational and industry training sectors are too often anecdotal narrative accounts, weak in confirmed data.

12.3.2 As there is a paucity of fully-researched accounts into how to effectively to implement e-learning in the vocational and industry training sectors, discussions on e-learning tend to occur at a theoretical rather than practical level. Therefore, this project found it useful to review the more abundant literature available on the introduction of e-learning in the tertiary/further educational sector.

12.3.3 Extrapolating from the literature available on the implementation of e-learning in the tertiary education sector it appears the key factors/indicators in the successful implementation and development of e-learning across and within industry could be classified into a number of generic areas. These are described below

- **Leadership:** It is clear ongoing support for the incorporation of e-learning within an organisation must be evident from the senior management team. This support should encompass physical, financial and human resource viewpoints.

- **Strategic Alignment:** Careful planning involving a clearly articulated organisational policy on the need for, and use of, e-learning technologies along with a clearly communicated strategy for the introduction, implementation and ongoing development and support, is critical if the whole process of introducing e-learning within an organisation is to succeed.

- **Communication:** The initial case for change must be communicated precisely with stakeholders. Regular communication with stakeholders, reporting on progress against measurable outcomes, must occur.

- **Project Management:** A small, well-led, full-time, balanced project team-including external expertise where necessary, following and reporting on a detailed project plan needs to take ownership of the project.
Final Report

➢ **Change Management:** Organisational cultural issues potentially affecting individuals'/team/sections’ willingness and ability to use the e-learning infrastructure are implemented, identified and addressed.

➢ **Pedagogical Development:** A pedagogical team, led by an e-learning champion with in-depth knowledge of e-learning, identifies and addresses issues in course selection and design, learning support, technical support, digital content design, assessment, quality of resources and appropriate use of digital tool functions.

**The ITO Experience**

12.3.4 Currently ITOs have limited operational experience in the deployment and implementation of e-learning systems, applications and content. Therefore, discussions on e-learning tend to occur at a theoretical rather than practical level and organisational expectations around the impact of e-learning have yet to be fully articulated.

12.3.4 The data collected during phase two indicated a significant majority of ITOs are actively reviewing the business and educational value of the introduction of e-learning within their organisations and currently using e-learning technologies, albeit in an elementary way, as a tool for trainee development.

12.3.5 From the data generated in phase three of the project it appears senior managers in ITOs have a positive perception of the potential benefits of e-learning, are aware of the strategic importance of e-learning for future activities and are fully supportive of e-learning initiatives within their organisations.

12.3.6 It is significant these reviews and this support have not yet led to the incorporation of e-learning in organisational planning and there are few, if any, formal strategic plans, policies or organisational procedures for the implementation of e-learning within ITOs. Only a small number of large and medium ITOs had developed forward plans to include e-learning and even fewer had an e-learning policy included in their annual strategic plan.

12.3.7 Given the notable lack of forwarded planning documents and e-learning policies it is not surprising specific communicative, managerial and pedagogical roles and responsibilities have not been identified, defined or formalised and the potential required funding for e-learning developments has not yet been identified or allocated.

An International Perspective

12.4.1 Traditional instructor-led training is still popular with many organisations and enterprises. It is a known factor, safe, predictable, and it has the advantage of the ‘personal touch’ where a good instructor can motivate learners, mentors and monitor progress. The introduction of e-learning brings with it unknown levels of complexity and new dependencies. In short, changes to the traditional classroom methods can create unease, uncertainty and instability for both instructors and learners.

12.4.2 At an organisational level the following barriers to implementation can be seen to exist:

- **Administration**: Managing e-learning initiatives through existing structures can be problematic. Enrolment, scheduling and fiscal issues generated by distributed location of students are different from those for face-to-face sessions.

- **Change Management**: Traditional practices are hard to modify and replace. Both tutors and learners, familiar with face-to-face teaching, comfortable within classroom instruction and training, will resist change.

- **Technical Literacy**: In the modern world it is difficult to keep abreast of all the technologies used in learning and teaching. Many instructors lack the knowledge and skills to design and teach e-learning courses and many learners lack the knowledge and skills to learn within this environment.

- **Technical Infrastructure**: Learners may not have the connectivity, hardware or appropriate software applications to participate fully in the training offered. Also the training provider may not have the appropriate systems in place to deliver e-learning activities.

- **Quality of Learning Experience**: In e-learning courses participants can feel isolated, missing the person-to-person contact (high-touch) aspects of the classroom. The computer facilitated engagement with activities (high-tech) and the focus on self-paced independent learning raises concerns about the quality of learning experience and the depth of understanding.
Legal Issues and security: The increasing use of information sourced through the Internet in the delivery of e-learning raises concerns about intellectual property rights such as copyright, fair use policies, piracy, and unauthorised access. Maintaining privacy of information can also be a concern.

Costs: The initial cost of developing and implementing e-learning systems within ITOs can create problems, especially for smaller organisations. Evidence is beginning to appear in research publications that indicates in the short term costs can be high but in the long term cost reduction is definitely achieved.

The ITO Experience

12.4.3 Organisations are conscious increased e-learning activities will place a strain both on the technical infrastructure the organisation has currently deployed and the support policies, procedures and mechanisms they have in place to deal with student needs in this e-environment. These factors were considered as major to moderate barriers to e-learning introduction.

12.4.4 It appears organisations are conscious the costs (time, financial and human) associated with the implementation and maintenance of e-learning approaches could be a major barrier to organisational adoption.

12.4.5 While respondents were confident e-learning initiatives would receive the ongoing support from staff and senior management, they recognised organisational lack of knowledge on the best practice in e-learning implementation could be a significant barrier to success.

12.4.6 The potential limited technological literacy of trainees coupled with the need to implement unfamiliar ICT based communication strategies to motivate students to complete courses could be a major barrier to trainee acceptance of e-learning environments.

