E-Learning and the Changing Face of Corporate Training and Development

Max Zornada

> As much as ERP is critical to a manufacturing supply chain environment, e-learning is critical in a knowledge dependent supply chain environment.
>
> Larry Pereira, Motorola

Internet technologies and the advent of e-learning applications in many organisations have made a fundamental difference to the way organisations deliver training and development content, activities and experiences to their employees. Some of the organisations at the forefront of deploying e-learning technologies have been global corporations and/or transaction processing intensive organisations, who typically have difficulties assembling their staff for traditional classroom based training activities, either due to logistical difficulties or because of the impact this would have on work flows and business continuity. Such organisations have developed approaches to e-learning and competency development that overcome the logistical problems of conventional training by making innovative use of e-learning. This paper examines the approaches used by several leading global, Australian and Asian organisations, including Cisco Systems, Motorola, Qantas and several others by drawing on a field study conducted by the writer during 2003–2004. It attempts to identify some key emerging trends and practices in the field, and lessons that can be learnt from the experiences of organisations reviewed, for the successful deployment of e-learning strategies.

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Introduction

Since widespread internet access became available during the early to mid 1990's, business has looked for opportunities to harness this new technology for its benefit.

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This paper presents and discusses the results of the writer's field based review of how several major corporations in Australia and in the Asia Pacific region more broadly are applying e-learning technologies to support the implementation of their training and development strategies. The applications observed and discussed range from the tentative first steps to make a single topic module available for study on the corporate intranet, through to sophisticated corporation wide learning and content management systems (lcms) deployed by Cisco and Motorola which are indicative of the substantial commitment to e-learning being made by these organisations.

Methodology and Approach

The findings and cases presented and discussed in this paper are based on a combination of:

- Field based interviews of managers at the organisations reviewed and review of e-learning practices.
- Information drawn from research reports into e-learning submitted by managers at some of the featured organisations, submitted as part of the assessment requirements for the writer's e-business mba subject in which these managers were students, in Adelaide, Hong Kong and Singapore.
- Desk based review of published literature in this field.

Companies specifically referred to and included within the scope of this study include, Westpac Banking Corporation, Qantas Airways of Australia, Motorola, Cisco Systems Asia Pacific and the University of Adelaide.

The First Small Steps Towards E-Learning

The experiences of a major Australian bank, Westpac, are typical of the first steps to e-learning taken by many organisations.[1] During the late 1990's the Australian Government introduced changes to legislation affecting the granting of credit. This was known as the Uniform Credit Code (ucc). The impact of the legislative changes was that all staff involved in any aspect of decision making concerning credit were required to be familiar with the legislation and were required to make decisions in a manner consistent with the legislation. In the bank's Home Mortgage Processing operations, almost all employees were affected by this legislation to some extent and would need thorough training to familiarise

themselves with the details and how it affected their work decisions. This created the need to train and update thousands of employees.

The approach used by most financial institutions including Westpac initially, was to develop a class room based training program that all employees were required to attend. The class room training concluded with an exam and only employees passing the exam were accredited to be allocated to roles affected by the ucc.

The key problem with this approach related to the fact that the majority of staff would only use the knowledge gained on an ad hoc basis due to the normal variations in the flow of work and personnel allocations. This meant that enough time could pass between successive occasions when staff would be called upon to apply the knowledge learned in the class room, that there was ample time to forget and make errors. This represented an unacceptable risk to the bank. Other problematic issues included:

- Orientation and training of new employees. The need to establish a 'critical mass' of new employees in order to make the classroom-based training viable meant that there could often be a significant lead time from when employees joined to when they received the required training in the ucc. This severely restricted the range of tasks employees could be asked to perform and restricted management's ability to manage workloads and service levels.

- The legislation itself was also subject to change over time. Facilitating shorter follow-up workshops such as the initial classroom-based program to brief staff on changes, everytime a change happened was seen as undesirable because of the large number of employees affected and the consequent disruption this would cause to operations.

