

**Using e-learning to build workforce  
capability: A review of activities**

**Tertiary e-Learning  
Research Fund**

***E-Learning in Industry:  
New Zealand Case Studies***

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## Executive Summary

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- I. In the current evolving economic environment, it is considered a strategic imperative to be aware of effective processes, procedures and plans to improve workforce capability through the implementation of e-learning applications, strategies and techniques. Being well informed is also seen as central to improving individual, organisational, regional, and national performance and global competitiveness.
- II. In reviewing the data generated during this phase of the research project it is apparent a number of industries in New Zealand are slowly acquiring the necessary skills and operational experience in the deployment and implementation of e-learning systems, applications and content for education and training.
- III. From the case studies it is also evident the introduction of e-learning across industry is not constrained by gender, age or level of literacy, with e-learning being offered to male and female, young and old, highly skilled and low skilled and to those with high or low levels of literacy.
- IV. For the purpose of this research project **blended learning** has been described as a design approach deliberately combining traditional methods to on-the-job and off-the-job training with e-learning applications.
- V. From the case studies it was noted the critical success factors identified for the introduction of e-learning were often dependent on the size of the enterprise (large, medium or small) and the potential resources (financial, physical and human) available to that enterprise for the introduction of e-learning initiatives.
- VI. During the review of the case studies, five emergent themes in e-learning in industry were identified:
  - *Awareness*: The raising of awareness of both management and general employees on the benefits of e-learning is a key driver for their active commitment to, and participation in, e-learning initiatives.
  - *Compliance*: The strong management capability of the e-administration tools ensures that compliance and knowledge of the workforce is audited,

tracked and managed effectively. This enables firms to meet all legislative requirements.

- *Strategic Planning:* The development and implementation of e-learning plans must be an integral part of the development of the organisation's broader training plans.
- *Management Support:* Senior management of the organisation must be committed to the introduction of e-learning. This commitment is demonstrated by the provision of the necessary physical, financial and human resources required.
- *Quality of Training:* e-learning is seen as a vehicle for improving the consistent quality of training which is essential to increase the knowledge and skill levels of employees.

**VII.** The focus of many debates on the introduction of e-learning within industry is centred on

- *Financial:* A critical issue is the perceived cost of e-learning implementation versus the investment and time out for the business.
- *Relevance and Quality:* Materials presented to employees must be firm focused, relevant and authentic.
- *Acceptance:* e-learning is relatively new and the benefits and impact of deployment need to be documented and published.
- *Infrastructure:* The infrastructure needed for ongoing development of e-learning initiatives carries costs and these costs must be identified.
- *Collaboration:* To achieve cost reduction and to increase the quality of resources developed industries are increasingly recognising the benefits to be gained by collaboration.
- *Mobile:* Mobile technologies are becoming more readily available a number of firms indicated the use of mobile technologies was a key component of future e-learning offerings.

**VIII.** The case studies indicate that in the near future there will be a steady, but notable, increase in the use of e-learning functionality to enhance and expand traditional training methods in industries in New Zealand; in essence, a blended approach to training.

## Acknowledgements

### Project Team

John Clayton: Project Leader: Waikato Institute of Technology.  
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### Project Reference Group

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Peter Olaf Looms: Consultant in Multimedia, Danish Broadcasting Corporation.

### Project Peer Review Panel

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Mark Northover: Manager, Flexible Learning, AUT University.  
Sarah-Jane Saravani: Library Manager, Waikato Institute of Technology.

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# 1. Introduction

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1.1 This section has been divided into three topics;

- Context: This section provides a background to, and overview of, the research project.
- Project Methodology: This section describes how this phase of the research project was undertaken.
- Report Structure: This section describes the purpose of the further sections presented in this report.

1.2 The key points noted in this section are;

- ◆ In the current evolving economic environment, it is considered a strategic imperative to be aware of effective processes, procedures and plans to improve workforce capability through the implementation of e-learning applications, strategies and techniques.
- ◆ In an increasingly Information and Communication Technology (ICT) dependent world, industry leaders are recognising the critical need to have an understanding of the potential of ICT and e-learning for developing competencies.
- ◆ This report describes case studies in 6 industries, identified in this report as Case Studies A, B, C, D, E and F. These qualitative studies are designed to complement the reports generated in phases one and two of this research project.

## Context

**1.3** In the current evolving economic environment, it is considered a strategic imperative to be aware of effective processes, procedures and plans to improve workforce capability through the implementation of e-learning applications, strategies and techniques. Being well informed is also seen as central to improving individual, organisational, regional, and national performance and global competitiveness.

**1.4** In an increasingly Information and Communication Technology (ICT) dependent world, industry leaders are recognising the critical need to regularly access ICT infrastructures. The flexibility provided by e-learning communication tools and presentation software applications are seen to be critical in providing appropriate web-spaces to share information, communicate with peers and experts and keep abreast of national and international trends in the use of e-learning in industry.

**1.5** This research project, *Using e-learning to build workforce capability: A review of activities* has been funded by the Ministry of Education. The Ministry has funded a range of tertiary e-learning research projects to increase the evidence base in tertiary e-learning to support and contribute to its work programme, strategic objectives and stakeholder requirements. The project aims to assess, explore, identify, describe and report on

- How Information and Communication Technologies (ICT) and e-learning applications are currently used within industry; nationally and internationally; to build workforce capability.
- How e-learning currently contributes to the achievement of advanced trade, technical and professional qualifications to meet regional and national industry needs.
- The potential New Zealand industry demand for training delivered through ICT and e-learning methodologies.
- How enterprises, from small to large, can be informed of the most appropriate blend of e-learning strategies, processes and procedures for their specific situation.

**1.6** During the project, a series of research reviews, culminating in a final research report, will be produced. These reports will serve to inform all industry sectors (large, medium and small) of how ICT and e-learning in its many forms, has and could be used to ensure effective and ongoing training is provided to the right person, at the right time, in the right place in a cost effective way. The four reports to be published are listed below;

- a.** Report 1: Overview of work-based and work-placed e-learning landscapes in New Zealand and internationally.
- b.** Report 2: Deployment of an interactive web-space to share examples of work-based and work-placed e-learning in action.
- c.** Report 3: New Zealand e-learning case studies.
- d.** Report 4: A final research report completed and delivered to the Ministry of Education and Industry sector.

**1.7** For the purpose of this research project **e-learning** refers to the provision, administration and support for 'off-the-job' and 'on-the-job' training using information and communication technologies such as stand-alone and networked computers, Internet-based technologies and mobile devices.

**1.8** For the purpose of this research project **blended learning** has been described as a design approach deliberately combining traditional methods to on-the-job and off-the-job training with e-learning applications.

**1.9** For the purpose of this report, **on-the-job** learning is structured learning that occurs within the learner's normal working environment (also referred to as *work-place* learning) and **off-the-job** (although resources are designed in context with the worker's current working practices) learning occurs outside learner's normal working environment (also referred to as *work-based* learning).

## Report Methodology

- **Overview**

**1.10** This report describes case studies in a range of industries, identified in this report as Case Studies A, B, C, D, E and F. These qualitative studies are designed to complement the reports generated in phases one and two of this research project.

**1.11** Advocates of qualitative research point out that case studies produce more detailed information and inferences than that available through statistical analyses. Moreover, 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 creativity, innovation, and context.

**1.12** 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 apply only to that participant or group, in a particular context at a particular point in time.

**1.13** 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.

- **Data Collection**

**1.14** The training managers, or their equivalent, in the six industries were contacted by e-mail at the end of April 2008. This e-mail informed all potential participants of progress made to date in the research project and invited them to participate in this case study phase of the project.

**1.15** On confirmation of an agreement to participate in this phase, a follow-up e-mail was distributed. This e-mail thanked participants for their willingness to contribute to the project and included a detailed overview of the areas to be investigated, the procedures that would be followed and identified potential interview dates.

**1.16** For the case studies, a detailed template containing 12 discrete sections was created. These sections focused on;

- Background of the industry investigated

- Target audience and drivers for development
- Workforce capabilities addressed
- e-learning application / ICT solution developed
- Participants involved in the solution offered
- Impact on building workforce capability
- Benefits of the deployment
- Barriers faced and addressed
- Indications of future developments
- Advice they would give to others thinking of using e-learning

The case study template has been included in the Appendices of this report.

**1.17** The face-to-face/telephone interviews with participants started in early-mid June 2008 and were concluded at the end of July 2008.

- **Participants**

**1.18 Industry A:** This Company is a national energy supplier with over 500 employees. The major focus of the organisation is the generation and retailing of electrical energy.

**1.19 Industry B:** This Company is the commercial education/ training division of a commercial organisation providing a range of learning and teaching technologies (LTT) to educational and training organisations.

**1.20 Industry C:** This Company maintains a large number of retail outlet stores nationwide. It currently employs 4000 people.

**1.21 Industry D:** The major focus of the organisation is the design, development and provision of training courses for the Electrical Industry.

**1.22 Industry E:** This Company is a not-for-profit organisation specialising in improving workforce literacy.

**1.23 Industry F:** This Company is a large organisation specialising in the processing and marketing of milk-based products.

- **Reporting**

**1.24** In reporting the data generated during the data collection phase a set pattern was followed.

- Firstly, the data generated was reviewed and, when necessary, edited by the researchers. In essence, this editing involved the removal of repeated comments and also eliminated filler phrases such as “you know”, “well”, “let me think”.
- Secondly, when reporting the data the “prompt question in the template” was often used as an identifier to the response. In short, the interviewer’s prompt 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 Industry A the following was reported
  - The company regards e-learning as (the interviewer’s prompt used as an identifier) *having a lot of potential to streamline and improve the learning/training environments for staff as well as saving time and eventually costs* (the interviewee’s verbatim quote).
- This pattern will appear throughout the rest of this report.
- In order to confirm validity of each case study report, a draft copy was sent to the participants for their final comments and to ensure the case study was an accurate reflection of their e-learning activity before inclusion in this report.

- **Limitations**

**1.25** While the manner of reporting 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 re-enforce

conclusions reported on in the two previous phases of the research project and are therefore appropriate.

## **Report Structure**

**1.26** The remainder of the report is presented in eight sections. The following six sections outline the case studies undertaken. Section 8, Summary and Conclusions, provides firstly, a summary of the various e-learning activities the industries surveyed are currently undertaking and secondly, conclusions are drawn about e-learning and potential future activities within industries in New Zealand. The final section, Appendices, contains the template used in gathering data and also lists key terms used in this study.

## 2. Case Study A: Energy Supply Company

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2.1 The key points noted in this section are;

- This organisation has an innovative approach to developing e-training facilities and systems that are both comprehensive and versatile, responding to the learning/training needs of a diverse range of employees
- A recognition of the needs of certain workers to develop their numeracy and literacy and establishing a supportive and non threatening environment to enable this to happen
- Employing a blended learning approach to training which combines traditional and e-learning approaches to successfully support basic to advanced trade training
- Activities by the company to ensure employees meet the high level of compliance required to operate within the industry

### 2.2 Background

- This company is a national energy supplier with over 500 employees. The major focus of the organisation is on the generation and retailing of electricity.
- All staff training for the company is coordinated by one team, which organises training for the different sites. Some sites have clearly defined training requirements for site safety certification, others may require specific training courses related to particular occupations such as sales and power generation.
- Training events are scheduled through a Learning Management System (LMS) and are a mixture of “in-house” provision and externally “out-sourced”. The events are delivered by online, face-to-face or blended modes.
- The development of the organisation’s e-learning solution began in 1999 and the current integrated system, with the extensive online dimension, was launched in 2002.