12.4.7 It appears small to medium sized organisations with limited resources, capacity and capability to create organisational specific content perceived the ability to access appropriate digital material a significant barrier to e-learning delivery.

12.4.8 Organisations, across all types, appear confident their staff either have, or can easily acquire through a range of readily available professional development
opportunities, the appropriate skills to effectively monitor e-activities, e-delivery and e-content creation.

12.4.9 Organisations, across all types, do not appear confident about the level of technological literacy of their trainees. There is some concern trainees may not have the skills to participate fully in e-learning activities. This concern is heightened by the perceived lack of appropriate and timely technical and learning support available to their trainees.

12.5. Emerging and Mobile Technologies and ITOs

An International Perspective

12.5.1 The current state of e-learning is mostly geared towards computer users with a direct fixed line access to the internet. The emergence of a new wave of technologies, such as high bandwidth wireless channels and 3G-telecommunication infrastructures, is changing the learning landscape. The development of mobile devices and software applications is flourishing and these are changing how, when and where we communicate with each other and how, when and where we access information.

12.5.2 Mobile learning (m-learning) should not be regarded as a distinct method to be used as an alternative to, or replacement of, e-learning or flexible learning activities. It should be regarded as a sub-section of flexible learning / e-learning and be incorporated in strategic planning of the organisation.

12.5.3 Mobile devices have access to a range of communication, personal management, and information tools via wireless and telecommunication technologies. They also have access to a range of software applications such as multi-media editing, storage and manipulation tools and office applications. The devices include Personal Digital Assistants (PDA’s), iPod’s, (video, audio and text), MP3 players, USB storage devices, Pocket PC’s, Mobile Phones (with integrated personal organisation, management and communication systems), Miniature Game Consoles and wearable devices. As the devices become more sophisticated and reliable, increasingly educators are examining their potential for use in online courses and for communicating with their students.
12.5.4 In essence Mobile Learning (m-learning) refers to the use of electronic devices, generally small, portable and/or wearable, in formal and informal learning activities.

12.5.5 Social constructivism provides the theoretical base for the use of mobile devices in learning and teaching

The ITO Experience

12.5.6 Given the relatively new phenomenon of m-learning it is not surprising organisational knowledge of m-learning technologies, concepts and potential is limited within the ITO sector.

12.5.7 Organisations are conscious the lack of published and readily available research on the business and educational value of m-learning could hamper the introduction of m-learning applications, teaching strategies and technologies in their organisation.

12.5.8 In the survey respondents considered m-learning as a learning and teaching tool and not an independent learning concept. It should not be regarded as a distinct mode to be used as an alternative to, or replacement of, e-learning or flexible learning activities. Therefore, respondents believed a “blended approach”, where the m-learning tools are used in conjunction with other teaching and learning modes, is a viable option.

12.5.9 The development of a “blended learning” strategy, for example integrating the use of mobile devices with the e-learning applications such as e-portfolios or using text messages to prompt or reinforce student learning, has been recommended in a number of New Zealand based reports.

12.5.10 As with e-learning, careful planning involving a clearly articulated organisational policy on the need for, and use of, m-learning technologies along with a strategy for the introduction, implementation, ongoing development and support, is deemed critical if the process of introducing m-learning within an organisation is to succeed.

A New Zealand Perspective

12.6.1 The E-Learning Maturity Model (eMM) acknowledged that a significant challenge organisations will face in the introduction of e-learning is containing the cost of e-learning implementation while maximising the training outcomes for participants. In short, an organisation needs to ensure investments in e-learning design, development and deployment are meeting the needs of the learners, trainers and the organisation.

12.6.2 The eMM is partially based on the software engineering process maturity models first proposed in the early 1990s. It is focused on the concept that organisations need explicitly to understand what they are doing and why they are doing it. By working through the levels of eMM an organisation, through defined and managed processes, better understands what it is doing and where to focus resources to improve and refine successful developments. This detailed understanding of organisational aspects of e-learning will allow institutions incrementally to improve their overall e-learning capability.

12.6.3 The eMM divides the capability of institutions to sustain and deliver e-learning into five major categories or process areas.

- **Learning**: Processes that directly impact on pedagogical aspects of e-learning.
- **Development**: Processes surrounding the creation and maintenance of e-learning resources.
- **Support**: Processes surrounding the oversight and management of e-learning.
- **Evaluation**: Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle.
- **Organisation**: Processes associated with institutional planning and management.

12.6.4 The E-Learning Maturity Model recognises that evaluation of an organisation’s capability in an intricate field such as e-learning is a complex undertaking. As large.
amounts of detail are reduced to produce broad overviews, subtle nuances and
innovative practices of individuals motivating teaching staff to work on specific
projects could be lost. The focus of the eMM is aimed at changing organisational
conditions so that e-learning is delivered in a sustainable and high quality fashion to
as many students as possible.

The ITO Experience

12.6.5 Since e-learning activities and systems are not being used extensively by a
majority of ITOs, ICT and e-learning tools have, in general, had a limited impact on
vocational trainees learning experiences and vocational trainers teaching
experiences. Therefore, reviews monitoring the effect the introduction of e-learning
has on tutors’ workload and studies evaluating the success of e-learning activities
with trainees have not been undertaken.

12.6.6 It appears ITOs’ use of digital resources is primarily based on a personal
computer delivery format, such as CDs, DVDs and computer based resources, rather
than on emerging Web technologies, such as Blogs and Wikis, or mobile display
technologies, such as iPods and MP3 players. There is also an observable trend for
ITOs to buy “off the shelf” or “outsource” the development of content. However, it
also appears contracted providers have not followed, or have not been directed to
follow, accessibility guidelines or content development standards.