This is an example of Regulation-Driven Demand (Barron 2002), an area in which Barron's research suggests there are significant opportunities for e-learning based applications.

In Westpac's case, the solution came in the form of an online system delivered through the desktop on the bank's organisation wide intranet. The functionality built into the online system addressed many of the problem issues previously mentioned. The online system was offered as an option to attending the classroom-based training.

A new employee could work through a series of 'programmed learning' style modules delivered to the desktop. Employees could work

through these at their own pace and spread them out over several sessions without leaving their workstation. In this manner, employees could often exploit quiet periods during the working day in order to complete individual modules without being absent and effectively unavailable for work for the entire training day, as they would have if they had attended a classroom-based session. This feature gave the team leaders the ability to schedule required training modules into normal working days by taking advantage of naturally occurring periods when workloads were lower, while still having team members available at their desks to cope with periods when workloads were high.

Each module featured an online test which gave the employee immediate feedback on performance. Upon completion, the final accreditation exam was delivered and assessed on line. The employee's final result was automatically recorded in the Human Resource Management system, and if they had not achieved a sufficient level of proficiency this would automatically be flagged when their team leader made work allocations. Employees could repeat the training and the exam as often as they liked, until they passed the exam. The online system also kept track of when each employee had last been accredited and at predetermined intervals would flag the need to re-accredit. This was particularly important for employees who only used these skills on an ad-hoc basis and might forget some of the content between subsequent applications. Once flagged, employees had a set amount of time to re-accredit, otherwise their UCC status would be suspended. The re-accreditation exam was delivered online with immediate feedback of results. If the employee did not achieve re-accreditation the system would flag their unavailability for tasks requiring accreditation until such time as they successfully re-accredited. All results and details of training completed were updated on their employee file, and impacted on the range of tasks they could be assigned to do.

The e-learning module provided an effective vehicle for the delivery of training activities. However, by linking the assessment process to the Human Resources database, the e-learning system supported processing quality by ensuring that only qualified and accredited employees were assignment to tasks requiring those skills and that the need for ongoing maintenance of critical competencies was efficiently met.

Qantas Airways of Australia, Australia's national airline, similarly were an early mover into e-learning. Qantas has a workforce of some 30,000 employees, with approximately 18,000 employed in Sydney, Australia, the

remainder deployed around the world. A major barrier to training for an international airline like Qantas are the impacts and difficulties of getting a critical mass of employees in one location at one time for conventional classroom-based training. Not only is there the cost impact of releasing personnel from the workplace to attend training, there are also the cost impacts and logistical difficulties associated with a global workforce which is constantly on the move.

As early as 1995, Qantas commenced work with an Adelaide based solutions development company, TechWorks, to investigate the potential of e-learning to meet their needs.[2] Although starting as a relatively simple system implemented as a vehicle for updating its globally dispersed workforce on company policies and procedures, the Qantas e-learning platform (currently managed by Hudson Learning Solutions), very quickly grew into Qantas College Online.

Qantas College Online won the prestigious ANTA Australian Training Award in 2001 and was finalist in the 1997 Australian Technology Awards (see www.learning.hudson.com). Qantas College Online is accessible to any Qantas employee anywhere in the world at any time, and now has more than 10,000 registered learners (Hudson Learning 2004). The system routinely tracks learner progress, assessment and accreditation.

What is E-Learning

The previous two companies examined, document the implementation of e-learning in their respective corporate environments.

Although the term e-learning can be applied to a broad range of technology supported learning approaches, for the purposes of this paper, the term e-learning will be used to refer to the more contemporary approaches. In particular, approaches that make use of Web-based systems and Learning and Content Management Systems for making training and development activities available on the desktop using intranet or internet based platforms. This includes:

- Synchronous (instructor led or mentored) programs, where the learner follows an instructor determined schedule and interacts with the instructor during the course of study using email, chat technology or forums – also referred to as 'blended' learning when coupled with class room based activities.
- Asynchronous (individual/self paced) programs, which the learner progresses through independently and at his/her own pace.