### 2.3 Audience and drivers

- Currently the e-learning solution deployed caters for both internal employees (approximately 500) and external contractors (approximately 4,000). The demographics of participants range from 18 to 70 years, with a predominance of males. *Approximately 10% of the workforce is undergoing training at any one time*
- Given the range of occupations within the company, *while not having specific data, the majority of participants would have been involved in at least one of the training systems identified, (advanced trade training, apprenticeship, Polytechnic, University, short courses and school), and in some cases they haven't had any previous training at all.*
- The e-learning solution was developed for a *multitude of reasons* which included *financial savings, flexibility and consistency in delivery, anytime and anywhere availability of courses, reducing the time taken to train plus reducing time off the job.*
- A key driver *when developing the system was to ensure there was always transparency and everything we [the training team] knew would be published and readily available* to all students and stakeholders.

### 2.4 Work-force capabilities addressed

Given the large number of employees, the scope of training provision is extremely broad and training has been developed and provided to address;

- **Health and Safety:** There are a number of *health and safety policies and procedures* identified by the organisation which are considered critical. *Of particular significance within the organisation is the high need for employees and contractors to be compliant with a variety of systems and processes.* Ensuring compliance is addressed through a range of individual site safety induction courses.
- **ICT skills:** A number of targeted staff receive training in *business specific software and hardware associated with the organisation's core business.* This includes both production technologies and business applications.
- **Literacy and Numeracy:** During the roll-out of the e-learning solution it was found the computer skills of participants were *more than adequate to undertake the*

*training offered. However, the organisation picked up deficits in comprehension and literacy when putting some employees/contractors through the training programmes online. To address this issue a literacy/numeracy skills programme was introduced using ALANA (adult literacy and numeracy assessment) online. This system is valued and is very good for adults and international staff and has had a very successful trial with an older age group.*

- **Legal Compliance:** *The industry must meet the legal obligations outlined in legislation and some training is offered to address these issues and ensure all staff are aware of their obligations.*
- **Technical and Manual Skills:** *A large number of staff are technically or trade trained and, given the nature of their occupation, are used to undertaking ongoing training. There is a definite focus in this area and a range of courses is provided.*
- **Operational Compliance:** *Of particular significance within the organisation is the high need for employees and contractors to be compliant with a variety of systems and processes. The general hazard identification is addressed in-house through on-the-job training. While more detailed health and safety requirements are addressed through external providers, for example first aid and working in confined spaces, where staff have to undertake courses/workshops/tests to obtain the appropriate “certificate”, many of these courses are mandatory and all staff and contractors have to complete certain courses to a defined standard before they are judged competent and allowed to practise on site.*

## **2.5 Solutions developed**

- **My-Learning:** *This formal online system is based on the integration of an international Learning Management System (LMS) and a learning content management system (LCMS). The integrated system allows the organisation to maintain individual learning plans and to book, track and record training activities.*
- **WorkMate:** *This informal flexible system is continually being developed and provides a range of online courses and work-related information. The system is designed to provide on-demand access to resources which enable the user to update, or refresh their skills in relation to the operations of the firm and associated equipment. In many cases, courses contribute to advanced technical/trade training in relation to the operation and maintenance of the latest equipment and technology being used within the power generating systems. The*

resources available include *authentic audio and video* clips providing media-rich explanations of *particular systems, safety aspects and their functionality*.

*Wherever possible all the training material in Work-Mate reflects authentic situations and equipment* the employee or contractor will encounter on site.

- *Simulations:* The firm has purchased *two high-level dedicated simulators that are used to train employees operating the various power generating plants*. The simulators are used to *generate authentic problems that operators must deal with, in real time, to ensure the production units are kept on stream. Downtime can be costly*.
- *Custom designed:* The organisation uses several software applications including Flash, *used in development of online materials* and Articulate, which is an *intuitive application allowing the quick integration of text audio and video*, and Captivate. *There are very few relevant CDs and DVDs available and these are being phased out*. Because the firm has a LCMS *any changes made to the content are immediately rolled-out across all courses and events, thus ensuring all materials are always up-to-date*.
- *Video Capture:* Videos of *external experts installing new plant and machinery* are captured *when the experts arrive and first install the plant*. They are also captured *during the formal training sessions provided for the employees to enable them to operate the equipment*. These videos are *then available when the experts leave and if operators need to review specific tasks*. Videos of *regular employees completing regular operating tasks (such as walk-through)* are also captured. These videos are frequently used by courseware developers as the starting point for subject matter preparation, with the video content being re-purposed into other learning delivery formats. These outputs are then published both in *formal courses through My-Learning and also informally on WorkMate*. It has been found employees access these “just-in-time” *to refresh their memory on what the specific requirements of the job are or to instruct / answer questions from junior members of staff*. Seminars / tutorials/ demonstrations are also *done on a regular basis. They are often recorded and put online*.

## 2.6 Delivery

- *On-the-Job:* The organisation is a registered provider and most training undertaken is done on-the-job through the centralised system it has developed. The firm has a *purpose-built facility within the organisation used for a range of training courses as well as classrooms in other centres*. It also has dedicated rooms for two simulators and there are a number of close-proximity computer suites for staff. In essence *at the workplace all necessary technology and equipment is available to enable participants to take the courses offered*.
- *Commitment:* The central training system groups participants according to their employment and *this serves to identify which course or courses an individual should be doing, which they have done and which need to be done again*. When courses have been completed *the outcome of any specific training module is sent to a system which notes when the course was undertaken and when the certification will expire*. The system also has an email reminder system to ensure that employees / contractors are notified when further training is required. If an employee/ contractor does not complete the required training on time their access to the site will be suspended. It is the duty of the individual to make sure they undertake the training required, not the training team.
- *Assessment:* A number of the compulsory induction / site safety online modules have mandatory assessment which users must pass before proceeding to the next module and participants must complete all activities before the course is considered to be completed. With *on-the-job practical activities a workplace assessor is used*. For some of the more complex courses and external offerings *written and formal assessments are required*. Individual portfolios and/or records of learning are used *with an individual audit of activities and the development of a learning plan*.
- *Mechanism for Feedback:* There are several feedback mechanisms in place. For example *meetings occur to plan each individual learning pathway*. Courses are selected during discussion based on strategy issues. From these meetings the selected training decisions are entered in the online system and can be tracked. After courses have been undertaken *there are a number of online surveys/tools available for course evaluation*. The feedback from these evaluations drives the further development of courses.

## 2.7 Support provided

The company has a range of support systems in place for both learners and trainers. These include;

- *Offline support:* Offline support is done either in the classroom situation or with one to one on the desktop. In general, the support provided is relatively informal. Those participants who exhibit difficulties with using computers or comprehending documentation are assisted through the use of a supportive approach which enables them to acquire the requisite skills.
- *Online Support:* There are two dimensions to this question, in the online environment there are help files and online tutorials incorporated within the LMS and associated systems. For the workplace and for specific tasks the development of Work-Mate resources provide users with the facility to work through courses which enable them to reinforce what they know or to learn new information about equipment and systems.

## 2.8 Impact

The company recorded a number of tangible benefits across the board with the introduction of a centralized comprehensive training programme. These include;

- *Time:* There is evidence that the current training system dramatically reduces the time to complete training and there is less time off-the-job.
- *Flexibility:* Since the deployment of the integrated system in 2004 there have been better results than previous methods and the solution has provided greater flexibility in training schedules.
- *Compliance:* The strong management capability of the LMS ensures that compliance and knowledge of the workforce is audited, tracked and managed effectively. The organisation has noted a better tracking of safety requirements. The evidence for these outcomes is readily available through the analysis of the data in the online system
- *Quality:* The use of the LCMS and LMS has ensured there is a consistent quality of training and resources and confidence there is now organisational adherence to accepted workplace standards. Although it's not actually measured there are definite indications that quality of the work and the working environment have improved.

- *People:* The organisation has noted there is a definite increase in the number of skilled staff, who are motivated and in a number of cases there has been a definite improvement in literacy. There is improved collaboration and communication, around subject matter delivered through the WorkMate and My Learning Portals

## 2.9 Barriers

- Any potential barriers to the implementation of the e-learning solution developed were addressed by good planning and senior management support. As was noted *Barriers to implementation didn't exist. A business case was developed and presented. This was accepted by management and the current system has evolved from that decision.*

## 2.10 Future developments

- *Blended:* Although this organisation has a strong focus on e-learning it still has significant face-to-face offerings. While they may have extended the current successful approach they will continue to do what they are doing because it works well
- *External access:* Currently the system is run through the company Intranet and accessible only from within the company network. There are plans to make course resources and courses available externally via the Internet in the near future. This will include access to the material available through the Work-Mate system.
- *Mobile:* Although not currently used, the organisation is keen to integrate mobile technologies with the current system. The issue for the organisation is the robustness and availability of appropriate mobile devices. For example, they had a mobile notebook demonstration and the supplier said we could drop them from 1.5 metres with no effect, however, when I picked one up to test, the supplier was not happy and they did not pursue this option. It is anticipated devices like the iPhone will make a difference. I think the workers will buy them for themselves and once they've got them, then we can start to use them. They believed they could use them to orientate people who are on site and for employees to check what they are supposed to do at specific points in a walk-through; I'm definitely keen on the iPhone.

## 2.11 Critical Success Factors

- *Be realistic:* While e-learning can be effective in a range of situations *it doesn't solve everything, it works well within a blended learning environment. Sometimes it meets a need and sometimes it doesn't.*
- *Collaborate:* Collaboration and cooperation *with other similar organisations will serve to establish universally accepted practice, standards and training which will ensure the skill set of the workers is comparable and transferable across sectors. The company is already doing this with a couple of similar-sized organisations employing a similar workforce.*
- *Planning:* Identify and plan early, making sure there are *adequate resources* in place, you have *senior leadership support*, improve participant *ICT literacy profile through supportive techniques*, a communication mechanism in place to *publish results for others to review* and above all *focus on the experience of the participants, what does the individual see and how do they interact with it and does it work for them?*

## 3. Case Study B: Supplier of Learning and Teaching Technologies

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3.1 The key points noted in this section are;

- This organisation is focused on developing the ICT skills of a range of educators through the practical use of learning and teaching technologies
- The firm provides a planned approach to ICT training which meets the needs of a wide range of educators
- Support for learners within and by different organisations is inconsistent
- The level of ICT skills and the application/ embedding of ICT in teaching and learning by practitioners is variable

### 3.2 Background

- In essence, this company is the commercial education/ training division of a commercial organisation providing a range of learning and teaching technologies (LTT) to educational and training institutions throughout New Zealand. These technologies include interactive white-boards and associated pads plus interactive polling systems for quick quiz sessions in the classroom.
- The company is located in a large regional centre on the east-coast of the North-Island and has a staff of five.
- As well as offering external professional development opportunities to embed educational technologies into teaching and learning it also provides “in-house” training to staff to ensure *they have the cutting edge knowledge required for their position* in the company.