12.6.7 Organisational views of staff e-learning competencies are mixed with some
organisations confident of competency and others less confident. However, it
appears large enterprises have more confidence in the abilities of staff to critically
review e-learning activities offered than small and particularly medium sized
organisations.

12.6.8 A majority of ITOs are unaware of the information literacy skills of their
students. While a small number believe their trainees do not have the required ICT
skills, almost an equally small number are confident their trainees have the skills to
participate in e-learning activities.

12.6.9 A significant number of organisations, in particular the larger ones, have
indicated they are conscious of the potential changes e-learning may bring to their
organisational structure.
12.7. Measuring the Success of e-Learning

An International Perspective

12.7.1 Benchmarking is based on the concept of comparison and measurement. For example, the participant e-learning experience the organisation provides to its employees is compared both against participant e-learning experience provided by other training organisations, and by the learning experience of students at an educational institution.

12.7.2 A clear set of measurable indicators, (such as cost per learning hour, student’s exit satisfaction scores, academic achievement, reliability and speed of connection) can be used to measure the organisation’s performance against others in the same field. The results of the benchmarking process will help the organisation illuminate strengths and weaknesses in e-learning delivery. In essence, benchmarking helps organisations identify, understand and adapt best practice / high performance within their own organisation.

12.7.3 The Australian National Training Authority (ANTA) has identified 12 e-learning indicators to provide a baseline from which to measure the uptake of e-learning in the vocational education and training (VET) sector. The 12 indicators are:

- % of VET unit enrolments that use e-learning.
- % of VET providers offering units that use e-learning.
- % of VET learners who through e-learning have increased skills and confidence in using information and communication technology (ICT).
- % of VET learners who through e-learning have or expect to have improved employment outcomes.
- % of VET clients who believe e-learning and e-business gave them flexibility in when, where and how they engaged with VET.
- Client satisfaction with e-learning experiences in VET.
- % of VET providers offering e-business client, support and administrative services.
- % of VET clients using e-business client, support and administrative services offered by providers.
- Client satisfaction with e-business experiences in VET.
- % of VET teachers/trainers delivering units that use e-learning.
% of VET teachers/trainers who through e-learning have changed teaching practices in the design, development and delivery of units.
% of VET teachers/trainers who believe increased access to e-learning resources has improved teaching and learning outcomes.

The ITO Experience

12.7.4 Currently a significant majority of ITOs are still coming to terms with the concepts of e-learning and few organisations are actively engaged in e-learning activities such as creating online resources, delivering e-learning activities or evaluating the e-learning experiences of participants. Therefore, measuring the success of e-learning within organisations has not been undertaken.

12.7.5 A critical issue impacting on the introduction of e-learning to ITO trainees is the mandated support, monitoring and advisory role of the ITOs. Since ITOs are not the suppliers of training they are heavily dependent on the contracted “provider” for the incorporation of e-learning activities in course materials, development of learning support structures and evaluations. Therefore, indicators measuring the success of any e-learning initiatives have not been fully developed by ITOs.
Section 13: Conclusions

13.1 Overview

13.1.1 The following conclusions are drawn from an analysis of data relating to the various areas investigated during the research project. Conclusions are inevitably open to interpretation and discussion. Where possible they are objective and succinct. They provide a genuine and reasonable representation of the issues associated with the current use of e-learning technologies within New Zealand ITOs.

13.2 Communication and Dissemination

13.2.1 Despite an intensive search of available literature in books, journals, in educational digital databases and on the Internet, it is evident there is a paucity of publications on the subject of e-learning in industry and vocational organisations in New Zealand.

13.2.2 This lack of readily available research, case studies, technical solutions and exemplars on the business and educational value of e-learning could be seen to be impeding the introduction of e-learning techniques and technologies within and across organisations.

13.2.3 This could be addressed by the creation of a controlled access web-portals supplemented by traditional dissemination strategies such as symposia, workshops and conferences should also be considered.

13.3 Management and Planning

13.3.1 A critical issue impacting on the introduction of e-learning to ITO trainees is the mandated support, facilitation, monitoring and advisory role of the ITOs. The Industry Training Act (1992/55) indicates one of the roles of Industry Training Organisations is to ‘facilitate workplace learning for trainees in employment’. Although ITOs are not necessarily the "suppliers" of training they appear to be overly dependent on the contracted “provider” for the incorporation of e-learning technologies in course materials, the development of appropriate learning support structures and assessment and evaluation procedures.

13.3.2 While the mandated role may prohibit ITOs from day-to-day delivery this does not necessarily mean they cannot influence “providers” to incorporate e-learning
components in courses and programmes developed for their trainees. Organisations need to clearly indicate to providers the commitment of the ITO to implementing e-learning methodologies. The major aims being to improve the quality of materials presented, the responsiveness of the provider to trainee queries, and improve the overall quality of the learning experience of their trainees.

13.3.3 This can be achieved by the development and implementation of organisational specific e-learning templates and guides detailing, digital material creation checklists guided by global standards, minimum expectations on the use of ICT in the presentation of course materials, the communication of providers with trainees and the management of assessment activities, and minimum expectations on the provision of online technical advice and learning support for trainees.

13.4. Evaluating of e-Learning Capability

13.4.1 Currently ITOs have limited operational experience in the deployment and implementation of e-learning systems, applications and content. Therefore, discussions on e-learning tend to occur at a theoretical rather than practical level and organisational expectations around the impact of e-learning have yet to be fully articulated.

13.4.2 ITOs face a significant challenge in containing the cost of e-learning implementations, while maximising the training outcomes for trainees. In short, an organisation needs to ensure investments in e-learning design, development and deployment are meeting the needs of the learners, trainers and the organisation.