Let us now consider how a large technology savvy organisation might go about rolling out an e-learning strategy and consider the case of Motorola.

Motorola

As might be expected from a company that regards itself as at the forefront of information technology, Motorola has made the internet a key element of its information technology infrastructure.

Since 1997 is has progressively migrated most of its management and employee transactions from paper based systems to online b2e (Business-to-Employee) portals (Pereira 2004). This includes portals such as:

- my.mot.com, a personalised business information portal,
- myhr.mot.com, a human resource processes portal,
- pm.mot.com, employee performance management systems portal,
- enet.mot.com, an employee database portal,
- travel.mot.com, a travel information portal,
- mu.mot.com, an e-learning portal.

This network of portals, illustrated in fig. 1, is used by managers and employees on a daily basis and can be accessed from the desktop at work, home or while travelling.

We will discuss the e-learning portal in more detail and the way it implements Motorola's E-Learning strategy.

E-LEARNING @ MOTOROLA

Motorola University (mu) is the foundation on which employee learning and education is built at Motorola. mu has a global presence with a charter to implement Motorola's Learning Policy.

The business impact of the internet led Motorola University to establish an e-learning group in October 2000 as an incubator for Motorola's entry into large scale e-learning. The e-learning organisation was initiated to be the premier destination for e-learning services and as an aggregator for designing, collecting and delivering e-learning solutions to Motorola employees.

Industry studies in 2000 showed that Returns On Investment of between $3 and $33 saved for every $1 spent could be realised by the effective use of E-Learning (Whalen and Wright 2000).

finance.mot.com	enet.mot.com
• Finance policies	• Employee information
• Department expenses	• Rewards planning
• E-procurement	• Organisation structure
	• Recruitment

my.mot.com	myhr.mot.com	pm.mot.com
• Business/tech news	• Policies, benefits	• Performance
• Stock watch	• Career planning	management system
• Google search	• Work/life balance	• Employee goal tracking

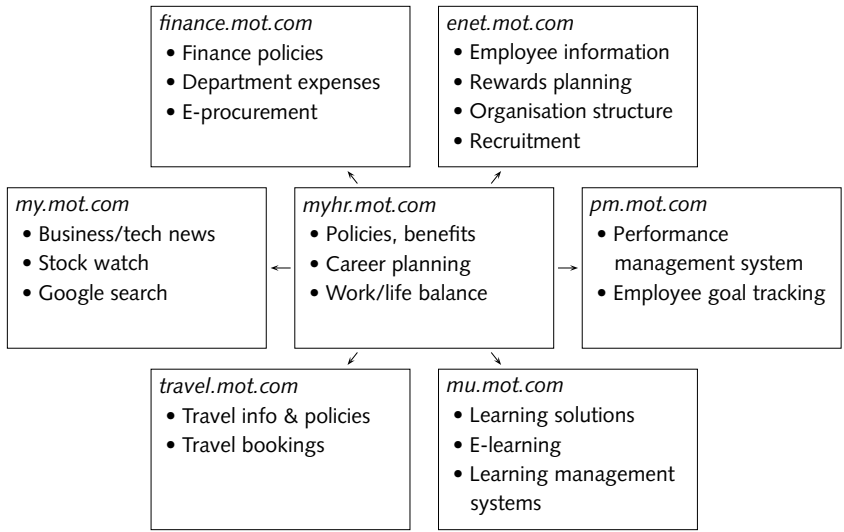| travel.mot.com	mu.mot.com
• Travel info & policies	• Learning solutions
• Travel bookings	• E-learning
	• Learning management
	systems

FIGURE 1   Motorola's B2E portal network (not exhaustive)

MU set a goal of 30% of delivered training to be done online in 2001, increasing to 50% by 2003. While initially targeted at Motorola employees, its longer term strategy is to include suppliers, channel partners and customers (E-Learning Strategic Plan 2001).