### 3.3 Audience and drivers

- Between January and June 2008, 350 *predominantly female clients*, ranging in age *from early-twenties to mid-seventies*, participated in external organised training events and/or demonstrations. The participants included *educators across the education sector and the employees who provide the training*. *The current system was planned and introduced as part of the company strategy to*

*provide more than just technical training to a wide range of educators who need to understand the pedagogical implications of new technologies.*

- *In general the majority of participants are already trained teachers/educators (some teacher aides). Their literacy/numeracy would be judged as 'good'. Most of the participants will have had University education and others a range of other courses/ training.*
- *The range of information and communication technology skills of participants was generally very broad with some having very basic skills while others were quite advanced. The age of participants or length of teaching service was not an apparent factor in the ICT skill level of participants as even some recent Teacher training graduates have only very basic ICT skills.*

### **3.4 Work-force capabilities addressed**

Given the nature of the core business of the organisation, the supply of ICT technologies, the training provision has been developed and provided to address;

- *Technical and manual skills: The technical and manual skills required to use educational technology are embedded in ideas on how to use ICT to improve teaching and learning provision.*
- *ICT skills: Although standard software applications are not demonstrated / taught the interactive whiteboard was used as a means to demonstrate/teach applications that operated with the device. These included a range of software applications from the office suites and web-browsers to Web 2.0, photo editing packages, video editing packages etc but always led by the needs of the teachers and learners not by the technology.*
- *Product Knowledge: To increase market share, staff need to be knowledgeable about the products the company supplies and trainers receive ongoing support provided by the company in the range of LTT supplied.*
- *Certification: The Company provides formal recognition for training undertaken; in some instances certification was possible. Participants had to be involved through both online and face-to-face activities.*

### 3.5 Solutions developed

- *Custom Designed:* A range of custom designed material is produced by the organisation. Product overviews *related to the equipment being used is readily available* and videos containing *examples of good practice are produced and these are used in DVDs.*
- *Blended:* The firm's internal trainers enhance face-to-face training with laptops and computers in *varying degrees depending on the training environment and the availability of ICT to the participants.*
- *Internet:* A complex web-space with links to a range of resources such as personal blogs, links to courses on Moodle *used as a teaching/ learning tool in the training sessions,* and a Wiki are available for participants.
- *Mobile:* Given the distributed location of many of the training sessions *Smartphone's are used for text (tXt), email, audio* to keep trainers and participants in contact with each other.
- *Web-Conferencing:* Given the remote location of many participants *the lack of numbers making course delivery in some remote locations uneconomic, using videoconferencing more creatively may improve the situation.* In reviewing the alternatives *Skype has been used to deliver some sessions.*

### 3.6 Delivery

- *On-the-Job:* Workplace/on-the-job provision accounts for some of the training and *trainers will sometimes take a class session with the educators observing. This will have follow up sessions to evaluate the use of the ICT by the educator.*
- *Learning Centres:* *The organisation has agreements with 47 schools or education institutes across the country, enabling the company to use the facilities for regional training hubs*
- *Time Commitment:* The time commitment *varies quite a bit. It depends on what the organisation requires. Much of the training is tailored to individual organisational needs, can have part 1 and part 2-3-4.*
- *Assessment:* A significant *component of the training is assessed through portfolios with participants expected to submit lesson plans and develop teaching resources based on the training provided.* Observations of technology used by a *trained assessor* are also used to assess participants' competencies.

- *Evaluation:* After the completion the training a number of systems are in place to enable evaluation of training using on and off line resources and ‘tweaking’ of training regularly occurs as result of feedback.

### 3.7 Impact

- *People:* Anecdotal evidence has indicated the customers do become more competent with the ICT. Since teaching certainly improves, the trainees tend to want more training and they tend to be highly motivated.
- *Production:* Internally, the organisation has found the provision of training has the potential to increase its customer base. Probably the outcomes of the training in one particular location can operate as a marketing tool, e.g. one school tells everyone else (others) who then get involved and request training which in turn will result in further referrals.
- *Retention:* Although there is no actual evidence that retention is improved, by providing these sessions schools seem to think they will retain staff if they provide PD in ICT, especially in low decile schools.
- *Quality:* There has been an improvement in the quality of the educational events delivered. This has been measured by a variety of means that include observation, evaluation forms, anecdotal feedback and some quantitative analysis. The firm has also created a Wiki to list case studies in learning achievement that provide evidence of improvements.

### 3.8 Barriers

- *Financial:* The organisation has found implementing training in rural schools is problematic. There are two reasons for this firstly rural schools themselves don’t have sufficient funds to implement training and secondly, to travel to these schools is not an option for the company because of the costs involved in delivery increase according to distance travelled.
- *Management Support:* Although the firm’s focus is on the customer, they have frequently found, when arriving at delivery locations, senior management have not adequately prepared staff for the training offered - in many cases there is a lack of organisation/ planning for the training event for the educators, perhaps because there are too many other things to do.

- *Motivation*: When delivering training the firm has encountered some resistance issues from educators who don't see why they should change and adopt/ embed ICT in their teaching. While this resistance can be overcome by including a peer /mentoring system in the contract to train, often resources are not available to provide the support and input required to work with someone who has been teaching for thirty years and says, "Why should I change?"
- *Infrastructure*: Access to appropriate technology is a real issue in many schools. The lack of funding within schools means some schools can't afford ICT network support and overworked IT staff means in some cases software is not on the network or computers fast enough.

### 3.9 Future Developments

- *Blended*: This organisation has noticed an increasing demand for web-provision - two years ago no requests were received for an online dimension, now there is, and it's increasing. As teachers should become more au fait with a LMS the organisation will use its learning management system as a learning/teaching tool as opposed to using it for learning/training events. However, the firm recognises full web-provision has its limitations and the blended approach is the way to go, the face-2-face sessions are really valuable. The participant feedback received indicates participants really appreciate the F2F components. This may be because this environment is familiar and the comment 'non threatening' occurs many times in the feedback received after sessions have been delivered.
- *Mobile*: Although there is no demand as yet for using mobile devices the organisation is anticipating change, therefore looking at what might be working. Internally, training staff have a passion for developing resources around the use of mobile devices.
- *Videoconferencing*: Given the costs associated with delivering appropriate training to rural and remote schools in the future there will probably be more use of videoconference for training and support.

### 3.10 Critical Success Factors

- *Awareness:* While in general, educators in all sectors' knowledge of what ICTs are available have increased there is an ongoing need to continually raise the awareness of its potential in all sectors. This will lead to an increased uptake and embedding of the technologies in teaching and learning.
- *Adequate Resources:* Current funding for training is by no means adequate or sustained to the level required if educators are to become expert practitioners in e-learning. This is particularly notable for those schools in rural areas. There is a need for increased government professional development funding.
- *Provision:* Training provided in ICT needs to be well planned and ongoing and when selecting providers there needs to be a partnership. This company has found the consultancy that operates between the customer and the provider works to foster increased knowledge and ongoing communication. Organisation focused companies such as theirs are playing an ever increasing role in training educators in the use of ICT. The staff have cutting edge knowledge and this specialised knowledge is what schools actually need.

## 4. Case Study C: Large National Retailer

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4.1 The key points noted in this section are;

- A commitment to developing and improving work based training through the use of e-learning technologies in conjunction with traditional methods
- A blended learning approach is seen as the mainstay of training in the foreseeable future
- The importance of support from the CEO in order to ensure that the new strategy will be a success

### 4.2 Background

- This company maintains a large number of retail outlet stores nationwide. It currently employs 4000 people of which, in 2007, over 2000 undertook work-based or workplace training. Although specific outlets have specialized training needs, in general, staff training is coordinated by a central team. In fact, the company has created its own College of Retailing to *enable all employees to improve their skills to reflect those required by the company.*
- A training Calendar is produced each year and, in general, most training is scheduled to occur between March and September as *the period between October and February is our busy period.* The training provided is a mixture of “in-house” provision and externally “out-sourced”.

### 4.3 Audience and drivers

- In 2007 2,226 trainees ranging in age from 16 to 70 years undertook work-based or workplace training. The company is anticipating an increase in participation in training of approximately 15% in 2008.
- Although a small number of employees had attended a tertiary institution and some had undertaken industry training, the highest level of educational achievement for the majority was secondary school.
- While the training system in place has previously met the training needs of the company the ever changing nature of the retail market has forced the company to

review its training provision and schedules. It has *recognised the need to up-skill its staff on a more regular basis and are looking at other ways of providing training to complement our current approach*. It has also recognized there is a need to *make training as flexible and cost effective as possible while meeting the needs of the employees and the organisation*. The company is currently in the early stages of what has been described as developing an *evolving training culture*.

- The company regards e-learning as *having a lot of potential to streamline and improve the learning/training environments for staff as well as saving time and eventually costs*.

#### **4.4 Work-force capabilities addressed**

Given the large number of employees, the scope of training provision is extremely broad and training has been developed and provided to address;

- **Induction:** All staff are required to undertake this introduction to the firm. The session uses a short 9 minute DVD, produced in-house, which provides employees with general information about the organisation. It also provides a paper-based outline of processes and procedures used within the firm and training support available
- **Health and Safety:** There are a number of health and safety policies and procedures identified by the organisation which are considered *critical within the working/ sales environments for both the customer and the staff member*.
- **ICT skills:** A number of targeted staff receive training in a range of software applications used in the normal business operations of the firm.
- **Literacy and Numeracy:** In general, this area is addressed through the promotion of the courses under the umbrella of the Retail ITO. *Courses are promoted for a specific (small) group of retail assistants where it is thought they will benefit*.
- **Legal Compliance:** The retail industry must meet the legal obligations outlined in relevant legislation such as The Consumer Guarantee Act and The Fair Trading Act. Staged training is used to address these issues and ensure all staff are aware of their, and the organisation's, obligations to the consumer.
- **Technical and Manual Skills:** In general, this area is addressed through promotion of the courses under the umbrella of the Building and Construction ITO. A third party provider runs classroom sessions and technical skills sessions on site.

- *Product Knowledge*: To increase market share, staff need to be knowledgeable about the products the store retails. Some product suppliers provide a range of DVDs which include *some robust technical information included amongst the commercial stuff* and these are promoted to staff.
- *Operational Compliance*: In general *hazard identification is addressed in store through on the job training*. While more detailed health and safety requirements are addressed through external providers, staff using specialist equipment, such as fork hoists, have to undertake courses/workshops/tests to obtain the appropriate “Licence”.
- *Communication*: This includes dealing with customers and building team relationships.

#### 4.5 Solutions developed

- *Custom Designed*: Custom designed DVDs, generally created in-house, have been created to meet the specific retailing needs of the organisation. In many instances these are supplemented by digitally created, but print-based, workbooks.
- *Enhanced Face-to-Face*: The firm’s internal *trainers take a laptop and DVD and use a data/video projector for specific groups for certain short training sessions*. Identified specialist product suppliers also provide computer-enhanced demonstrations.
- *Simulations*: A simulation, which is now considered *rather dated* focused on *running a hardware store*, is used in some of the training offered.
- *Intranet/Internet*: A number of informational “web-pages”, outlining product functionalities and specifications, are readily available to both customers and employees.
- *Mobile*: A trial using Personal Digital Assistants (PDA’s) was undertaken with a national telecommunications provider. However, it *hasn’t worked*. *The challenge is choosing the right hardware*.

#### 4.6 Delivery

- *On-the-Job*: Workplace/on-the-job provision accounts for a large majority of training and between *eighty and ninety percent of training is provided through this approach*. Because of this a significant “mentoring” culture has been created.

- *Time Commitment:* The majority of the in-house training courses developed through the College of Retailing are based on four or eight hour blocks. Employees generally undertake the training at work and have reasonable access to the necessary ICT equipment.
- *Assessment:* All formal courses, generally offered through recognised Industry Training Organisations, is assessed off-site through a recognised assessment structure. Workplace/on-the-job training is assessed by *on and off the job 'verifier'*.
- *Evaluation:* After the completion of each in-house training event a standard rating evaluation form is used by participants *to rate the course, the approach, the environment and the trainer*. Once a month these evaluation sheets are collated and any concerns/issues are addressed.