13.4.3 Organisations need to explicitly understand what they are doing, why they are doing and the costs involved. A New Zealand developed tool, currently used across the tertiary sector, is the E-Learning Maturity Model (eMM). By working through the levels of eMM an organisation, through defined and managed processes, better understands what it is doing and where to focus resources to improve and refine successful developments. This detailed understanding of organisational aspects of e-learning will allow institutions incrementally to improve their overall e-learning capability.
13.5 Measuring e-Learning Success

13.5.1 Benchmarking is based on the concept of comparison and measurement and to be successfully implemented needs to be based on a recognised set of measurable indicators.

13.5.2 The results of the benchmarking process will help individual organisations illuminate strengths and weaknesses in their own, or their providers, e-learning activities. While the tools such as the eMM described above provides organisations with much needed data to improve their e-learning capability and capacity the model does not necessarily provide the simple indicators measuring the success of e-learning across the ITO sector.

13.5.3 It would appear to be appropriate, in this context, for ITOs to identify common basic e-learning indicators that could be used by all ITOs to provide a baseline from which to measure the uptake of e-learning in the New Zealand.

13.6. Sustaining e-Learning Implementations

13.6.1 Senior managers and staff in ITOs do not appear to be fully aware of the necessary technological capability of staff to implement e-learning components in courses, the level of technological literacy needed by their trainees to fully participate in e-learning events or the appropriate technical capabilities of their providers to present appropriate e-learning content.

13.6.2 To ensure e-learning is not implemented in a haphazard, ad-hoc and fragmentary manner appropriate and timely professional development needs to be provided to senior managers and / or those responsible for e-learning activities. The professional development offered should include:

- Pedagogical strategies in e-learning;
- Supporting and motivating students in e-learning environments;
- Searching, storing and displaying digital materials and;
- Evaluations of e-Learning systems and applications.

13.6.3 While some professional development maybe able to be provided in short time constrained face-to-face workshops and symposia this may not be sufficient to sustain e-learning initiatives. To gain the valuable experiences of being an “online learner” it should be considered that professional development offered should be online.
13.7. Technical Considerations

13.7.1 Currently ITOs use of digital resources is primarily based on a personal computer delivery format, such as CDs, DVDs and computer based resources and ITO Web-sites are considered to be an important and useful tool for the ITO's to disseminate information to its stakeholders, customers, trainees, trainers and employers.

13.7.2 The widespread use of computers, e-mail, web-spaces and the internet appear to have become everyday applications in many ITOs. It appears the “time is ripe” to build upon this current ICT infrastructure and begin to further develop e-learning activities in vocational training and educational activities in a structured way.

13.7.4 The technical knowledge needed to create and deploy an ICT system addressing issues such as ease of navigation, provision of a range of synchronous and asynchronous tools to aide trainee-ITO communication, the provision of tools to present, store, and retrieve content and the ability to monitor, evaluate and administer the environment are complex issues. They are often beyond the skills and financial resources of many training organisations.

13.7.5 Many organisations in general seek an “out of the box” solution selecting and deploying well-proven ICT systems called learning management system (LMS), for example, Moodle, First Class and Blackboard.
Section 14: Recommendations

14.1 The following recommendations are drawn from an analysis of the conclusions presented in the previous section. The project team is conscious these recommendations are inevitably open to debate. The team also recognises the size and nature of each individual ITO influences their approach to the introduction of ICT and e-learning tools for their trainees and a “one size fits all” approach may not reflect the diverse needs of individual ITOs. Therefore these recommendations should be regarded as potential guidelines for the implementation of e-learning in ITOs. They should not be regarded as mandated action points applicable to all ITOs. However, the team believes they provide a reasonable overview of how ITOs may address the issues associated with implementation of e-learning technologies.

14.2 Recommendation 1: It is recommended a consortium of ITOs, led by the Industry Training Federation:

   a. identify what successful implementation of e-learning means to ITOs,
   b. consider the creation of a demonstrator Web-portal where case-studies, templates and guidelines of best practice in e-learning implementations can be made available to inform senior managers across the ITO sector
   c. facilitate focused and time constrained seminars and discussions, using a full range of synchronous and asynchronous tools once the portal established
   d. encourage ITO staff to facilitate workshops and present case studies demonstrating and focused on e-learning in ITOs at regional and national events organised by the sector.

14.3 Recommendation 2: It is recommended individual ITOs create organisational specific e-learning templates, standards and procedures to guide providers in the creation of courses for the ITO detailing minimum expectations on the:

   a. digital material created for the ITO;
   b. use of ICT in the presentation of course materials;
   c. effective communication between providers and trainees;
   d. management of trainee assessment activities;
   e. provision of on and off-line technical advice and learning support for trainees.
14.4 Recommendation 3: It is recommended all ITOs participate in organisational capability reviews based on the eMM framework and focused on:

a. the review and assessment of current ITO e-learning capability;

b. the creation of organisational-specific strategic and action plans based on these reviews and;

c. the development of a targeted investment approach by ITOs to supporting e-learning implementation.

14.5 Recommendation 4: It is recommended a consortium of ITOs:

a. using the information provided in the literature review identify a limited number of simple baseline indicators to measure e-learning uptake;

b. review and select an appropriate ICT system to facilitate the collection and comparison of data generated by the use of the indicators developed;

c. use the data to inform future development and incorporation of e-learning technologies in the ITO e-learning activities.