The E-Learning process steps supported by the MU e-learning portal are illustrated in fig. 2 in the form of an 'egg-diagram' – a technique proposed by Rayport and Jaworski (2002) for mapping out the decision processes and functionality of online systems.

As illustrated by the Egg Diagram, the e-learning portal offers a complete Learning Management System providing employees access to a total learning solution for online or instructor led courses. The system maintains a list of courses taken by an employee and through the Learning Plan provides the capability of identifying gaps in an employee's skills. It can then register the employee for courses to fill skills gaps. Skills assessments are done through the Performance Management system and are initiated after dialog between an employee and their manager.

The e-learning portal caters for the delivery of synchronous (instructor led or mentored) programs or asynchronous (individual/self paced) programs and registration for class room based training.

The overall process supported by the Motorola e-learning systems can be depicted as an 'E-Learning Value Chain', shown in fig. 3.

Request for credit	Identify skills gap and
• Request for credit after completion of course • List credits for course taken	training requirements • Access and update performance/learning plan • Review training plan summary • Review on-line enrolments for oneself and direct reports

On-line training process

Take course and self test (if applicable)	Check online course availability
• 3-month window to take on-line course • Initiative in-line course • Await CD-ROM shipment • Take test after each module	• Search for course delivery mode, language, region • List details of course, price, schedule and location

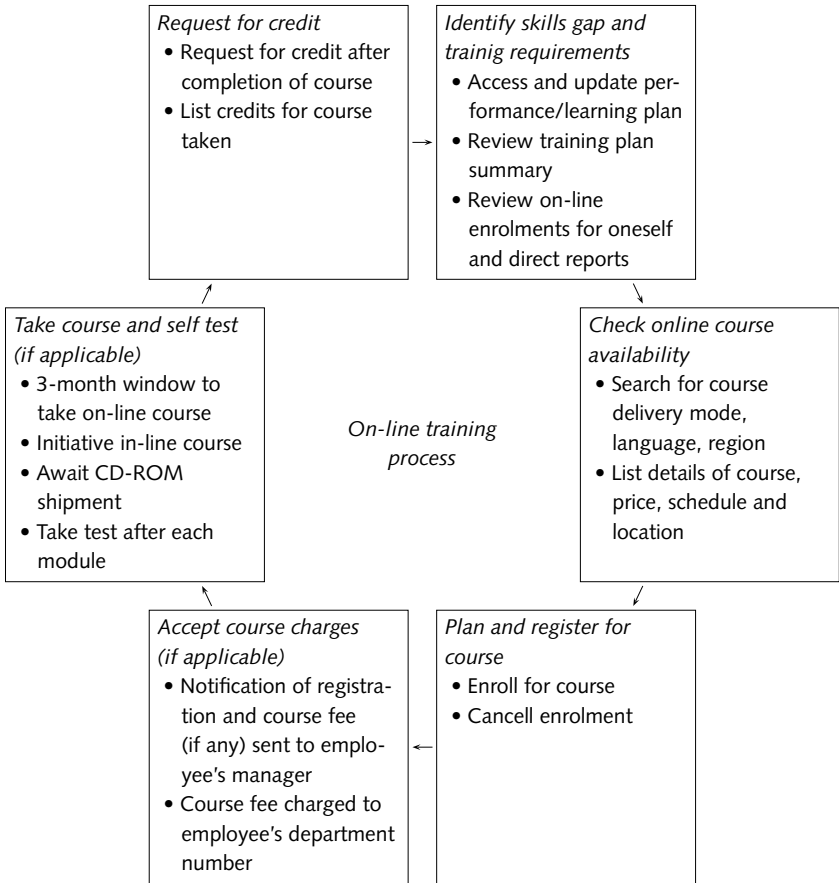| Accept course charges (if applicable)	Plan and register for course
• Notification of registration and course fee (if any) sent to employee's manager • Course fee charged to employee's department number	• Enroll for course • Cancell enrolment

FIGURE 2   Diagram of decision process of online course enrolment

The e-learning Value Chain, as Motorola have called it, is in effect, what e-learning platform providers would refer to as a Learning and Content Management System or LCMS. The process commences with the business needs and skills assessment. The learner accesses the learning portal, which through the learning delivery server gives access to the content database. This includes internally developed and externally developed licensed content.