#### 4.7 Impact

- *People:* Sometimes this organisation is *working with people who may have struggled at School*. The blended environment being developed within the organisation has proven to be beneficial with the organisation, revealing once *people are in an environment they enjoy they seem to do very well. Some develop good problem solving skills*. In general, staff have moved *from low skill to higher-level skills*.
- *Production:* Although *there is a long way to go* the organisation has found the *growing use of DVD is improving speed of learning/training* and reducing employee *down-time*. Anecdotal comments also indicate there is a better, more informed service provided to the customer and a safer working environment created as *better safety records do accrue*.
- *Retention:* The provision of “staged” and tracked training has improved employee retention rates *Staff activities are tracked and more staff are definitely staying in the business longer*.
- *Quality:* e-Learning is seen as a vehicle to improving the *consistent quality of training which is essential*. Digital formats also allow the organisation *to include regional differences*. They allow reinforcement and events are no longer a *‘one off’ training session, participants can go back to the online resources at anytime*. *We know there is only one chance for the employee to learn with traditional courses, but e-learning changes that*.

#### 4.8 Barriers

- **Financial:** Like all organisations, a critical issue *relates to the perceived cost versus the investment and time out for the business*. E-learning needs to be sold to managers and *there will need to be convincing evidence for the branches that investing in the hardware for e-learning is worth it*. A major selling point is *comparing the cost of the traditional system with that of an online system, where employees wouldn't have to leave the premises so often, would identify a reduction in travel costs and time*. In essence, *the whole e-learning system has to pay for itself to be successful for all involved*.
- **Management Support:** Traditional approaches to training are well known and accepted and *it may be a challenge to get the traditionalists to adopt the new approaches*. However, this will be overcome in this organisation as *there is great support from the top*.
- **Relevance and Quality:** It is recognised by the organisation the production of DVDs and e-learning materials is a costly venture. They have attempted to outsource some materials but the materials were not relevant, *we did investigate some material from Australia, a simulation, but it wasn't what we wanted*. Producing materials, especially DVDs in-house can also raise issues as some *may be expecting high quality video like TV and Xboxes* and this may not be possible within a constrained budget.

#### 4.9 Future Developments

- **Blended:** Although this organisation recognises *e-learning is a solution to our future training* they still believe elements of a *classic traditional approach is still worth retaining*. They *definitely believe that blended learning is the way to go*. In essence, the organisation will *continue to do what we are doing with the Retail College and develop the blended approach*.
- **Collaborative:** The organisation has recognised that while *it would be good to share resources across the industry* facilitated by the Retail ITO, the *competitive nature of the industry is a challenge*. Retail organisations *need to get together and share with their industry hat, not their business hat*. To help reduce costs and increase the quality of the resources developed the organisation sees benefits in working with producers of goods they sell. They *want to take a partnership approach with some of our major suppliers and they will be helping to fund and develop our online resources, offset our costs*. The anticipated benefits for the

suppliers are the sort of commercial break stuff for their adverts will be their payback.

- *Support:* For e-learning deployments to be successful they will have strong support from our in-store network and suppliers. They also need ongoing strong senior management support for training. This will ensure there will be a range of training options available for our owners and stakeholders.
- *In-House:* The College of Retailing will have options to do e-learning with Web and DVD (linked) resources with a whole range of modules and assessment. We will be able to do tracking through the LMS. We will retain many of our traditional College of Retailing courses that people can go to. My thinking is that they (staff) will have done X number of modules and then can go on to do other courses either online or through the College.

#### 4.10 Critical Success Factors

- *Awareness:* Organisations need to be clear of how they will use e-learning to meet their specific training needs. They need to be cautious and *don't get involved in the hype from all the providers*. To introduce e-learning successfully firms should do your homework, spend the time, adopt a conservative approach. In essence, *if you don't understand it why would you get involved?*
- *Senior Management Support:* Support from senior management is essential *if you have the ear of the CEO and the support of the Board around commitment you can justify the spend, evolve the business*. To obtain this support a major challenge will be justifying the up front costs. Organisations need a clear idea for the future, for example, being able to state *in 24 months time we will start to get some traction and the ROI/ payback period might be three to five years*.
- *Technical:* In selecting an e-learning solution, organisations need to be aware *Cynics might say that you spend all the money and the software will be obsolete in two to three years time*. It is important you select the appropriate software and infrastructure. This particular firm are very interested in looking at Moodle as an *easy to use system for our employees as there is a world wide community involved in open source. Upgrade as and when necessary*.
- *Provision:* The process of reviewing training provision *has identified for us the need to develop a new robust work-skills matrix from entry level to advanced. This skills matrix will drive any new initiatives and tell us what courses we need to be running more of*.

## 5. Case Study D: Electrical e-Training Provider

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5.1 The key points noted in this section are;

- The need for electricity workers to be regularly updated on legal, safety and compliance issues
- The need to reduce the cost of training and down time for the training
- The development of a central repository accessible through a portal which enables electrical workers to get information, advice and training from one source

### 5.2 Background

- This company is a small business, with a staff of four, operating in a large urban centre. The major focus of the organisation is the design, development and provision of training courses for the Electrical Industry. It currently delivers its training through distributed locations and has developed an online portal which is designed to *complement and enhance traditional “off-line” courses as well as being an independent learning environment.*

### 5.3 Target audience

- The number of people involved in “face-to-face” and mixed mode (including online components) varies from between 6,000 to 10,000 per annum. The majority (95%) of participants are male with a small number (5%) being female.
- In general, those participating in the training programmes offered *would have been trained either through the trade apprenticeship system, Polytechnics or schools.*
- Because of the current use of ICT by the industry and *because of the nature of the occupation it is assumed that the majority will have easy access to a computer and the Internet.*

## 5.4 Key drivers for development

- **Compliance:** People involved in the electricity industry are required to meet a number of requirements (such as health and safety, site safety, as well as legal requirements). Currently, information on the compliance requirements are “scattered” and can be tedious to locate. *The reasons for developing this e-learning initiative was to enable ease of access to all the required resources and materials for electrical workers. It also provides them with a range of e-courses to upskill, get up to date with recent changes or to meet compliance requirements.*
- **Cost:** By locating *all the resources in one place it reduces costs and time, plus provides a degree of flexibility in the organisation of training programmes for the individual user.* The company also anticipates registered companies will have an *online interface personalised for their company with associated logos and internal (secure, company specific) information.* This use of centralised resources with individual branding will ultimately *reduce training costs to individual companies.*
- **Learning:** The amount and types of information electricity workers have to become familiar with is complex and is often presented in ways which, for some, are difficult to comprehend. *Some guys really struggle with literacy/numeracy.* The company’s aim is to *take the difficult-to-comprehend sections of the legislation and, using the latest multi-media technology, to explain it in a simple and easy-to-understand way.* In essence, *from legislation to simple explanation.*

## 5.5 Work-force capabilities addressed

The e-training solution was developed to address/improve skills in

- Health and safety in general but with a specific focus on certification for site safety
- ICT skills, addressing a range of capabilities with computer-related technology
- Literacy and numeracy through the design of the sequencing and structure of the training programme
- Legal Compliance for certification of the range of legislation related to the electrical industry
- Trade, technical and manual areas through specific subject-focused training programmes

- Obtaining certification for various activities which are dependent on specific knowledge of electrical principles and practice and renewing practising certificate for registration purposes.

## 5.6 Solutions developed

The following range of content creation tools are used to create and develop materials for the training/education initiatives

- *Custom Designed:* The software application “Flash” is used by the company for creating *interactive online exercises and demonstrations of, for example, common elements of electrical circuits and electrical principles and practice.*
- *Internet:* Web-pages, and associated links, have been created *to provide access to a comprehensive range of information specifically related to the electrical industry.* The Web-portal the firm has designed and deployed also provides *secured access to a range of online courses, each of which is designed to have modules no more than 20 minutes duration. The material developed for these courses can also be used for blended learning purposes.*
- *Simulations:* Simulations on and off the Web form a large component of the teaching materials. They are designed *to enable the user (learner) to test their skills and comprehension of a number of electrical systems. Fault finding and resolution exercises are built into the simulation models.*

## 5.7 Delivery

The company employs a range of delivery methods for its courses. These include

- *Computer based:* CDs and DVDS are used extensively *to demonstrate electrical principles and practices along with safety issues and procedures.*
- *Internet:* Interactive Web tools (such as discussion boards, e-mail) are used as part of *a framework of support for the online courses and as supplementary resources for face-to-face teaching sessions delivered by the company.*
- *Mobile:* The Company is beginning to develop resources to be available on mobile devices such as PDAs and cell phones. *Checklists and forms are already available so workers can do an electrical safety checklist or rank problems in order of risk of occurring, on his/her PDA.*

- *Simulators*: A range of web-facilitated demonstrator simulations and associated short courses have been created. These are based on many of the ‘hardwired’ simulations, representing electrical principles and practice and safety in the workplace. *These models consist of a range of simulated electrical circuits and systems (e.g. a house electrical circuit or a number of appliances) into which faults can be programmed and the participant can use their knowledge, skills and tools to detect faults, safety issues and apply their knowledge to resolve the faults.* Each of the online courses incorporates an assessment module in the form of a short test which enables the user to check their knowledge of electrical process and application.

### 5.8 Support provided

The company has a range of support systems in place for both learners and trainers. These include;

- *Student/trainee mentoring*: Dedicated “mentors” from the organisation are readily available for access online to advise and assist participants in the various courses. This involves forums, a question and answer system, email and Txt facilities which enable participants and their tutors to interact with each other and discuss problems and areas of interest. E-mail is also available.
- *Offline support*: Phone contact details are provided to enable students to contact course facilitators.
- *Trainer support*: The company provides professional development to ensure the trainers have currency of knowledge and the requisite skills to manage and run the e-training courses.
- *Evaluation*: Mechanisms for feedback are available both on and offline. The offline feedback is in the form of feedback sheet, which is completed by course participants at the end of each session. Online feedback consists of an electronic form which can be filled in by the participant at the end of each course. Feedback is regularly reviewed by the trainers and appropriate response instigated.

### 5.9 Impact

- *Health and Safety*: Health and safety are critical issues for the industry as any mistakes can have potentially serious consequences and even the one-man-band needs to show they comply. The downloadable interactive forms on this site mean health and safety contracts can be generated from a generic template and completed/ accessed through the Web for any worker and customised for a

*specific job*. Staff incident reports and *plenty of anecdotal evidence* indicate the number of accidents in the workplace is reduced. *The major advantage of the courses is a definite improvement in workforce and workplace safety.*

- **Compliance:** The current range of courses have enabled electrical workers and organisations to keep themselves *up to date with electrical principles, practices, regulations and legal compliance issues*. It also allows individuals and firms to quickly select material for specific worksites in a timely way. *The average electrician doesn't have the time to plough through 200 pages of text to find out what regulations apply to a particular job*. E-learning solutions allow participants to undertake *short online 'tests' to enable the user to be deemed competent and safe to practise*.
- **Quality:** Anecdotal evidence indicates *that the knowledge and skills of the workers are definitely increased*. This increased employee knowledge base means *the quality of their outputs is improved* providing firms with a *competitive advantage*.
- **Time Commitment:** It is envisaged that the online dimension to the programmes will reduce worker downtime as *initial findings indicate that the learning is faster and the online dimension provides more flexibility* for the learner. This flexibility means workers have *anytime access to resources and training* meaning the training can be tailored to *be least disruptive to a firm's work schedules*.