14.6 Recommendation 5: It is recommended a consortium of ITOs:

a. review the availability of generic e-learning professional development offered by New Zealand tertiary providers and identifies appropriate courses and programmes to meet ITO needs;

b. negotiate with identified providers the provision of courses for the ITO sector.

c. encourage ITO staff to complete e-learning courses, participate in workshops and attended conferences focused on e-learning at regional and national events;

d. provide adequate professional development time to enable staff to upskill;

e. provide opportunities to apply new skills.
14.7 Recommendation 6: It is recommended a consortium of ITOs collaborate with providers to:

a. review the e-learning system needs of ITOs and create a check list of desired ICT function and;

b. use the check list as a guide by individual ITOs in the selection of LMS suitable for their trainees.
15. REFERENCES


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## 16. APPENDICES

### 16.1 Appendix 1: Glossary of Key Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asynchronous</td>
<td>Asynchronous communication is interaction that occurs in nominal time.</td>
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<tr>
<td>Blended Learning</td>
<td>An approach to e-learning that involves the learner in a mixture of face-to-face and online learning experiences.</td>
</tr>
<tr>
<td>Blogs</td>
<td>Blogs are information and commentary sites set up by individuals or special interest groups to share ideas and information.</td>
</tr>
<tr>
<td>Bluetooth</td>
<td>An industrial specification for wireless personal area networks (PANs). Bluetooth provides a way to connect and exchange information wirelessly between mobile devices.</td>
</tr>
<tr>
<td>Chat-room</td>
<td>This is a web-tool to allow people to “chat” textually in real time.</td>
</tr>
<tr>
<td>Computer-Based Training</td>
<td>An electronic self-paced learning activity. Media-Rich content and learning activities are generally stored on a CD-Rom, DVD or memory stick.</td>
</tr>
<tr>
<td>Competency Based Training</td>
<td>Competency-based training is an approach to vocational education and training that places emphasis on what a person can do in the workplace as a result of completing a program of training.</td>
</tr>
<tr>
<td>Digital Learning Objects</td>
<td>Electronic 'stand-alone' information and learning packages which can be combined to provide a variety of learning opportunities. The learning objects may be as simple as some pages of text or as sophisticated as a virtual tour of a museum.</td>
</tr>
<tr>
<td>Discussion boards</td>
<td>Asynchronous communication tools and can be compared with interactive notice boards.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
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<tr>
<td>Distance learning</td>
<td>Education in which the majority of the instruction occurs when student and instructor are not in the same place. Distance education may employ correspondence study and/or audio, video, or computer technologies.</td>
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<tr>
<td>Distributed learning</td>
<td>A student-centred approach to learning that incorporates the use of technology in the learning process.</td>
</tr>
<tr>
<td>e-learning</td>
<td>Learning that is enabled or supported by the smart use of information and communications technology (ICT).</td>
</tr>
<tr>
<td>Flexible learning</td>
<td>The provision of a range of learning modes or methods, giving learners greater choice of when, where and how they learn.</td>
</tr>
<tr>
<td>Instructional design</td>
<td>The systematic process of translating principles of learning and instruction into plans for instructional materials and activities.</td>
</tr>
<tr>
<td>Learning Management System (LMS)</td>
<td>A software application or Web-based technology used to plan, implement, and assess a specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance.</td>
</tr>
<tr>
<td>m-learning</td>
<td>In essence Mobile Learning (m-learning) refers to the use of electronic devices, generally small, hand-held, portable and wearable, in formal and informal learning activities.</td>
</tr>
<tr>
<td>Multimedia</td>
<td>Seamless integration of text, sound and images within a single information environment.</td>
</tr>
<tr>
<td>Off-line support</td>
<td>Support which uses conventional systems of communication with users of digital online materials and resources. This could include telephone, fax, letters or personal support systems.</td>
</tr>
<tr>
<td>Online learning</td>
<td>Learning occurring where education and training are delivered and supported by networks such as the internet or intranets. Learners are able to learn at any time and any place.</td>
</tr>
<tr>
<td>SCORM</td>
<td>A collection of specifications that enable interoperability, accessibility and reusability of web-based learning content.</td>
</tr>
<tr>
<td>‘Smart’</td>
<td>Intelligent use of Information and Communication Technologies</td>
</tr>
<tr>
<td><strong>Stakeholder</strong></td>
<td>Any organisation, group or individual with an interest in an enterprise.</td>
</tr>
<tr>
<td><strong>Streaming media</strong></td>
<td>This is a technical term for digital audio or video transmissions via the Internet. Each user receives his or her 'stream' of data. Sometimes referred to as unicast.</td>
</tr>
<tr>
<td><strong>Synchronous</strong></td>
<td>Synchronous communication is interaction and communication that occurs in real time.</td>
</tr>
<tr>
<td><strong>VoIP</strong></td>
<td>Voice over IP. Using the Internet to conduct telephone calls, telephone meetings or video conferencing.</td>
</tr>
<tr>
<td><strong>Web-Based Training (WBT)</strong></td>
<td>Self-paced learning activity using the infrastructure of an intranet or the Internet. Media-Rich content and learning activities are generally accessed through a web browser.</td>
</tr>
<tr>
<td><strong>Web-folios</strong></td>
<td>These are student portfolios on the World Wide Web. Web-folios are created to assess student learning by integrating information and communication technology with portfolios.</td>
</tr>
<tr>
<td><strong>Web-portal</strong></td>
<td>Provides a 'gateway' to a range of resources and material related to a specific discipline or organisation. In addition facilities such as synchronous and asynchronous managed forums, email and discussion groups, are provided to enable communication and interaction between authenticated users.</td>
</tr>
<tr>
<td><strong>Web-tools</strong></td>
<td>Applications that function as Web based resources. These include chat, e-mail, forums, instant messaging, VoIP for virtual discussions) digital content creation tools such as Wikis, Blogs and Web-folios</td>
</tr>
<tr>
<td><strong>Web-space</strong></td>
<td>Provides access to a range of materials and resources that are specific to a particular discipline or organisation.</td>
</tr>
<tr>
<td><strong>Wireless technology</strong></td>
<td>Wireless technology is just what the name implies – computing and communications without wires and phone lines.</td>
</tr>
<tr>
<td><strong>WIKI</strong></td>
<td>A web site that is generally editable by anyone with a computer, a web browser, and an internet connection.</td>
</tr>
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</table>
16.2 Appendix 2: Online Survey Questions

Introduction

The Tertiary e-Learning Research Fund (administered by the Ministry of Education) is supporting research into e-learning activities in Aotearoa / New Zealand Industry Training Organisations (ITOs). The aim of this research project is to increase awareness in the ITO sector of the development and delivery of effective, cost efficient and educationally sound work-based and work-placed e-learning. This survey, in questionnaire format, is part of this research project. We hope that the questionnaire will take less than 30 minutes of your time.