The learning management server provides access to learning process management resources. Details of the learner and programs completed are tracked in the student database.

The participant environment in which the program is delivered can be at the desktop for purely online components, Learning Resources Cen-
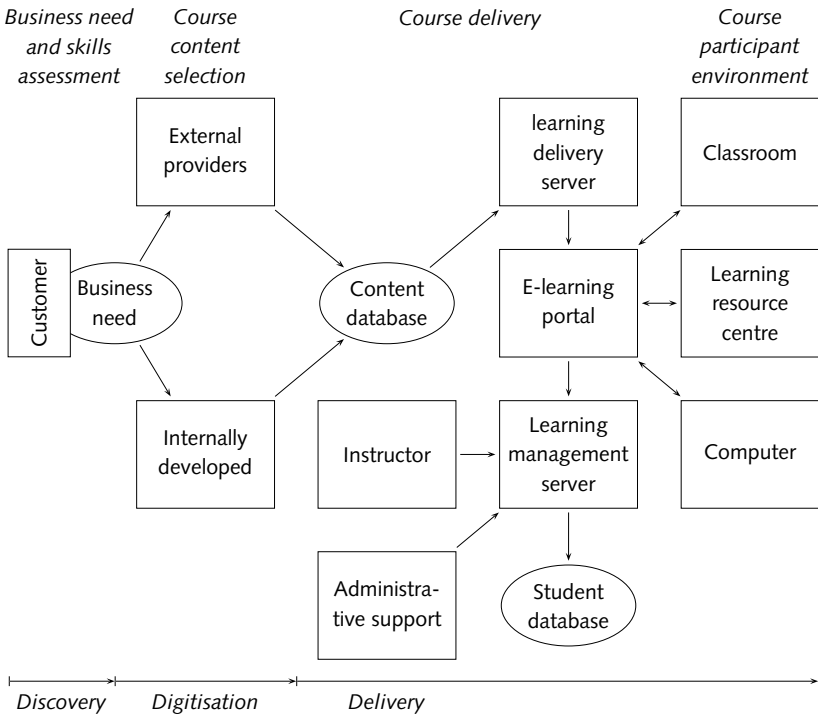
Business need and skills assessment | Course content selection | Course delivery | Course participant environment

Customer | Business need | External providers | Content database | learning delivery server | Classroom | E-learning portal | Learning resource centre | Internally developed | Instructor | Learning management server | Computer | Administrative support | Student database

Discovery | Digitisation | Delivery

FIGURE 3   The Motorola e-learning value chain

tres (state of the art facilities dedicated to multiple learning categories located at major Motorola facilities) or classroom-based.

Some of the key benefits stated by Motorola employees and managers include the access to a wide variety of courses, around the clock, at any location and at a lower price.

Cisco Systems

Apart from technology and product leadership, Cisco aims to be recognised as a forerunner in how future business will be run. The company's Networked Virtual Organisation (nvo) is the showcase for using the Internet to provide customer support, sell products, offer training, and manage finances (Heng 2003).

Internally, the role of the intranet is critical. Cisco regards its intranet and the applications deployed through the intranet as a key enabler of workforce optimisation (Nolan, Porter, and Akers 2001). A key application is that of e-learning. E-learning modules are available to employees directly on the desktop.

The use of the modules as well as information about their effectiveness is tracked to determine the extent of use. From the tracking information, the quality and effectiveness of the modules can be assessed as the needs of the organisation change over time.

Heng (2003) of Cisco Systems Asia Pacific, Singapore states: 'Training – Cisco stays competitive by responding effectively to change. They ensure that their employees can quickly learn new skills, update old skills, and assimilate vast amounts of information about new products, markets, and the competition. E-learning is a revolutionary way to empower a workforce with the skills and knowledge it needs to keep pace with a rapidly changing market. The people, companies, and countries with the greatest knowledge, skills, and ability to efficiently create and share information are most likely to succeed in the knowledge-based economy'.