## 5.10 Barriers

- **Acceptance:** Online learning is relatively new to many in the industry and because *it is a small company, it does experience some reticence* from some firms to become involved in the training courses *mainly because they are not sure of the ability of the company to 'deliver the goods'*. However, *as the courses gather momentum and feedback from users is positive*, it is hoped *this reticence will diminish*.
- **Recognition:** Again, as online delivery is relatively new in the industry there is reluctance *by some authorities to accept that online learning can provide answers to a number of training problems and issues*. However, the company does note that when dealing *with the Electrical Registration Board they always get an enthusiastic response to their initiatives*.
- **Staff:** With the wide range of ICT used to create and deliver courses and *the rapid changes in the technology* it is often difficult to employ *qualified people to teach*

*and manage the programmes. These are in short supply, resolving this will take time and training.*

- *Cost:* The financing of the development and deployment of the online resources presents a real challenge. It is hoped *sponsorship by various component manufacturers may make the financial side easier to manage with advantages to both sides.*
- *Infrastructure:* While providing *the online dimension with the potential to enable the completion of anytime anywhere training*, the infrastructure needed to participate could *present some challenges both from the emerging technologies and understanding how they work, plus the software applications and their cost.*

### **5.11 Future Directions**

- *Mobile:* The firm has recognised its target audience is “practically” oriented *these people learn by doing. The tactile dimension is important. One you get the touch screen stuff, you’ve got interactivity.* Therefore mobile technologies (such as phones, PDAs and cameras) *will enable information to be accessed remotely and to transfer data/ information back to the office. There is a lot of potential to save time and for the manager to be aware of and respond to issues on job site.*
- *Internet:* This company will continue to focus on *the development of the online systems because the evidence to date indicates that they work very well.* The company predicts that *within 5 years a very high percentage of all the training courses they operate will be online.*

### **5.12 Critical Success Factors**

- *Awareness:* When contemplating a change from traditional modes to online learning, organisations need to be aware of potential resistance to change. In order to articulate a clear vision *they need to persevere and ensure there is true commitment and support for the outcomes.* They also need to ensure the new delivery mechanisms are recognised by “official” agencies - *there is a definite need to get the relevant authorities on their side, right from the start.*
- *Cost:* Although *modern technology makes the learning much easier for the learner and provides choices as to how, where and when they learn*, it can be an expensive undertaking *with high “up-front” costs.* The benefits accrued, as e-

learning options *are more cost effective over time*; need to be clearly sold to clients.

- *Evaluation*: To help embed e-learning in electrical training, *feedback from users of the online system* needs to be regularly obtained. This evaluation of *the online courses is continuous process, serving to improve and expand the resources available to the electrical workforce*. It will also demonstrate the cost effectiveness and acceptance of the e-learning solutions developed.

## 6. Case Study E: Literacy Education Provider

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6.1 The key points noted in this section are;

- There is a real need to focus on literacy training at all levels
- The company is involved in three main areas,
  - workplace literacy programme delivery,
  - working with professional development programmes and
  - information services and library
- A major challenge in developing literacy training materials in an e-learning format is the basic educational background of the majority of learners
- The online New Zealand literacy portal provides a valuable resource for a wide range of organisations involved in literacy and numeracy training
- Adequate funding to develop and deploy e-learning materials is a real issue.
- Resistance to adopting e-learning, presents some problems especially with traditionalist
- The literacy training currently undertaken is producing very positive results in many organisations

### 6.2 Background

- This company is a not-for-profit organisation specialising in improving workforce literacy. It employs 50 staff and is located in a substantial North Island urban centre.
- As well as providing *ongoing professional development for literacy and vocational tutors, and industry and workplace trainers* the company also makes available to anyone doing vocational education and training including tutors and trainers and ITOs, a range of free *national and international resources in different formats (CD, DVD and print) along with access to online materials and resources.*
- In essence, staff of the company *works in collaboration with business, industry, ITOs and tertiary education organisations* to develop and/or deliver *workplace*

*literacy programmes that are designed to meet the workforce literacy needs of the individual client.*

### **6.3 Audience**

- Between January and June 2008 one-hundred and fifty predominantly female participants participated in professional development activities. The current system coordinated as *part of a national strategy to provide literacy training to a wide range of educators*
- Between January and June 2008 approximately 6-800 learners *were involved in work place literacy programmes*. These were mainly male in the 30-40 age group. *The majority have little if any prior education/training apart from school and some short courses e.g. Forklift course*. For this group an attempt is made *to provide advice on matching the resources with the type of trainee e.g. the youngsters are more likely to use online materials*.

### **6.4 Key drivers**

- The key driver for development is based on the national *literacy, language and numeracy action plan and the clear need to raise the literacy level throughout the workforce and contribute to increased workforce capability and productivity*.
- The company also *responds to the needs of individual organisations which have an ongoing problem such as dealing with waste or is introducing something new*.

### **6.5 Work-force capabilities addressed**

- Given the nature of the organisations core business - literacy education - the training provision has a relatively narrow focus. All training developed and provided has been designed *to address literacy issues in the workforce*.

### **6.6 Solutions developed**

- *Off-the-shelf*: A range of international and national digital resources, *especially CDs and DVDs*, have been used. Other resources have also been deployed, for example *some of the Australian Flexible Learning Framework 'Toolboxes' have been used, as well as You Tube videos in professional development*.

- *Blended*: The firm's trainers occasionally enhance face-to-face sessions with *data/video projectors in conjunction with some materials on the laptop and Web*. Also a number of *face-to-face workshops are run which are integrated with online materials*.
- *Internet*: An organisational web-space is maintained with links to a range of resources such as the *New Zealand Literacy Portal*. *Related online resources are linked from the portal and there is searchable catalogue online*.
- *Custom designed*: Custom designed solutions occur when the training programme being developed is unique to the particular organisation. Using a *Health and Safety incident system online is a good example*.
- *E-Administration*: This organisation has a custom designed online database which is used to capture and store all the outcomes from all the work place literacy programme it offers. This database contains information on what tutors did in a programme session, what came out of it and what needed to be followed up plus any other relevant information.
- *Learning Management Systems*: Many of the staff participates in external courses such as the *NZCALE (Specialist educator)*. This is normally done through an external provider which uses an online dimension for the course through the *LMS, Blackboard*. The company does have limited use of Moodle and currently this is used as an area for depositing useful resources for the tutors and trainers. Its use is likely to expand in the future, depending on funding.

## 6.7 Impact

- *Flexibility*: Using e-learning provides the opportunity to undertake training any time, anywhere and *for those involved in being trained, this is definitely the biggest benefit*.
- *Quality*: Using e-learning resources means there is a *consistent quality of training offered*. Evidence indicates our approaches have been very effective.
- *People*: The organisation has produced a readily available DVD for *marketing purposes which demonstrates how people moved from one level of skill to a higher level of competence*.

## 6.8 Barriers

- *Financial:* The organisation has found *the cost of developing e-learning is still a barrier and obtaining sufficient funding for development is a challenge.*
- *Acceptance:* Traditional methods of literacy training are well understood and the organisation has encountered *some degree of staff resistance to using e-learning. Comments such as the 'I can't do it' syndrome, or the kids are on the computer so "I don't have access" are not uncommon.* There has also been resistance from some clients, for example they *tried very hard to get a national organisation to create a "how to" simulation which would have made a significant difference to the trainee learning and understanding but without much success, the national organisation regarded this approach as a bit too modern for them!*
- *Infrastructure:* Access to appropriate technologies and support *can be a real issue. Online access for professional development participants is difficult or printers not available or the output was not in colour and sometimes the equipment available was too old to be able to use the digital resources that were available.*

## 6.9 Future Developments

- *Blended:* The organisation is conscious *literacy development needs are significant* and the wide range of clients and their experiences means *it's never going to be addressed through one to one approaches. It's got to permeate at all levels from tutors to trainers to ITOs and get them to think about their systems and processes.* One solution may be a *blended approach designed to meet firm's individual needs. Need to have some champions to develop new initiatives.*
- *Awareness:* *The actual use of e-learning will be dependent on what the company wants the trainers to do.* In many cases the organisation is *dealing with digital immigrant, not an easy task* and often *the company wants the trainers to use their documentation and processes and much of this is in a printed format.* Employers need to be convinced of the benefits of e-learning and that it *has a lot of potential. They need to be convinced of this and how it can be used, once they have experienced it, it makes the whole training process easier.*
- *Mobile:* There is a recognition *young trainees and the like have mobile phones* The issue for this organisation is *so what can you do to make good use of them in learning?*

- *Cultural diversity:* This firm recognises *there are still lots of issues around resources available for Pacifica people because of cost of development. This needs to be addressed.*

#### **6.10 Critical Success Factors**

- *Management support:* Although planning for e-learning implementation is important *probably the most critical factor is getting leadership support. If you don't get that you are not going to get the resources.*
- *Raising awareness:* When reviewing e-learning it is important to share and learn from activities of others. *Publishing results is good because you can learn a lot from what others have got to say about what they have done.*

## 7. Case Study F: Milk Processing Company

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### 7.1 The key points noted in this section are:

- E-learning has the potential to reduce the need for all training regimes for staff to be off the job
- The critical importance of ensuring that the CEO and senior management of the organisation have a sound understanding of the value of e-learning in educating and training employees. This is a 1-3 year journey
- A blended approach to the training of employees gives the best results
- Initial experience with the online learning management system Moodle for e-training initiatives has been very positive
- Currently the company has 80% of its training carried out 'off-the-job' It aims to have this reversed so that at least 80% of its training programmes are supported by e-learning, on job training and coaching
- The global dimension of the company facilitates sharing of resources and best practice
- Challenges exist with the integration of new e-learning approaches and technologies with current company IT systems

### 7.2 Background

- The major focus of this international organisation is the processing, manufacturing and marketing of milk based-products. The company has a number of production plants across the country and in the current year *provided training for over 6500 employees at 26 national sites and some international sites.*
- The organisation has *a team of six people within the L and D (Learning and Development) group that performs needs analysis, internal consulting and evaluation of developed courses. They also can train others (human resource*

personnel and managers, plant staff) *to deliver the training to the other staff.*

Ensuring those immediately responsible *own the delivery of the training.*

- Training events for the company are coordinated by Training Coordinators which there is a group of 8 and are mixture of “in-house” provision and externally “out-sourced” events.