For the purpose of the questionnaire:

- **e-learning** is defined as learning that is enabled or supported by the smart use of information and communications technology (ICT) and

- **m-learning** refers to learning that is enabled or supported via the use of wireless communications-enabled devices (such as lap-tops, tablets, cell-phones, personal digital assistants (PDAs), or other similar devices).

Thank you in anticipation for the time spent in completing this survey.

Section 1: Background

Please note that all of the information we obtain from this survey will remain confidential to the research team. Information collected will only be reported to third parties in a summary or aggregated form that will ensure your confidentiality and anonymity. Two years after the completion of the project the original data will be destroyed.

In answering the first three questions please type your response in the text box to the right of the question.

1.1 Name of Industry Training Organisation (ITO)

1.2 Acronym used by the ITO

1.3 Number of trainees enrolled with your ITO in the past 12 months?
The following section contains general statements about how e-learning is currently being used by organisations in vocational and industry training. Please indicate the extent to which each statement reflects your organisation's activities and then use the "check box" beside each statement on the right to select your response to the statement. You will either disagree (leave the check-box blank) or agree (click the check-box) with the statement in relation to your organisation. Please check all the check boxes that apply to your organisation.

1.4 From the following list of technologies select those your ITO has supported, employed or purchased in the last 12 months? (Please check all the check boxes that apply to your organisation)

a. Resources provided on Compact Disks (CDs)

b. Resources provided on Digital Versatile Discs (DVDs)

c. A Learning Management System (LMS) such as Blackboard or Moodle

d. Computer simulations

e. Access to digital learning resources remotely from a dedicated organisational Website

f. Audio and Video files for MP3 players and/or iPods

g. Computer games

h. Computer based learning resources

i. Emerging Web-based technologies (such as Blogs and Wikis)

j. Web-based learning resources

1.5 What range of information and communication technologies (ICT) does your ITO use to facilitate the flow of information, on educational activities, to its trainees? (Please check all the check boxes that apply to your organisation).

a. Communication with trainees is by e-Mail

b. The use of computer tXt messaging has been utilised

c. The use of tXt messaging by mobile phone has been utilised
d A dedicated **Web-site** is available with all relevant trainee information

e Communication with trainees is by **standard telephone**

f Communication with trainees is by **mobile telephone**

g Information and communication technologies (ICT) are rarely used

**1.6** Which of the following describe how introducing e-learning technologies is currently regarded by your organisation? (Please check all the check boxes that apply to your organisation).

a e-learning is viewed "tactically" to meet specific training needs

b e-learning is viewed as critical in the support of trainee development

c e-learning is best used in conjunction with other teaching methods

d e-learning is used only for the assessment of basic competencies

e e-learning is not considered as an option

**1.7** Which of the following statements reflects the current state of delivery of e-learning activities facilitated/monitored by your ITO? (Please check all the check boxes that apply to your organisation).

a **ITO** staff facilitate **all** of the organisation's e-learning activities

b **ITO** staff facilitate **most** of the organisation's e-learning activities

c The **ITO** has outsourced the delivery of **all** e-learning activities for our trainees

d The **ITO** has outsourced the delivery of **most** e-learning activities for our trainees

e The **ITO** has a mixture of delivery options

f e-learning monitored by the **ITO** is mainly offered through an externally hosted learning management system (LMS).
The ITO has deployed its own learning management system (LMS)

Non e-learning deliver options are used

1.8 Which of the following statements reflect your organisation use and/or creation of online content for courses facilitated/monitored by your ITO? (Please check all the check boxes that apply to your organisation).

a ITO staff create all of the digital learning materials required

b ITO staff create most of the digital learning materials required

c The creation of all of the digital learning materials is outsourced.

d The creation of most of the digital learning materials is outsourced.

e "Off-the-shelf" learning materials are purchased from a private enterprise

f "Off-the-shelf" learning materials are purchased from a tertiary education institute

g All digital content created / purchased can be accessed and used by those with disabilities.

h Some digital content created / purchased has been designed to meet the language needs of our trainees (e.g. content in Te Reo or Pasifica languages)

i All digital content created / purchased complies with international e-learning standards (for example Sharable Content Object Reference Model (SCORM))

j Access to digital content is not offered by our ITO

1.9 Which of the following statements reflect the evaluation procedures and/or policies used to review e-learning activities facilitated/monitored by your ITO? (Please select all that apply)?

Policies and/or Procedures are in place to

a systematically gather and collate student feedback on their e-learning experience
b take action on student feedback on their e-learning experience

c monitor the impact of e-learning on student achievement

d monitor the impact of e-learning on trainer workloads

e systematically gather financial costs of e-learning delivery

f ensure all e-learning products purchased / produced are regularly reviewed for quality, currency and relevance to the organisation

g e-learning activities are not offered by our ITO

1.10 In your opinion, which of the following e-learning approaches are being used to support effective pedagogy for the trainees in your ITO? (please select all that apply)?

a A blended learning approach incorporating both face-to-face activities with e-learning technologies

b Mentoring of the trainee

c Authentic (work-based) practical exercises are offered

d Trainees contribute to the development of teaching materials

e Authentic competency assessment regimes are developed

f The application of relevant theory to the individual trainee's workplace

g Action research to identify best practice is undertaken

h e-learning activities are not offered by our ITO

1.11 Please use the text area provided below to provide more detail on your responses to the questions above or to highlight areas e-learning you feel the questions have not fully addressed.
Section 2: Managing e-Learning

This section contains a number of statements about e-learning. Please indicate the extent to which each statement reflects activities in your organisation by selecting one option from the drop down menu on the right.