Cisco have also pushed ahead with the use of their e-learning platform as a vehicle for training vendor partners as well as their own staff. An example of this is Cisco System's Account Manager Learning Environment (AMLE) e-learning initiative (Cisco 2003). This system provides Account Managers with online learning resources to improve their professional effectiveness. The courses which make up AMLE are targeted at Cisco's own 5,000 internal account managers and 2,000 external channel partners located in 60 countries around the world. Account Managers can access the AMLE through the learning portal, where they can select from a range of delivery options – online or offline with a web based lesson, a downloadable paper based booklet, with interactive sales scenarios. When they have finished a program they can complete the mastery assessment.

A key part of Cisco's approach is the identification and development of 're-usable learning objects' RLO's which are modularised pieces of learning content whose value can be leveraged across other modules and courses.

The E-Learning Advantage

COST BENEFITS

The cost advantages of e-learning were identified by Periera (2004) as being predominantly in the area of cost avoidance.

By transitioning what was traditionally run as a class room based seminar onto an online e-learning environment, many costs usually associated with training can be avoided. Avoided costs included:

- Accommodation costs for staff who have travelled to the training venue.
- Travelling costs associated with travelling to the training venue.
- The cost of the training venue (room hire).
- Instructor costs.

This is supported by the work of Hall who suggests that the costs of travel and entertainment can be reduced by 50% and Hemphill who quotes a more aggressive 80% reduction reported by THINKQ (2004).

A summary of Cisco's cost-benefit analysis for their AMLE system is as follows:

Users of the AMLE platform reported that before its introduction, an average of two hours a week was spent gathering knowledge required to perform their duties. The online course reduced this by an average of 40%. In addition, the online training reduced the time required to gain technical competency in the selected areas, and knowledge acquisition was reported to be from 40–80% faster than without the AMLE system.

The research time savings alone translate into $511,000 saving per week across the enterprise team. The cost of delivering a full suite of courses to a learner is estimated at $1,000 per person.

In another example, Cisco replaced a classroom-only course with a blended learning course on Interorganisational Information Systems (IOS). Savings in travel, accommodation and lost productivity amounted to approximately $1.2 Million per annum for a program that is offered twice a month to 40 participants at a time.

Both Cisco and Motorola report that costs to set up an effective e-learning system are initially high, but delivery costs are low, offering excellent scale economies.

This made them ideal for situations where large numbers of employees needed to be trained, or where there was a need to offer a course on a frequent basis. Examples of what Barron (2002) calls Certification Driven Demand and Training Intensity Driven demand training markets.

PRODUCTIVITY AND ORGANISATIONAL BENEFITS

The results of other studies in the field of computer based and multimedia based training, summarised by THINKQ (2004) suggest that the key advantages of e-learning should be:

- Less time taken without diminishing learning benefits.
- Time away from work is reduced.

- Better meets the needs of a geographically dispersed workforce.
- Course delivery is more consistent.
- Instruction can be better tailored to individual learners.
- More cost effective.

The experience of Westpac, Qantas, Motorola, Cisco Systems reviewed as part of this study and discussed in this paper, as well as the experience of the University of Adelaide in general support the above views. However, the experiences of the organisations reviewed can further lead us to make more specific statements regarding benefits.

E-learning led to a sustained and deeper level of understanding of the program content by learners, particularly in the case of Westpac where employees were required to re-accredit on a regular basis. This translated into higher work quality (less errors and less risk of non-compliant decisions) and higher worker productivity levels.

Higher productivity levels were experienced in more general terms, not just as a result of less errors and better decisions. This was attributed to several sources. The option of taking a course online, particularly one for which the skills and knowledge could be immediately applied to give improved work performance, meant that employees could take the online training at any time (usually just-in-time). There was no need to wait until enough new employees were available to have a critical mass of participants to make a classroom training program viable. Employees could do the training as soon as required and apply it immediately. This was of particular value in making new employees productive as quickly as possible or for training employees in areas that were new to them.