### **7.3 Audience and drivers.**

- Currently *the e-learning dimension* deployed caters for *approximately 2,500 employees.* The *average age of participants is 40 years with a predominance of males.* All participants *have ready access to appropriate technologies at work.*
- The major reasons for development of the e-learning initiatives were *to enable staff to increase their opportunities to apply their knowledge to the job and for senior management to recognise the commitment to training as a real investment with a definite ROI. E-learning offers the opportunity to move compliance training online freeing up more time for developmental training*
- The levels of literacy and numeracy of participants was *reasonable: level 1 NZCEA* and many of them had previously undertaken *off job short courses at level 3 National Certificate.*
- While currently *80% of training is done off-the-job with the other 20% on-the-job,* the Learning and Development group is working *to reverse this so 80% is done through an e-learning /blended learning approach.*

### **7.4 Work-force capabilities addressed**

- *Induction:* All staff are required to undertake induction and although *by the end of the year much of the induction process will be on Moodle* in general a *blended approach is intended.* For example a *practical module, making butter,* so workers can experience the processes involved will continue to be part of the induction process. The company uses Moodle for a number of online courses, currently these have some interactive *modules for users to complete along with a range of documents associated with various subject areas plus, pop-ups, charts and a quiz.*
- *Health and safety:* A lot of time is spent on health and safety issues and the associated training because of the nature of the manufacturing business. The

organisation has developed a *lot of material on the Moodle site to support the training in this area.*

- **Compliance:** The industry must meet the legal obligations and *this is incorporated in the Moodle site.* In general the material currently available *online is mainly compliance stuff, with a focus on health and safety.*
- **ICT skills:** A number of targeted staff receives *some related CBT (computer based training) in a range of software applications used in the normal business operations of the firm but most of this is outsourced to external providers.*
- **Leadership:** The organisation is keen on the provision of *leadership skills especially for managers and supervisors in safe work practices, and off-job practice with assessment.* Although team leader development *is outsourced the trainers use the organisations resources, including Moodle, and customize the training to meet the firms' specific training needs.*
- **Technical and Manual Skills:** The organisation uses *an online critical analysis tool IRR (internal rate of return) to assess whether a (training) project will be viable (cost/benefit analysis). Works well.*
- **Communication and Team Relationships:** Although not specifically targeted *this occurs as a consequence of the training.*

## 7.5 Solutions developed

- **Custom designed:** In general there is a *mix of internal and external creation of resources.* Normally training delivered is *predominantly designed in-house* with the production *outsourced to other companies; it is cheaper to get some of these to create resources.*
- **Scenario based resources:** A resource termed 'learning conversations' has been developed for managers, it is a *scenario based resource, which provides managers with an understanding of why worker is sent to training and how to make sure it is seen as a positive experience for the learner.* This resource is on Moodle with hard copies (DVDs) for managers.
- **Intranet/Internet:** As well as *links to sites from within Moodle and on the company's Intranet to a whole range of things such as how valves work, troubleshooting problems* a number of informational "web-pages" *with the main*

*focus being on mostly leadership issues and associated training are also available.*

- **Learning Management System:** *The organisation is conscious of the need to centralise records which will provide evidence to support training outcomes and it is currently using Moodle to do this, however, this might not always be the case as other alternatives are being explored.*
- **Video Conferencing:** *This organisation is a member of the Corporate Leadership Council an international group where videoconferences are commonly used for training purposes. Leadership is a focus. Since the organisation is an active member of the learning and development round table, Staff are able to observe what other big companies are doing and use the experience as a benchmarking tool. Video conferencing is also used internally to show particular incidents so people are aware of problems and issues and to ensure it doesn't happen again.*
- **Application Sharing:** *This organisation also uses Microsoft Share Group online, to establish Communities of Practice (COP's) globally to exchange ideas and details on work practices.*
- **Interactive Content:** *The firm is about to introduce an operational handbook, hosted online in a Wiki format where information is available on the operation of certain processes, for instance cheese making. This will allow operators to access valuable problem solving information. For example, if one of the 5 cheese making plants breaks down, information on the event and what was done to resolve the breakdown would be entered in the operational handbook; this can then be accessed by others who may wish to use their own experience to contribute to the development of the handbook.*

## **7.6 Delivery**

- **On-the-Job:** *Workplace/on-the-job provision accounts for a significant part of the training particularly in various operator situations. A number of on site operators are also assessors.*
- **Commitment:** *All training is undertaken during staff scheduled working hours with 50 – 100 hours, per staff member allocated for training.*
- **Learning Centres:** *As well as providing training at 26 national sites the organisation is in the process of establishing two dedicated learning centres: This*

*is definitely under way with one site already identified and one other about to be identified.*

- *Registered Provider:* This firm doesn't see the need for it to provide basic computer training. The computer training is outsourced because of the variety of workers, they all need different approaches.
- *Assessment:* Given the nature and range of training facilitated by the organisation a range of assessment procedures are in place. For example, *Online: in Moodle, mainly quizzes.* By portfolio: *the Diploma in manufacturing management which uses a portfolio-based approach (learning diary).*
- *Evaluation:* After the completion of training 'Happy sheets' are summarized to get a national picture for provider management of Unit standards. There are also a number of *online feedback forms.*

## **7.7 Impact**

- *Time:* Using e-learning strategies *makes more sense, it's cheaper, and less time used for workers going to different places for training.*
- *Compliance:* The *useful reporting function* of the LMS used means there is a *Consistent quality of training, better safety records.* There has also been a *reduction in health and safety problems and complaints from customers*
- *People:* The resources *currently on Moodle are on processes, giving a better understanding of how they and the organisation operate* this means employees *have an increased understanding of company strategy and where they fit in.* The organisation has noted there is improved literacy around using computers as a consequence of more use of the online dimension. Although currently there is no evidence of increased staff satisfaction the firm believes this may improve maybe after five years.
- *Quality:* The organisation believes e-learning is a *tool that allows people in remote locations to have quality learning. It's a key ingredient to building a learning organisation.* The initiatives have also meant the *knowledge base of organisational operations has increased.*

## 7.8 Barriers

- *Management Support:* The size of the company can present unique challenges; *because the company is so big, getting senior management support is the biggest challenge; activities at the local level are okay.* In essence, e-learning needs a different style of leadership and the senior managers need to understand how people learn these days and it can take a while to get them to this point.
- *Infrastructure:* Integrating new technologies within the firm can be problematic and currently there are big discussions re integration with the current systems and the updating of systems by the IT department. Because of integration or security issues some software applications are not allowed by the IT department they indicate that Firefox is not allowed on the network, or some systems are not deployed in a timely way Internet Explorer 7.0 has yet to be evaluated. One solution is to outsource some functionality Moodle is currently hosted by the ITO with very few problems with access and use.

## 7.9 Future developments

- *Review:* The training team are aware *it's time to get serious about e-learning* and they have contracted an external agency *to invoke a critical analysis to help develop an e-learning strategy and for the use of Moodle.*
- *New Courses:* *Ten new modules purely on the Dairy Industry;* for example, the nature and function of: a cow, milk, and tankers are being created by an external agency. *These are aimed at building deep dairy knowledge for competitive advantage. These will be ported to Moodle.*
- *Blended:* Although this organisation recognises e-learning is *surprisingly effective, will be preferred in time* in the immediate future training will delivered *through a blended training approach with all learning linked to a competency framework.*

## 7.10 Critical Success Factors

- *Technical:* For e-learning initiatives to be maintained there is a need to employ *technical expert over a long period, not intermittent support provided on a casual basis.* This will enable the firm *to have Moodle hosted internally* reducing reliance on external hosting firms

- *Collaborate:* There is a need for collaboration and cooperation *with good providers* and to help in the *building a network of like minded people* enabling the team to reduce *negativity and have a better focus on what needs to be done.*
- *Communication:* Identify and plan early making sure *you communicate and let others get involved.* Ensure you begin *publishing results for others to review* improving *leadership / management understanding of e-learning is critical.*

## 8. Summary and Conclusions

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### 8.1 Overview

- The Ministry of Education has funded a range of tertiary e-learning research projects to increase the evidence base in tertiary e-learning to support and contribute to its work programme, strategic objectives and stakeholder requirements. This is in response to a number of the objectives outlined in the Tertiary Education Strategy (TES) and the recommendations of subsequent strategies around ICT and e-learning. This study is the third report of the project, *Using e-learning to build workforce capability: A review of activities*, prepared by staff at the Emerging Technologies Centre at Waikato Institute of Technology.
- The structured interviews with managers of the organisations described in these case studies were undertaken between April and August 2008 and provide a “snap-shot in time” of the current use of e-learning by a range of industries in New Zealand.
- For the purpose of this report, **e-learning** refers to the provision, administration and support for ‘off-the-job’ and ‘on-the-job’ training, using information and communication technologies such as stand-alone and networked computers, Internet-based technologies and mobile devices.

### Summary of Key Findings

#### 8.2 Target Audience

- The case studies detailed in this report illustrate e-learning is slowly becoming embedded into the training and educational activities offered across a broad range of industries in New Zealand.
- The e-learning events offered range from the practical, such as electrical generation simulations, to the theoretical, such as certified educational courses in communication.

- From the case studies it is also evident the introduction of e-learning across industry is not constrained by gender, age or level of literacy, with e-learning being offered to male and female, young and old, highly skilled and low skilled and to those with high or low levels of literacy.

### 8.3 Key Drivers for Development.

- *Learning Environment:* With the ever-changing nature of the national and international markets industries are engaging with, technological developments impacting on the production of goods and the provision of services and the growing use of ICT in business processes and procedures, traditional training systems are constantly being reviewed and often found wanting. Increasingly, the targeted use of e-learning is seen as a viable alternative in addressing the training needs of individual industries.
- *Cost:* Business investment decisions on training are driven by return on investment. A key driver for many of the e-learning deployments illustrated in this report is the financial gains generated by the replacement of traditional modes of training with targeted e-learning applications. The ultimate benefits of a skilled workforce also help offset implementation costs.
- *Legal Compliance:* Workers employed in the firms reviewed often need to meet a number of requirements (such as health and safety, site safety, and, in some instances, certification) as a pre-requisite to employment. In some cases, it is also crucial employees are aware of their obligations under Government legislation. The use of e-learning delivery and administrative tools provide the firms with the ability firstly, to monitor workers' current compliance status and ensure they meet them and secondly, to ensure all employees have accessed appropriate information on their obligations.

### 8.4 Work-Force Capabilities Addressed

Given the increasing use of e-learning in industry, the scope of training provision is extremely broad and e-learning solutions have been developed and deployed to address;

- *Induction:* A significant number of the firms reviewed indicated they were using e-learning to introduce staff to the firms' processes, procedures and

requirements. The flexibility provided by e-learning ensures the induction of employees can be undertaken at anytime and anywhere.

- *ICT Skills*: A number of targeted staff receive specific training in the range of software applications acquired by the organisation to undertake and monitor the normal business operations of the firm.
- *Literacy and Numeracy*: Although this area is not specifically targeted by individual firms, many firms address this issue through collaboration with external experts or the promotion of courses from external providers.
- *Technical, Trade and Manual Skills*: In general, participants in this area are used to undertaking training on new devices, technologies, or production methods. The innovative use of e-learning applications such as video-capture technologies, simulations and demonstrations appears to provide a consistency of approach not generally available through traditional methods of delivery. E-learning is being used for both standard and advanced training programmes.
- *Product Knowledge*: To increase market share and/or to ensure staff are aware of the products produced or services offered, some firms provide e-learning solutions to keep staff abreast of latest developments.
- *Certification*: Many firms provide formal recognition of training undertaken (for example, working in confined spaces or first aid) and e-learning administrative tools are used to monitor employee certification status.

## 8.5 e-Learning Solutions Developed

- *Custom Designed*: A range of content creation software applications, such as Articulate, HTML editors and Flash, are used to create custom-designed CDs, DVDs, or web-hosted content. These are generally created in-house to meet the specific training needs of the organisation. In many instances these digital resources are supplemented by digitally created, but print-based, workbooks.
- *Blended*: A number of firms are increasingly using laptops, DVDs and data/video projectors to enhance traditional face-to-face learning environments. The nature of the learning environments is changing with the flexibility of the technology being used. In many cases, learning events can and are being created 'out in the field'.

- *Simulations*: Simulations form a significant component of e-teaching solutions developed. In general, they are designed to replicate firm-specific, problem solving situations, ensuring the workers are up-to-date and competent with equipment functionality.
- *Intranet/Internet*: A number of informational “web-pages”, outlining product functionalities and specifications, are readily available to all employees. Other Web resources include tracking systems, email, links to external information, numeracy and literacy resources and custom-designed interactive courses.
- *Learning Management Systems*: A number of firms are introducing Learning Management Systems (LMS) as these systems provide the organisation with the ability to maintain individual learning plans and to book, track and record training activities.
- *Video Capture*: Although not wide-spread the provision of videos, often enhanced with notes and interactive graphics, of external experts installing new plant and/or operating machinery, has been found to be very effective for skills acquisition or maintenance.
- *Mobile*: Although some firms have found the use of mobile devices problematic, the increasing use of mobile devices by all sectors of society has seen firms begin investigating the benefits of using these devices for training /educational purposes.