2.1 The educational value of introducing e-learning into training activities offered on behalf of the ITO has been carefully considered by senior management.

2.2 The business value of introducing e-learning into training activities offered on behalf of the ITO has been carefully considered by senior management.

2.3 After considering its business and educational value senior management is fully supportive of the introduction of e-learning as part of business as usual for the organisation.

2.4 e-learning is regarded as a significant component of our organisation’s strategic planning for the future.

2.5 A formal e-learning policy is included in our annual strategic plan.

2.6 Unit, section or departmental plans clearly reflect the importance of e-learning in the ITO plans for the future.

2.7 The ICT infrastructure / technologies needed to cope with increasing e-learning activities within the ITO have been identified.

2.8 The organisation's budget has been structured to allow the long-term funding of e-learning initiatives.

2.9 A dedicated senior managerial position has been created within the organisation to review e-learning initiatives undertaken by or on behalf of the ITO.

2.10 e-learning initiatives and activities undertaken by or on behalf of the ITO are fully supported by a recognised e-learning team.
2.11 Please use the text area provided below to provide more detail on your responses to the questions on Managing e-Learning above or to highlight areas you feel the questions have not fully addressed.

Section 3: Capacity and Capability

This section contains a number of statements about e-learning. Please indicate the extent to which each statement reflects activities in your organisation by selecting one option from the drop down menu on the right.

3.1 This organisation regularly exchanges information with other ITOs on the best use of e-learning in vocational education and training.

3.2 Staff has the required competencies to critically evaluate the e-learning activities offered by or on behalf of the organisation.

3.3 Staff employed in the creation / purchase of e-learning content can access professional development on instructional design in e-learning.

3.4 Staff employed in the creation / purchase of e-learning training activities can access professional development on effective teaching and learning in e-learning environments.

3.5 Potential changes to the organisational structure generated by the introduction of e-learning have been identified.

3.6 Any potential changes to current roles and responsibilities generated by the introduction of e-learning have been communicated to staff.

3.7 The trainees with training agreements with this ITO have the required ICT skills to engage in e-learning activities offered by or on behalf of the ITO.

3.8 The trainees with training agreements with this ITO have access to online learning support to enable them to participate fully in e-learning activities.

3.9 The value of introducing e-learning into training activities offered by or on behalf of the ITO has been clearly communicated to all stake-holders.

3.10 The ITO consults regularly with all stake-holders on the best use of e-learning in the organisation.
3.11 Please use the text area provided below to provide more detail on your responses to the questions on capacity and capability above or to highlight areas you feel the questions have not fully addressed.

Section 4: Benefits of e-Learning

This section of this survey contains statements about the potential benefits gained from the introduction of e-learning to your organisation. Please indicate the extent to which each statement reflects activities in your organisation by selecting one option from the drop down menu on the right.

Please Note: There are no 'right' or 'wrong' answers. Your opinion is what is wanted.

In your opinion what will be the significant benefits to your organisation of implementing e-learning activities in the foreseeable future?

4.1 A significant degree of flexibility for trainees

4.2 Allows “just time in time” learning to be offered

4.3 Trainees can complete activities at their own pace

4.4 Resources and activities can be accessed from anywhere at anytime

4.5 Activities can be simultaneously delivered to an unlimited number of trainees

4.6 There will be an assurance of consistency of delivery of learning and teaching across the industry

4.7 Will help reduce costs of delivery

4.8 There will be a reduction in time it takes to deliver training

4.9 It will attract new trainees

4.10 It will meet trainees’ expectations

4.11 It will meet employers’ expectations

4.12 Raising the ICT skill and competence level of trainees.
4.13 Accurate tracking and recording of individual achievement and competency.

4.14 Will help with our Quality Management system for NZQA reporting and compliance

4.15 Please use the text area provided below to expand upon the points above or to highlight other benefits of e-learning experienced by your ITO.

**Section 5: Potential Barriers**

This section contains statements about the potential barriers to the introduction of e-learning in your organisation. Please indicate the extent to which each statement reflects activities in your organisation by selecting one option from the drop-down menu on the right.

Please Note: There are no 'right' or 'wrong' answers. Your opinion is what is wanted.

In your opinion what will be the significant barriers to your organisation in implementing e-learning activities in the foreseeable future?

5.1 The current technology infrastructure deployed within the organisation.

5.2 The provision of ongoing technical and learning support for participants with limited IT skills

5.3 Gaining support and commitment from senior and middle management

5.4 The costs (time, financial and human) of e-learning implementation

5.5 The organisation being able to source (access) educationally designed, organisation-specific and engaging content

5.6 Resistance to change from those familiar and comfortable with traditional learning and teaching approaches

5.7 Lack of basic ICT skills in our industry

5.8 Motivating our particular learners to complete e-learning courses

5.9 Organisational lack of knowledge on how to plan for the implementation of e-learning
5.10 The costs (time, financial and human) of maintaining e-learning activities in the organisation

5.11 Please use the text area provided below to expand upon the points above or to highlight other barriers of introducing e-learning experienced by your ITO.

Section 6: Mobile Learning

This part of this survey contains statements about the nature of m-learning in your organisation. Please indicate the extent to which each statement reflects activities in your organisation by selecting one option from the drop down menu on the right.

**Please Note:** For the purpose of the questionnaire m-learning refers to learning that is enabled or supported via the use of wireless communications-enabled devices (such as lap-tops, tablets, cell-phones, personal digital assistants (PDAs), or other similar devices.