Because e-learning modules could be completed at an employee's regular workstation, when travelling or in remote offices, employees could take the training over an extended period of time and at their own pace, often utilising what otherwise would have been unproductive downtime. Not only did this allow learners to use their own time better, it also made it easier for their managers, who did not end up losing employees for whole days or longer when attending a training course. This simplified resource planning and workload balancing. The fact that employees could move through the modules at their own pace, repeat them as desired, and that training was often taken just-in-time followed by immediate application, led to a deeper level of learning.

It was the case in all the organisations reviewed, that the e-learning option did indeed better meet the needs of a dispersed workforce – par-

ticularly a globally dispersed workforce. In many of the organisations reviewed, particularly Qantas, it was the training challenges posed by a globally dispersed and highly mobile workforce that led them to become one of the early adopters of e-learning.

Barron (2002) suggests that e-learning is ideally suited to:

- Certification Driven Markets – where large numbers of learners need to be accredited to certain standards to achieve certification e. g. certification of Cisco and Microsoft Certified Engineers.
- Regulation driven markets – where large numbers of learners need to be kept up to date on regulations e. g. Westpac and ucc.
- Training intensive markets – where a lot of training is required as part of the normal operating environment or a given training course needs to be repeated frequently. This is the case in many technology industries.
- Multinational organisations – where a large dispersed workforce needs to be trained, preferably in a consistent manner.
- An effective e-learning system can effectively provide training customised to individual learners' needs and produce more even outcomes across a training population.

For example, Barker College, a private boys school in Sydney, Australia providing κ-12 education uses an e-learning system as a supplement to traditional learning. The system records learner responses and then uses this information to generate additional tasks, questions and exercises that it presents to the learner in order to develop weaknesses detected from previous responses.

Limitations of E-Learning

Turban (2004) discusses some of the drawbacks of e-learning.
Some of the key ones include:

- Lack of face-to-face interaction with a learning peer group,
- Equipment, software and support needs.
- Maintenance and updating of content.
- Program development costs.
- Learner drop out.
- Assessment i. e. guaranteeing that is was the actual intended learner who completed the assessment.

The lack of face-to-face interaction with a peer group can be a significant issue in a corporate environment depending on the objectives of the training. This may mean that e-learning will only be suitable for delivering certain types of training, and class room based training will continue to survive as an important forum for corporate learning. Each approach will find its suitable context. For example, many training programs delivered in corporate settings are focused on developing interpersonal skills, team skills, leadership – all topics which ideally will required contact with a training peer group as part of the learning process. In addition, many training activities have an underlying agenda such as team building and group bonding – again, requiring interaction with a peer group as part of the learning process.

The other issue revolves around the fact that many participants see the group interaction and discussion as a key facilitating process for their own learning.

The writer's own experience in teaching in a blended learning program at the Master's level, found that students were far more talkative and interactive, wishing to discuss and debate issues at greater length with the instructor as well as with other class mates during face-to-face sessions compared to students who were enrolled in the classroom-based option only. It seemed that the blending learning students almost craved the social interaction that comes from a classroom environment and were using the scheduled face-to-face sessions to overcompensate for what they were not getting online. It may be that some topics as well as some learners, may just not be suited to e-learning.

The issues of learner dropout and assessment guarantee, which Turban (2004) discusses with respect to open subscription e-learning programs, may not be such an issue in the corporate environment. The higher levels of learner accountability and supervisory direction and control associated with learning activities in a corporate environment would work against learner drop out and assessment identity uncertainty which may occur in uncontrolled public subscription environments.

The issue of costs has previously been addressed, with organisations such as Motorola noting that the initial set up costs were high, but benefits came in the form of lower delivery costs.