## 8.6 Delivery

- *On-the-Job*: Workplace/on-the-job provision accounts for a significant component of the training offered by firms and, in some cases, between eighty and ninety percent of training is provided through this approach.
- *Commitment*: Employees generally undertake the training at their place of work and have reasonable access to the necessary ICT equipment. This reduces time of task and increases profitability.
- *Assessment*: Workplace/on-the-job training is assessed by an on-the-job ‘mentor’ and certified assessors. A number of the compulsory induction / site safety online modules developed have mandatory assessments included. Employees must pass all these assessments before the course is considered to be completed and they are compliant with the identified requirements.

- *Evaluation:* In general, all training events are evaluated with firms using standard rating evaluation forms. These evaluation forms are collated and any concerns/issues are addressed.
- *Computer Based:* CDs and DVDS are used extensively across all case study participants to demonstrate products, principles, procedures and practices. These are often multi-media rich resources including animations, audio and video files.
- *Internet:* Interactive Web tools (such as discussion boards, e-mail) are sometimes used as a part of a framework of support for the e-learning activities and as storage area for supplementary resources used in face-to-face teaching sessions.
- *Simulators:* A number of industries use a range of demonstrator simulations. Some are very sophisticated and are based on the actual machines and operating systems employees use.

## 8.7 Impact

- *People:* It was noted in these studies there was an increased number of staff who have moved from low skill to higher level skills. There also appears to have been improved collaboration, communication and teamwork within the organisation.
- *Production:* Organisations have found the growing use of e-learning applications is improving speed of learning/training and reducing employee down-time. Anecdotal comments also indicated improvement in the service provided to the customer and safer working environments created.
- *Quality:* e-learning is seen as a vehicle for improving the consistent quality of training which is essential to increase the knowledge and skill levels of employees. E-learning also ensures training events are no longer 'one off' training sessions and employees can go back to the online resources at anytime reinforcing the learning that has taken place.
- *Compliance:* The strong management capability of the e-administration tools ensures that compliance and knowledge of the workforce is audited, tracked and managed effectively. This enables firms to meet all legislative requirements.

- *Time*: The initial findings from the case studies indicate the e-learning dimension provides both greater speed and more flexibility for the learner. This flexibility also means the training can be tailored to be least disruptive to a firm's work schedules and there is less time "off-the-job".

## 8.8 Barriers

- *Financial*: For all organisations, a critical issue is the perceived cost of e-learning implementation versus the investment and time out for the business. In essence, e-learning solutions need to be cost effective and, until they have been deployed, it is difficult to argue the financial benefits.
- *Management Support*: Traditional approaches to training are well known and accepted and it can be challenging to get the 'traditionalists' to adopt the new approaches. This resistance can be overcome if there is ongoing, demonstrated support from senior management.
- *Relevance and Quality*: Organisations recognise materials presented to employees must be relevant and authentic. However, this creates tensions as producing digital materials, especially high quality videos, can be very expensive and not be necessarily suited to budget constraints.
- *Acceptance*: Online learning is relatively new to many in the industry and this is evidenced by the reluctance from some employees to fully engage in the courses offered. However, as more courses are offered through this medium it is anticipated this reluctance to engage will diminish.
- *Recognition*: The relative newness of e-learning has triggered reluctance by some authorities to accept that e-learning is an acceptable mode to deliver training and conduct assessments. However, as more e-systems, e-processes and e-assessments are deployed it is anticipated such hesitation will diminish.
- *Infrastructure*: The infrastructure needed for ongoing development of e-learning initiatives carries costs both from the identification of appropriate emerging technologies to deploy and associated financing of such deployments.

## 8.9 Future Developments

- *Blended*: Although within organisations there is a growing focus on e-learning, it is recognised traditional approaches remain important and significant training will continue to be offered via traditional methods. A blended approach, incorporating e-learning with traditional formats has already been identified by some as the way to proceed. It is envisaged that this will be a significant approach in the future.
- *Collaborative*: To achieve cost reduction and to increase the quality of resources developed, many organisations are aware of the benefits and savings to be gained by working with the producers of the goods they sell and with other organisations in the same sector.
- *In-House*: Increasingly, organisations see the benefits in tracking the training undertaken by employees, ensuring all employees are conversant with company policies and compliant with appropriate legislative requirements. This will be monitored by e-administration tools managed by in-house staff.
- *Mobile*: Mobile technologies (such as phones, PDAs and cameras) are becoming readily available and enable information to be accessed remotely and for data transfer from those 'on-site' back to the central office and conversely for the central office to provide advice or training to those 'on-site'. A number of firms indicated in this study that the use of mobile technologies was a key component of future e-learning offerings.

## 8.10 Critical Success Factors

- *Planning*: While e-learning can be effective in a range of situations, organisations need to be clear in their expectations of how e-learning will meet their specific training needs.
- *Senior Management Support*: Support from senior management is essential for the successful implementation of e-learning. To obtain this support, advocates of e-learning need to justify the costs associated with developing e-learning materials and deploying e-learning solutions.
- *Technical*: It is important, when firms select an e-learning solution, that this solution is able to meet future demands and can be integrated smoothly with existing and planned systems. Failure to do this will add additional and unforeseen expenses and delays to e-learning development.

- *Awareness*: When contemplating a change from traditional modes to online learning, organisations need to be aware of potential resistance to change and articulate a clear vision and solicit feedback from employees on the efficacy of the e-learning for them.
- *Evaluation*: To help embed e-learning within an organisation, feedback from users of the e-solution needs to be regularly obtained and the financial costs must be monitored. This will help to demonstrate the cost effectiveness and acceptance of the e-learning solutions developed.
- *Collaborate*: Collaboration and cooperation with other similar organisations will serve to establish universally-accepted practice, standards and training which will ensure the skill set of the workers is comparable and transferable across sectors.

## Conclusions

**8.11** Industries in New Zealand are slowly acquiring the necessary skills and operational experience in the deployment and implementation of e-learning systems, applications and content.

**8.12** The focus of many debates on e-learning in industry is centred on organisational expectations, the potential financial benefits accrued, the impact of e-learning on improving workforce capability and the use of e-learning to ensure firms fully comply with legislation.

**8.13** Currently a number of industries, across all sectors, have in place a sufficiently robust and extensible information and communication technology infrastructure to facilitate any e-learning initiatives that they wish to implement.

**8.14** During the review of the case studies, four emergent themes in e-learning in industry were identified:

- *Awareness*: The raising of awareness of both management and general employees on the use and benefits of employing e-learning solutions is a key driver for their active commitment to, and participation, in e-learning initiatives.
- *Compliance*: There is a growing acceptance e-learning solutions can provide organisations with a flexible online system which allows them to record and track the legal compliance status of their employees and enable them to deliver courses that ensure employee certification for compliance is current.

- *Strategic Planning*: The development and implementation of e-learning plans must be an integral part of the development of the organisation's broader training plans.
- *Quality of Training*: The quality of the e-learning experience participants enjoy can be directly attributed to the quality of all the processes and procedures used in the creation of the e-learning event.

**8.15** In the creation and deployment of e-learning solutions, organisations appear to follow a recognized cyclical pattern conceptualised by the research team as the Five Ds (5Ds) of e-learning. *Define*: the e-learning requirement, *Design*: the e-learning experience, *Develop*: the e-learning resources, *Deliver* the e-learning event, *Determine*: the success of the e-learning experience. The 5Ds of e-learning are illustrated in figure 8.1 below:

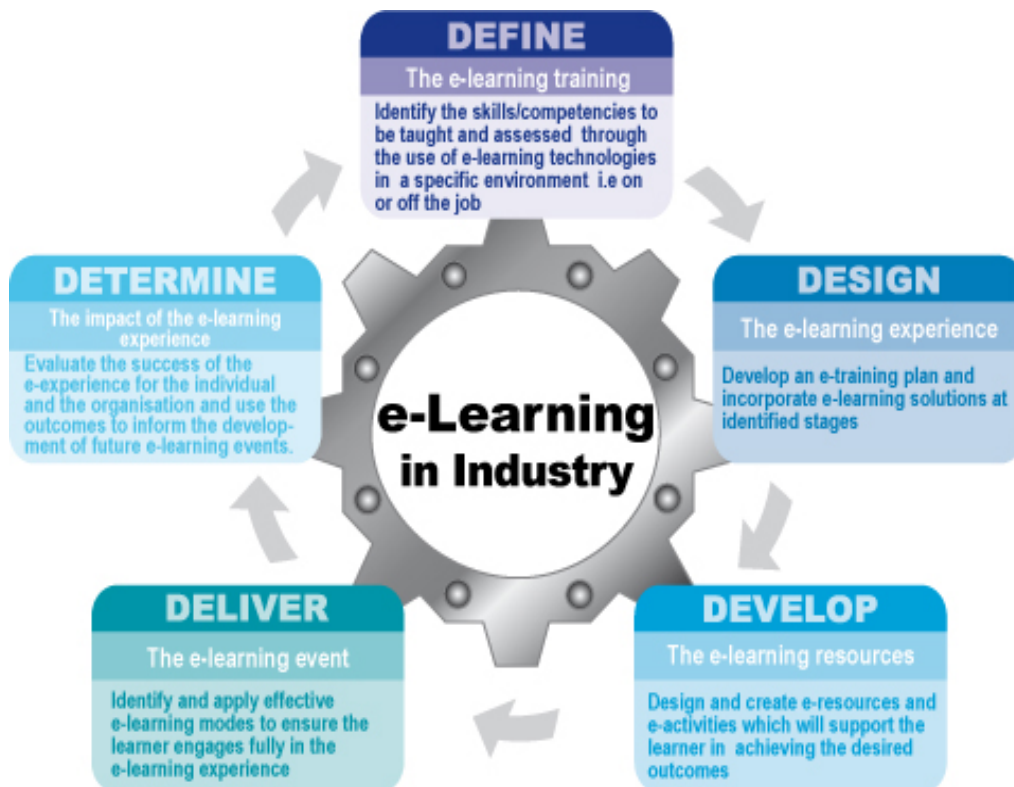


Figure 8.1: 5Ds of e-learning

**8.16** From the case studies it was noted the critical success factors identified for the introduction of e-learning were often dependent on the size of the organisation and the potential resources (financial, physical and human) available to the enterprise for the introduction of e-learning initiatives.

8.17 The success factors noted for the implementation of successful e-learning in small and medium sized enterprises are illustrated in figure 8.2 below.