6.1 M-learning will be a significant component of industry training in the future.

6.2 M-learning will demand a new attitude to learning on the part of learners

6.3 M-learning will demand a new attitude to teaching for people involved in training and development

6.4 M-learning will be most effective when it is combined with other teaching methods

6.5 The educational value of introducing m-learning into training activities has not been fully researched

6.6 The business value of introducing m-learning into training activities has not been fully reported

6.7 The current generation of m-learning technologies do not fully exploit the potential of m-learning

6.8 M-learning techniques and technologies will meet trainee demands for greater flexibility in industry training
6.9 M-learning techniques will help motivate more of our trainees to complete training.

6.10 The ubiquitous nature of mobile phones makes them an ideal m-learning tool.

6.11 M-learning methodologies will change the way we deliver learning resources to our trainees.

6.12 M-learning methodologies will change the way we communicate with our trainees.

6.13 M-learning and the utilisation of mobile phones will reduce the digital divide.

6.14 M-learning and the utilisation of mobile phones will minimise the need for student access to computers.

6.15 Please use the text area provided below to provide more detail on your responses to the questions on m-learning above or to highlight areas m-learning you feel the questions have not fully addressed.

**Section 7: Future Developments**

This section contains statements about the nature of "e" and "m" learning in your organisation. Please indicate the extent to which each statement reflects activities in your organisation by selecting one option from the drop down menu on the right. Please Note: There are no 'right' or 'wrong' answers. Your opinion is what is wanted.

7.1 What proportion of the trainees in your ITO do you estimate participated in e-learning activities during the last 12 months?

7.2 What proportion of the trainees in your ITO do you estimate will participate in m-learning activities during the next 12 months?

7.3 How will the adoption of e-learning approaches by your ITO change in the next 12 months?

7.4 How will the adoption of e-learning approaches by your ITO change in the next 3-5 years?

7.5 Do you consider that the adoption of m-learning approaches by your organisation in the next 2 years will...
7.6 Do you consider that the adoption of m-learning approaches by your organisation in the next 5 years will

Section 8: Additional Comments

If you wish please use the text area provided below to provide more detail on your responses to the survey and/or to highlight areas of m or e learning you feel the survey has not fully addressed.
16.3 Appendix 3: Web-Site Evaluation Matrix

Website evaluation: Information and resources for users

**Administration**

Does the site provide comprehensive information on the role and function of the ITO?
Is a strategic plan available (including a section on e-learning)?
Is there a section on the Policies and Mission of the ITO?
Does the site provide separate areas for potential trainees?
Are there comprehensive details of any training courses available to the trainee?
Can the potential trainee make electronic enquiries about courses on offer?
Is there an FAQ section on courses and training?
Is there information that provides details of career paths and choices for trainees?
Is there information on job opportunities and career progression?
Can all relevant information applicable to the trainee, be downloaded?
Is there facility for user feedback/enquiry either through email, phone or onsite response system?
Is there a section which provides information for Employers?
Does the site have a list of contacts with email and/or phone numbers?

**Mode of Teaching**

Is there a good range of information on:

- How (what technology/approaches for theory/practical) training occurs?
- Where training occurs (work-placed, work-based, online, blended, TEO)?
- How long it takes to train?
- Minimum entry requirements?
- Expectation of trainee skill set?
- Qualifications to be gained?
Can all the information be downloaded?
**Knowledge Management**

Are all details available for viewing/downloading which relate to course outlines
individual units/modules
descriptors
pre-requisites
objectives and outcomes
access to resources such as the library
Are there any links to educational resources for the trainee?
Does the ITO indicate that it provide any of the training directly?
Is there any indication a Learning Management system is used in any of the training programmes

**Assessment**

Details of formal and informal assessment regimes for training courses are provided
16.4 Appendix 4: Interview Prompts: Senior Management

Preamble

Introductions

Review of research project

Outline of interview procedures

Overall Strengths, Weaknesses, Opportunities and Threats

Q1. What would you consider are the main reasons preventing wider use of e-learning technologies in your ITO?

Q2. What, in your opinion would you consider are the strengths and weaknesses of e-learning in the context of vocational education and training?

Expectations

Q3. What are the main expectations for your ITO in using e-Learning?

Q4. Have you developed any criteria to use for the evaluation of potential e-learning solutions?

Content

Q5. What areas within your ITO would you consider are particularly appropriate for training via e-learning?

Q6. What sources of e-learning content are being used, or are being considered, by your ITO?

Audience

Q7. Who do you think will be the main target audience for the e-learning initiatives in your ITO?

Delivery

Q8. Do you think there are important pre-requisites (technological literacy, bandwidth) for the use of e-learning tools within your ITO systems?

Q9. When and where does (or will) e-learning take place in your ITO?

Technology

Q10. What e-learning technologies are currently available to your users/trainees? (LMS, Online resources, Computers, Software, other)
Q11. How robust and reliable is your current technology infrastructure?

Q12. What do you think will be different in three to five years time?

**Quality and User-friendliness**

Q13. What processes are in place to monitor and maintain user friendliness of your e-learning initiatives?

Q14. What processes are in place to monitor and maintain quality of your e-learning initiatives?

Q15. How do you think e-learning is perceived by participants and management?

**Organisation culture and operational structure**

Q16. Does your ITO have its own strategy and policies for the implementation of e-learning?

Q17. What do you think are the critical organisational factors to ensure the culture and associated structure of your organisation support e-learning initiatives?

**Cost/benefit**

Q18. Has your ITO allocated dedicated resources (physical, financial, human) for e-learning initiatives?

**Main benefits/added value of e-learning technologies**

Q19. In your opinion what are the main added value components of e-learning for your ITO? (better learning results, flexibility, less costs per learner, other,)