The development, updating and maintenance of content is a significant issue. Current practices by leading adopters of e-learning suggest that this will only be able to be done effectively by drawing on both externally sourced as well as internally developed content. This in turn will

create opportunities for third party organisations wishing to develop, supply, update and maintain content on e-learning systems on behalf of clients, such as is the case in the relationship between Hudson Learning Solutions and Qantas.

Comparisons and Conclusions

By comparing some of the major characteristics of the way e-learning has been implemented at each of the major case studies considered in this paper, we can identify some common themes that cut across all of the organisations as well as some significant points of difference. These include:

- A relatively large and dispersed workforce. In the cases of Qantas, Cisco and Motorola – globally dispersed, making traditional classroom-based training logistically difficult.
- All organisations used e-learning initially to deliver what could be best described as 'technical' content – product and technology knowledge, legislative knowledge and knowledge of company processes and procedures. In this respect, the e-learning system is in effect being used as a major element in the management and disbursement of organisational knowledge. Although there were stated intentions to do so, the writer did not observe management and interpersonal skills development content being effectively delivered by e-learning, at this point in time.
- In all cases, the e-learning programs offered were online versions of training previously (and in many cases still) offered offline.
- All organisations had built links back to Human Resource Management systems to keep track of courses completed, competencies, needs and gaps.
- In all cases, the e-learning functionality was available as a function in a company wide intranet – available everywhere, anytime. In the case of Cisco and Motorola e-learning was part of a comprehensive web-enabled corporate ɪт system.
- The initial focus of e-learning delivery was on internal employees, although Cisco and Motorola had deliberate strategies to roll this out to vendor partners.
- All companies report that the costs of implementing e-learning were 'significant'. The major cost benefits came by way of good scalability and repeated use of e-learning modules.

The most significant differences observed were mainly related to degree of commitment to e-learning and aggressiveness of implementation targets – with Motorola and Cisco projecting that the majority of their training requirements would be delivered in this manner. The other key difference was in the degree of outsourcing used. Qantas has chosen to outsource all aspects of providing the e-learning platform, while the other organisations retained this inhouse.

Finally, the key conclusions we can draw from the study reported in this paper are:

- Organisations are using e-learning as an increasing part of delivering on the training strategy.
- Organisations using e-learning are substituting E-Learning based delivery of training and content for what was previously classroom-based training.
- E-Learning is seen by many oganisations as a low risk E-Business initiative and can be used as a pilot to the deployment of more comprehensive business critical intranet or extranet portals.
- Many of the companies at the forefront of internet technologies e. g. Motorola and Cisco have been at the forefront of pursuing e-learning and have set aggressive targets for the proportion of overall training to be migrated to e-learning.
- There are real benefits to e-learning which suggest that in many training areas, it yields superior outcomes to classroom-based learning for the learner.
- There are real cost and productivity benefits for organisations from e-learning.
- E-learning is not universally applicable to all learning areas of interest to corporates.
- The cost of developing and implementing an e-learning platform is significant and offers opportunities for independent, third part organisations to develop and deliver this functionality to corporate clients (as is the case with Hudson Learning Solutions and Qantas).
- The significant effort required to develop, update, convert and maintain content suggests that externally sourced content and outsourced content management services will emerge as a key feature of effective corporate e-learning implementations, as was found in cases reviewed.

It would appear that e-learning has not only arrived, but is here to stay as a permanent feature of the corporate learning landscape in today's organisations, playing a role together with more traditional approaches to employee training and development.

It appears that e-learning offers organisations the opportunity to exploit 'Virtuous Circles' in the way they implement training and development activities (Hallowell 2002). That is, opportunities where the e-enablement of what was previously an offline activity allows organisations to achieve improved outcomes at lower costs.

In today's increasingly competitive and globalised business environment, e-learning is something organisations cannot afford to ignore.

Notes

1 The information was obtained from a conversation with John Pawalski, Manager at the Westpac Banking Corporation, Mortgage Processing Centre, in 1999.
2 The information was obtained from a conversation with Mark Keough, Chief Executive Officer of TechWorks, in 1995.

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