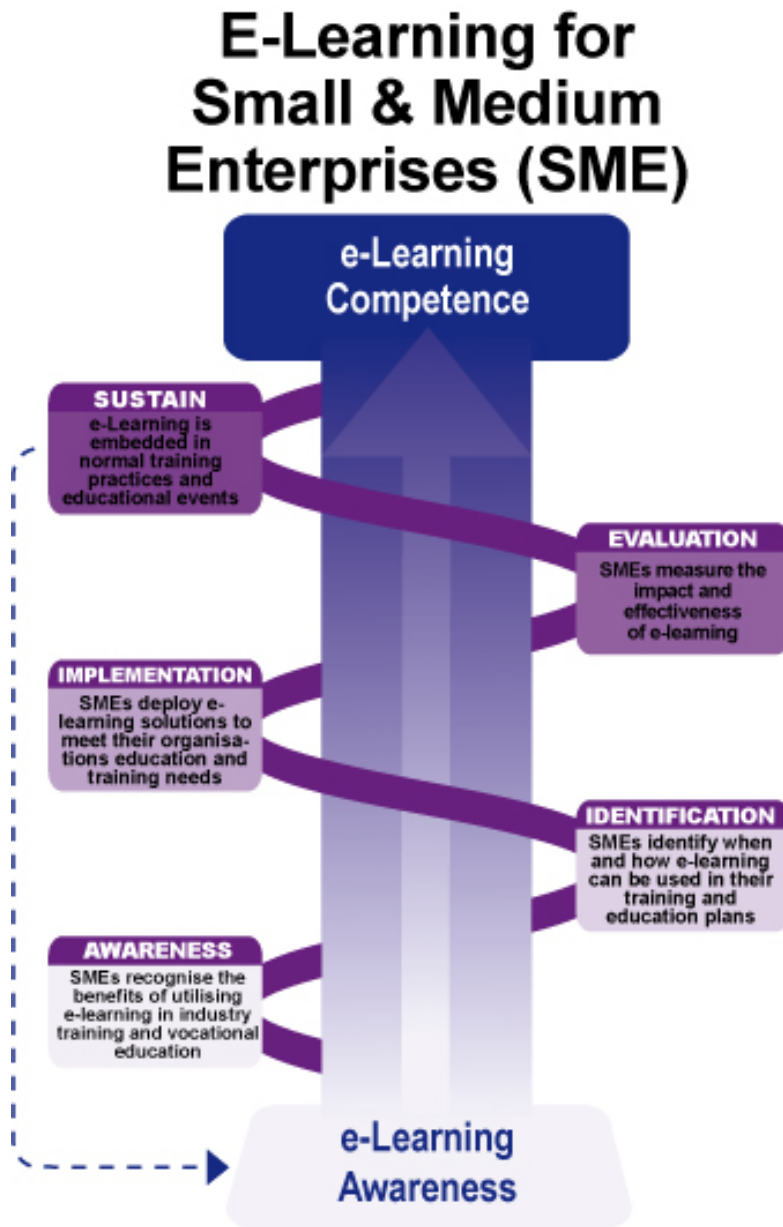


Figure 8.2: e-learning in small and medium enterprises

8.18 The success factors noted for the implementation of successful e-learning in large enterprises are illustrated in figure 8.3 below.

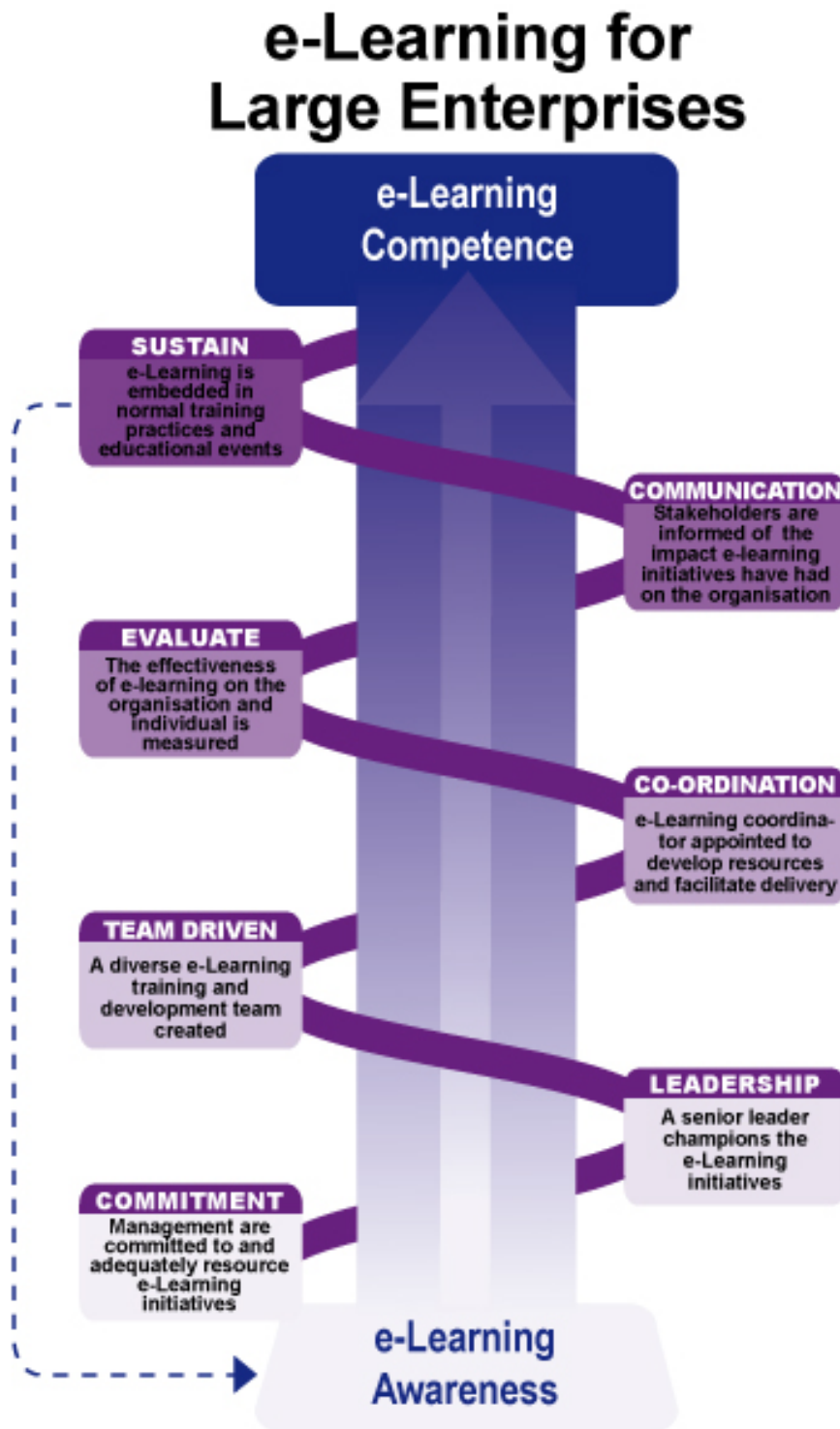


Figure 8.3: e-learning in large enterprises

## Summary

**8.19** In the next three to five years there will be a steady, but notable, increase in the use of e-learning functionality to enhance and expand traditional training methods in industries in New Zealand; a blended approach is the preferred option for the majority of training programmes. The e-learning functionalities deployed will include, but will not be limited to,

- An increase in the use of e-administration tools to monitor and report on workplace or work-based training events offered by individual industries.
- Increasing electronic access for trainees to visually appealing, work-place relevant, interactive digital course materials accessible anytime, anywhere.
- Increasing remote access for employees to organisational procedures, operational best practice videos and records of learning through mobile devices.
- Integrating all training through a web-space to ensure consistency of delivery, plus transparency, currency and accuracy of the policies, procedures and legal obligations of an organisation.
- The employment of e-portfolios, which enable the organisation, trainer and the employee to track and manage training needs.

## 9. Appendices

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### 9.1 Appendix 1: Case Study Template

Case Study Title: \_\_\_\_\_

#### 1 Background

Organisation Profiled	Will be confidential
Industry Sector	
Industry Size	
Industry main location	
Topic	
Date deployed	

#### 2. Target audience and key drivers for development.

This programme was developed for (all employees, contractors, senior management, technical training .....)

The reasons for developing were (Costs, flexibility, time .... ....)

#### 3. Work-force capabilities addressed

The training was developed to address/improve skills in

- Communication, Team relationships ....
- Health and safety ....
- ICT skills, Software applications .....
- Literacy, numeracy ...
- Induction ....
- Legal Compliance .....
- Trade, Technical, Manual skills .....
- Obtaining certification, practising certificate
- Other ... ..

#### 4. e-learning application / ICT solution developed

What resources were/are used for the training/education initiatives

For example content

- Off the shelf content
- Flash Application
- Web-pages

- Computer game / simulation
- Custom designed

For example delivery

- CDs DVDS
- Internet / ICT Web tools
- Learning management system
- Mobile
- Integrated Workbooks
- Seminars/tutorials/demonstrations
- Simulations

For example devices

- PCs /Laptops
- Mobile
- Videoconferencing
- Other

## 5. Delivery

What mechanisms were used in the initiative

For example the training programme involved

- % self paced e-learning
- At a registered provider
- On the Job
- At home
- At a dedicated learning centre
- Distributed locations

The programme was assessed by/through

- Online
- At a registered provider
- By an assessor
- Worksheets / work books
- By portfolio
- Self assessment

The programme had the following support systems in place

- Student/trainee mentoring
- Online support
- Offline support
- Trainer support

- Mechanism for feedback

## 6. Participants

How many participated .....

What "level" were they at (literacy numeracy ... .. )

Male / female    Age group

What types of training had they experienced in the past

What feedback was obtained on the nature of the programme (support, value to them ... ..),

What level of commitment was required (time, at home, at work ... )

Did all participants have ready access to appropriate technologies (at home, at work ...)

## 7. Impact on building workforce capability

People moved from .... To .....

Production increased .....

Production line stoppages decreased

Quality improved .....

Knowledge base of organisational operations increased

Increased competitive advantage through highly skilled workforce

Improved collaboration, communication, teamwork in the organisation

Measured by .....

## 8. The benefits of the deployment

This initiative enabled

- Faster learning, better results than previous methods, provided greater flexibility (any time anywhere) .....
- Evidence of outcome (If available ... .. )
- Less off-the-job / production stoppages, Consistent quality of training, Better safety records
- Evidence of outcome (If available ... .. )

- Increased number of skilled staff, motivation, improved literacy  
... ..  
Evidence of outcome (If available ... .. )
- Staff retention through increased work satisfaction and career support  
Evidence of outcome (If available ... .. )

## 9. Barriers faced and addressed

The main barriers to implementation of the training programme(s):

- The challenge (cost, non-compliance ... ..  
The was/will be addressed by (if available ...)
- The challenge (leadership / management ... ..  
The was/will be addressed by (if available ...)
- The challenge (Motivation, staff resistance ... ..  
The was/will be addressed by (if available ...)
- The challenge (access to technology and support ...  
The was/will be addressed by (if available ...)

## 10. Future

Where to now .....

Would you continue to do what you are doing? Because?

Would you contemplate introducing similar initiatives? Why?

What will training provided by the firm be like in 5 years ...

## 11. Advice for others

What would you advise others to do (critical factors)

- Resourcing
- Leadership support
- Planning
- Staff ongoing PD
- Trainee ICT profile
- Trainee support
- Publishing results for others to review

## 12. Summary

- What do you think of e-learning now
- What is different from when you started
- What was the major finding / feeling after the event

## 9.2 Appendix 2: Glossary of Terms

Term	Definition
Blended Learning	A design approach thoughtfully combining traditional methods to on-the-job and off-the-job training with e-learning applications.
Computer-Based Training	An electronic self-paced learning activity. Media-Rich content and learning activities are generally stored on a CD-Rom, DVD or memory stick.
Distributed learning	A student-centred approach to learning that incorporates the use of technology in the learning process.
e-learning	In this report e-learning refers to the provision, administration and support for 'off-the-job' and 'on-the-job' training using information and communication technologies such as stand-alone and networked computers, Internet-based technologies and mobile devices.
Flexible learning	The provision of a range of learning modes or methods, giving learners greater choice of when, where and how they learn.
Off-the-job learning	For the purpose of this research project, off-the-job learning refers to authentic, evidence-based learning activities and tasks designed and provided for workers at locations other than their normal place of work. Off-the-job learning resources are normally designed in context with the worker's current working practices. This is also known as "work-based" learning.
Online learning	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.
On-the-job learning	On-the-job learning is structured learning that occurs within the learner's normal working environment. This is also known as <i>work-place</i> learning.
Web-tools	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.
Web-space	The provision of access to a range of materials and resources on the Web that are specific to a particular discipline or organisation.